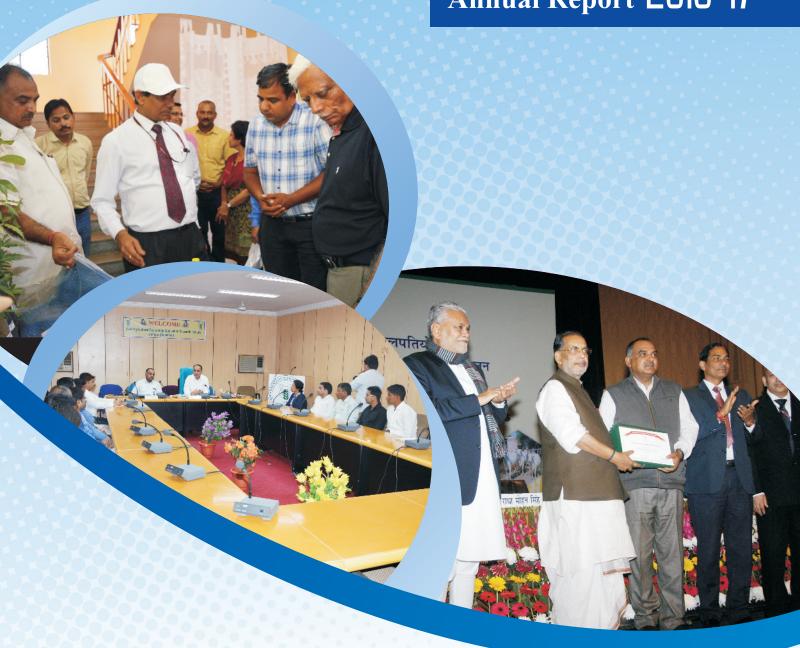
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ICAR-Agricultural Technology Application Research Institute भाकृअनुप—कृषि तकनीकी अनुप्रयोग संस्थान

(ISO 9001-2015)

(CAZRI Campus), Jodhpur-342 005, Rajasthan, India (काजरी परिसर), जोधपुर 342 005, राजस्थान, भारत

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Annual Report: 2016-17

ICAR-Agricultural Technology Application Research Institute

CAZRI Campus, Jodhpur - 342 005 Rajasthan, INDIA

Tel.: +91-291-2740516, Fax: 0291-2744367

E-mail: zpd6jodhpur@gmail.com Website: www.atarijodhpur.res.in

Guidance

Dr. A.K. Singh

Deputy Director General (Agril. Extn.)

ICAR, New Delhi

Published by

Dr. S.K. Singh

Director

Editorial Board

Dr. S.K. Singh Dr. M.S. Meena Dr. P.P. Rohilla Dr. R.B. Kale Shri P.K. Satapathy Shri Shayam Das

Secretarial Assistance

Ms. Aruna Sharma Shri Narpat Singh Gehlot Shri Permod Sharma Shri Bhawani Singh Inda

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PREFACE

A paradigm shift from 'crop alone' based farming to 'mixed farming' including crops, farm animals and fish farming suiting different agro-ecological regions now known by Integrated Farming System (IFS) is considered and promoted as the appropriate strategy. Indian farmers have practiced farming since ages in such combinations involving crops, farm animals and fish that would provide year round food and nutrition to their families, and feed to farm animals. The system somehow had lost its place of importance over the decades due to mono crop cultivation to reap high yields. There is growing realization that crop-alone based farming practice is becoming non-sustainable and only IFS would help to improve livelihood of farmers. ICAR and State Agricultural Universities have given serious research attention to design and develop agro-ecology based IFS models. Diverse modules have been systematically evaluated in the targeted agro-ecologies for income and ecological sustainability. Many non-government organizations and progressive farmers have also joined in this national effort to develop their own mixed-farming models. The challenge now is to convince and motivate farmers to switch over to these sustainable models. Ministry of Agriculture & Farmer Welfare, Government of India, New Delhi has launched "National Mission of Sustainable Agriculture" in the year 2014. 100 Krishi Vigyan Kendras have been identified to develop need based and resource affordable Integrated Farming System Model across the country during 2016-17 under National Mission on Sustainable Agriculture.

Krishi Vigyan Kendra (KVK) network, since its very beginning in 1974, has grown to strength of 676. The KVK has proved to be an important institution mechanism in the process of technology assessment and demonstration for its application and capacity development to facilitate the main extension system operated by the developmental



department in large scale dissemination of technology among the farmers. The activities of the KVKs should be not only knowledge intensive, effective and relevant in the line of various research innovations but also facilitating processing and value addition for converting produce into products and its marketing and trading. Providing knowledge and skill in totality is therefore a major challenge including exploring the huge potentiality of Information & Communication Technology for knowledge improvement and knowledge management.

Contribution of Rajasthan in food production and other allied sectors is well recognized with share of 40% in mustard, 40% pearlmillets, 80% in cluster bean, 95% in isabgol, 98% in Henna, 65% in coriander, Rajasthan is rated as first rank in the country. Besides this, Rajasthan is considered IInd rank in pulses and cumin, third rank in soybean, forth rank in maize and fifth rank in wheat. The year 2016-17especially rainy season was quite satisfactory and total rainfall reported during June to October 2016 is just double of average rainfall of almost regions including arid, semi-arid humid and sub-humid in Rajasthan. The diversified cropping pattern and the presence of livestock as a major livelihood sources has helped the state in managing the wide range of risk associated with dryland agriculture. Gujarat state is the largest producer of groundnut and castor in India and has contributed significantly in agricultural sector during last one decade. The credit goes to implementation of watershed development in Saurashtra and Kutch regions, adoption of Bt. Cotton, improved technological packages, emphasis on development and promotion of location specific technologies under different agro-ecological environment mainly related to cereals, oilseeds, pulses, horticultural crops, etc. Livestocks sector plays important role in achieving food, nutritional economical, social and environmental security in Gujarat. Reducing instability in agricultural production has been a major policy concern over the year since the stability and growth in agriculture are vital for providing food and nutrition security to burgeoning population of Rajasthan and Gujarat. In view of this, KVKs under ICAR-ATARI, Jodhpur have developed workplan and are in regular contact with different stakeholder (Line Departments) to address different issues for acceleration of growth, inclusiveness and reduction of poverty.

Coordination and monitoring of technology application and management of Extension Education programmes and strengthening agricultural extension research are the major mandates of ICAR-ATARI, therefore number of initiative have been executed, closely



coordinated and monitored. For achieving self sufficiency in pulses production in the country, a collaborative "Production of Quality Seeds of Indigenous Pulse Crops" under Seed Hub Project has been implemented by selected 14 KVKs (8 Rajasthan and 6 Gujarat). Under National Food Security Mission "Cluster Frontline Demonstration on Pulses" have been executed by 58 KVKs of Rajasthan and Gujarat. 12 Krishi Vigyan Kendras have been selected to establish Integrated Farming System Model under National Mission on Sustainable Agriculture. ICAR-ATARI, Jodhpur is actively involved in implementation of Skill Training courses (21 days each) by 17 KVKs (11 in Rajasthan and 6 in Gujarat). For increasing the production and productivity of oilseeds, Cluster Frontline Demonstrations on Oilseeds under National Mission on Oilseeds & Oil Palm (NMOOP) are conducted by KVKs. Attracting and Retaining Youth in Agriculture (ARYA) is a major initiative of ICAR to attract and empower the youth in rural areas to take up various agriculture and allied fields. The Mara Gaon Mera Gauray, an innovative initiative for creating awareness among farmers on agricultural technologies is being implemented through ICAR institutes and SAUs of Rajasthan and Gujarat. For enriching knowledge and integrating technology, ICAR commenced the Farmer FIRST programme within National Agricultural Research System. For measuring the effectiveness of the farmer to farmer (F2F) extension model, a project entitled "Effectiveness of Farmer-to-Farmer (F2F) Extension Model to Enhance he Technology Uptake in Rajasthan State" initiated in networking mode with KVKs under extra mural funding. National Initiative on Climate Resilient Agriculture (NICRA) is also being implemented through 10 KVKs of Rajasthan and Gujarat. Tribal Sub-Plan and other projects are also undertaken by the ICAR-ATARI.

I complement sincere thank to recipients of Best Zonal Pandit Deendayal Upadhyay Rashtriya Krishi Vigyan Protshahan Puraskar 2015 to KVK, Navsari and Best Zonal Pandit Deendayal Upadhyay Rashtriya Krishi Vigyan Protshahan Puraskar 2016 to KVK, Udaipur on the occasion of ICAR Foundation Day on 16.07.2016 and Krishi Unnati Mela on 15.03.2017 at New Delhi. I congratulate Progressive Farmer Sh. Kishan Suman of Kota District for receiving Jagjivan Ram Innovative Farmer Award (Zonal). I also congratulate Shri Hasam Bhai Jumabhai Masangara for receiving Pandit Deen Dayal Upadhyay Antyodaya Krishi Puruskar–2016 at Jodhpur on 25.09.2016.

I wish to express sincere thanks and gratitude to Dr. Trilochan Mohapatra, Secretary DARE and Director General, ICAR; Dr. A. K. Singh, Deputy Director General (Agril. Extn.);



Dr. V. P. Chahal and Dr. Randhir Singh ADGs (Agril. Extn.) and Scientific Staff/Administrative Staff of Division of agricultural Extension, ICAR, New Delhi for their full and utmost supports in achieving the targets. I also express thanks to Directors of Extension Educations and their staff for providing technological backstopping to KVKs and for ably coordinating and monitoring the KVKs activities. I complement Senior Scientist & Heads, Subject Matter Specialists and staff of KVKs & ATICs for systematically planning and implementing action plan and achieving targets for 2016-17. I express my deep sense of gratitude to all may colleagues of ICAR-ATARI, Jodhpur for providing excellent support, unstinted cooperation, achieving targets and putting in a lot of efforts for bringing out the annual report timely.

It is hoped that data and information provided in this report will be of immense use to researchers, administrators, policy makers, extension personnel, farmers and other stakeholders for devising policy, research and development projects.

Place : Jodhpur Date : July 10, 2017

S. K. Singh)

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कार्यकारी सारांश

कृषि तकनीकी अनुप्रयोगों के समन्वय एवं मूल्यांकन, अग्रणी प्रसार शिक्षण कार्यक्रम, कृषि प्रसार शोध को मजबूत करना एवं कृषि ज्ञान प्रबंधन, भाकृअनुप—कृषि तकनीकी अनुप्रयोग संस्थान के प्रमुख उदद्श्य है। कृषि प्रसार अनुसंधान को मतबूत बनाने के लिए राजस्थान एवं गुजरात में कृषि विज्ञान केन्द्रों के माध्यम से कई कदम उठाए गए हैं।

कृषि विज्ञान केन्द्र, अनुसंधान संस्थानों तथा किसानों के तकनीकी अपनाने के मध्य की दूरी को कम करने हेतू, फसल उत्पादन, उत्पादकता एवं कृषि और इसकी सहायक गतिविधियों से आय बढाने के लिए जिला स्तर पर विज्ञान एवं नवाचार केन्द्र के रूप में कार्य करता है। कृषि विज्ञान केन्द्र द्वारा 310 तकनीकों का आंकलन 2156 प्रक्षेत्र परीक्षणों के माध्यम से किया गया। उत्पादन के आंकडों और किसानों की प्रतिक्रिया प्राप्त करने के लिए कृषि एवं इससे संबंधित क्षेत्रों में स्थान विशिष्ट की नवनीनतम तकनीकों को प्रदर्शित करने के लिए प्रमुख फसलों तिलहन, दलहन, मसालों, सब्जियों, नकदी फसलों और बाजरा पर 26372 प्रथम पंक्ति प्रदर्शनों का आयोजन 9827.59 हेक्टेयर क्षेत्र में किया गया। इसके साथ ही मछली पालन (272), पशुपालन (1896), कृषि यन्त्रों पर (123) और अन्य गतिविधियों (325) पर प्रदर्शनों का सफल आयोजन किया गया। कृषि यन्त्रों पर किए प्रदर्शनों से यह ज्ञात हुआ कि ये कार्य करने में प्रभावी एवं इससे आय, समय और श्रम में बचत होती है।

भाकृअनुप—कृषि तकनीकी अनुप्रयोग संस्थान, जोधपुर के कृषि विज्ञान केन्द्रों द्वारा 4451 प्रशिक्षण कार्यक्रमों का आयोजन किया गया जिसमें 138573 किसानों, ग्रामीण युवाओं और विस्तार कार्यकत्ताओं ने भाग लिया। 4063 प्रशिक्षण कार्यक्रमों के आयोजन से 126431 कृषक / महिलाओं की दक्षता में वृद्धि हुई। इन कार्यक्रमों में 35.70 प्रतिशत पिछड़ी जाति / आदिवासी एवं 26.84 प्रतिशत महिला किसानों की भागीदारी रही। ग्रामीण युवाओं के लिए 220 एवं विस्तार कार्यकर्त्ताओं के लिए 168 आयोजित कार्यक्रमों में क्रमशः 6607 ग्रामीण युवा एवं 5535 विस्तार कार्यकत्ताओं ने भाग लिया। कृषि ज्ञान प्रबंध, जल प्रबंधन, जैविक खेती और मोबाइल सलाह सेवा पर विषय वस्तु विशेषज्ञों के ज्ञान एवं कौशल को बढ़ाने के लिए कृषि तकनीकी अनुप्रयोग संस्थान, जोधपुर एवं प्रसार शिक्षा निदेशकों द्वारा 36 मानव संसाधन गतिविधियों का आयोजन किया गया।

विस्तार गतिविधियों में प्रमुखतः किसान मेला (99), प्रक्षेत्र दिवस (671), किसान गोष्ठी (567), प्रदर्शनी (312), किसान कार्यशाला (171), समूह बैठकें (671), पूर्व—प्रशिक्षक बैठकें (45), शैक्षणिक भ्रमण (292), सलाहकार समिति, पशु चिकित्सा शिविर, नैदानिक भ्रमण, किसान—वैज्ञानिक वार्त्ता एवं विस्तार साहित्य, समाचार पत्रों, आकाशवाणी कार्यक्रम आदि के माध्यम से कुल 1458439 किसानों एवं 22833 विस्तार कार्यकर्त्ता लाभान्वित हुए। कृषि विज्ञान केन्द्रों द्वारा 36390 मोबाइल संदेशों द्वारा 5800248 किसानों को कृषि सलाह दी गई।

राजस्थान एवं गुजरात के कृषि विज्ञान केन्द्रों द्वारा कुल 53843 मृदा/जल/पौधों के नमूनों की जांच की गई, इसमें 43565 मृदा, 9799 जल एवं 290 पौधों के नमूने जो कि 3687 गाँवों के 101459 किसानों के लिए गए। विभिन्न फसलों के 18876.23 क्विंटल बीज, 6020809 पौध सामग्री क्रमशः 41476 एवं 23380 किसानों को उपलब्ध कराया गया। इसके साथ ही 213106.8 कि.ग्रा. जैविक उत्पादों और 15572 सन्तति पशुओं का विक्रय किसानों को किया गया। किसानों ने शैक्षणिक भ्रमण के दौरान कृषि प्रौद्योगिकी सूचना केन्द्रों से एकल खिड़की से



तकनीकी, बीज, पौध सामग्री आदि मूल्य सवंर्धित उत्पादों की जानकारी व उपलब्धता प्राप्त की गयी।

कुल 72 वैज्ञानिक सलाहाकार समिति की बैठकों का आयोजन मेजबानी संस्थानों द्वारा किया गया, जिसमें भाकृअनुप के संस्थानों, जिला स्तरीय विभागों, प्रगतिशील किसानों और महिला किसानें द्वारा कृषि विज्ञान केन्द्रों के कार्यक्रमों व गतिविधियों को क्षेत्र की परिस्थिति, उपलब्ध संसाधन व कृषकों की आवश्यकता के अनुरूप प्रशिक्षणों का आयोजन किये गये एवं इनके प्रभावी संचालन के बारे में सलाह दी गई। कुल खर्च रूपये 7825.22 लाख अवार्ती व अनावर्ती मद में वर्ष 2016—17 में किया गया।

तिलहन के उत्पादन और उत्पादकता में वृद्धि के लिए कृषि विज्ञान केन्द्रों द्वारा नेशनल मिशन ऑन ऑयल सीड्य एण्ड ऑयल पॉम के अंतर्गत तिलहनी फसलों पर (5202) प्रथम पंक्ति प्रदर्शनों का आयोजन किया गया। दलहन उत्पादन को बढ़ाने के लिए राष्ट्रीय खाद्य सुरक्षा मिशन के अतंर्गत दलहनी फसलों पर (7371) प्रथम पंक्ति प्रदर्शनों का आयोजन किया गया। भारतीय कृषि अनुसंधान द्वारा वित्त पोषित परियोजना आर्या का क्रियान्वयन कृषि विज्ञान केन्द्र बांसवाड़ा राजस्थान व राजकोट प्रथम (गुजरात) द्वारा नवयुवकों को कृषि आधारित व्यवसाय में स्वावलम्बी बनाकर टिकाऊ आमदनी प्राप्त कराने के उद्देश्य से किया जा रहा है। किसानों में कृषि तकनीकी की जागरूकता के लिए मेरा गाँव मेरा गौरव कार्यक्रम को प्रारंभ किया गया, जिसे राजस्थान व गुजरात के भाकुअनुप के संस्थानों एवं राज्य कृषि विश्वविद्यालयों द्वारा क्रियान्वित किया जा रहा है। किसानों तक ज्ञान को बढ़ाने एवं एकीकृत तकनीकी पहुँचाने के लिए भाकृअनुप द्वारा 'फार्मर फस्ट परियोजना' को राष्ट्रीय कृषि शोध प्रणाली के द्वारा क्रियान्वित किया जा रहा है। किसान से किसान विस्तार मॉडल की सफलता की प्रभाविता मापने के लिए "राजस्थान राज्य में कृषि तकनीकी को बढ़ावा देने के लिए कृषक से कृषक प्रणाली की प्रभावशीलता'' परियोजना एक्स्ट्रामूराल फंडिग के तहत 8 कृषि विज्ञान केन्द्रों के माध्यम से राजस्थान में क्रियान्वित की जा रही है। राजस्थान व गुजरात के 10 कृषि विज्ञान केन्द्रों द्वारा कृषि पर जलवायु परिवर्तन की राष्ट्रीय पहल (निकरा) को क्रियान्वित किया जा रहा है। जनजातीय उप योजना और अन्य कई परियोजनाओं का संचालन भाकृअनुप—कृषि तकनीकी अनुप्रयोग संस्थान, जोधपुर के समन्वय व वित्तीय सहयोग से 72 कृषि विज्ञान केन्द्रों द्वारा प्रभावी ढंग से किया जा रहा है।

भाकृअनुप-कृषि तकनीकी अनुप्रयोग संस्थान, जोधपुर ने राष्ट्रीय एवं अंतर्राष्ट्रीय संस्थानों से कार्यकारी संबंध स्थापित किये है इनमें राष्ट्रीय मत्स्य विकास बोर्ड, राष्ट्रीय कृषि एवं ग्रामीण विकास बैंक, अंतर्राष्ट्रीय अर्द्ध-शृष्क उष्णकटिबंधीय फसल अनुसंधान संस्थान, विज्ञान एवं प्रौद्योगिकी संस्थान, भारतीय किसान खाद निगम लिमिटेड, भारतीय खाद्य निगम, केन्द्रीय मीठा जल जीवन पालन अनुसंधान संस्थान, आकाशवाणी आदि प्रमुख है। संस्थान ने कृषि विज्ञान केन्द्रों की उपलब्धियों के मूल्यांकन के लिए वार्षिक क्षेत्रीय कार्यशाला का आयोजन 2-4 मई 2016 को आनंद कृषि विश्वविद्यालय, आनंद (गुजरात) में किया। राजस्थान व गुजरात के 72 कृषि विज्ञान केन्द्रों की गतिविधियों के मूल्यांकन के लिए, 6वीं संस्थान प्रबंधन समिति की बैठक 20 फरवरी, 2017 को निदेशक डॉ. एस.के. सिंह के निर्देशन में आयोजित की गई। संस्थान द्वारा राज्य स्तरीय कार्यशालाओं का आयोजन किया गया जिसमें राजस्थान राज्य के कृषि विज्ञान केन्द्रों के लिए दिनांक 7-8 दिसंबर, 2016 को वनस्थली विश्वविद्यालय, वनस्थली, टोंक (राजस्थान) में तथा गुजरात राज्य के कृषि विज्ञान केन्द्रों के लिए 30-31 दिंसबर, 2016 को सरदार कृषि नगर कृषि विश्वविद्यालय, दांतीवाड़ा (गुजरात) में किया गया।

युवाओं के गाँवों से शहरों की ओर हो रहे पलायन को रोकने के लिए 'आर्या' परियोजना का संचालन राजस्थान में बांसवाड़ा कृषि विज्ञान केन्द्र द्वारा तथा गुजरात में राजकोट कृषि विज्ञान केन्द्र द्वारा किया जा रहा



है। इस परियोजना का मुख्य उदेश्य ग्रामीण स्तर पर रोजगार के अवसर पैदा करना है। इस परियोजना में मुर्गीपालन, नर्सरी प्रबंधन (फल एवं सब्जी), बकरी पालन और मूल्य सर्वर्धन की इकाईयों को सम्मिलित किया गया है। 2022 तक किसानों की आय को दुगुना करने के लिए समन्वित कृषि प्रणाली और दो या उससे अधिक अवयवों की सहभागिता सहयोग से उत्पादकता और आय को सतत् और पर्यावरण अनुकूल बनाना मुख्यतः लघु किसानों के लिए यह प्रणाली सबसे अच्छा विकल्प है। आवश्यकता आधारित , संसाधन किफायती और किसानों द्वारा धारित की जानी वाली समन्वित कृषि प्रणाली का निर्माण विभिन्न कृषि विज्ञान केन्द्रों और किसानों के प्रक्षेत्रों पर किया गया है। पशुपालन पर आधारित समन्वित कृषि प्रणालियों की स्थापना पर ज्यादा जोर दिया गया है। किसानों के लिए कृषि कौशल प्रशिक्षण के संबंध में वर्ष 2016-17 में 17 कृषि विज्ञान केन्द्रों का चयन किसानों और युवाओं को रोजगारन्मुखी प्रशिक्षण देने के लिए किया गया। वर्ष 2016-17 में कौशल विकास एवं उद्यमिता मंत्रालय के सहयोग से 7–9 नवंबर, 2016 को तीन दिवसीय प्रशिक्षण का आयोजन भाकृअनुप-कृषि तकनीकी अनुप्रयोग संस्थान, जोधपुर में किया गया। इसमें भारतीय कृषि कौशल परिषद के सदस्यों ने भी कौशल आधारित प्रशिक्षण को अंतिम रूप देने में अपनी भागीदारी को निभाया। कुल 34 कौशल आधारित स्वरोजगार उत्पन्न करने वाले प्रशिक्षण कार्यक्रमों का आयोजन किया गया जिसमें 600 अधिक ग्रामीण युवाओं को बागवानी, डेयरी, मधुमक्खीपालन, मुर्गीपालन और कृषि प्रसार कर्मी आदि क्षेत्रों में प्रशिक्षित किया गया। जिला स्तर पर किसानों की पसंदीदा किस्मों के बीज की उपलब्धता को सुनिश्चित करने के लिए एक सहयोगी परियोजना (स्वदेशी दालों के बीज का उत्पादन) जून, 2016 में किया गया। इसके तहत

14 सीड हब्ब भारत सरकार के कृषि एवं किसान मंत्रालय, नई दिल्ली के वित्तीय सहयोग से स्वीकृत किये गये जिसमें राजस्थान के 8 व गुजरात के 6 कृषि विज्ञान केन्द्रों को यह सीड हब्ब दिये गये हैं। प्रत्येक सीड हब्ब के लिए 1.5 करोड़ रूपये स्वीकृत किये गये। वर्ष 2016-17 में चना, मूंग, उड़द और अरहर की किसानों द्वारा पंसद की जाने वाली किस्मों का 3000 क्विंटल से अधिक बीज का उत्पादन किया गया। गुणवत्तायुक्त बीज उपलब्धता के लिए भण्डारण गृह, कटाई उपरांत काम में आने वाली मशीनों को प्रत्येक सीड हब्ब में स्थापित किया गया। राजस्थान में झुंझुनु, कोटा, उदयपुर, अलवर, बूंदी, झालावाड़ और नागौर तथा गुजरात में नवसारी, टाँपी, खेड़ा, राजकोट, पंचमहल और दाहोद कृषि विज्ञान केन्द्रों का चयन सीड हब्ब के रूप में किया गया है। प्रधानमंत्री फसल बीमा योजना के बारे में किसानों के मध्य जागरूकता पैदा करने के लिए राजस्थान और गुजरात के 60 कृषि विज्ञान केन्द्रों द्वारा 30 मार्च से 15 अप्रैल, 2016 तक जागरूगता कार्यक्रमों का आयोजन किया गया जिसमें 41145 किसानों ने भाग लिया। इन कार्यक्रमों में प्रधानमंत्री फसल बीमा योजना से संबंधित पत्रकों का वितरण किसानों को किया गया तथा इसके साथ इससे संबंधित फिल्मों का प्रदर्शन भी इन कार्यक्रमों में किया गया। इन जागरूकता कार्यक्रमों भारत सरकार के सांसदों, राजस्थान व गुजरात सरकार के विधायकों ने भी भाग लिया। इसके साथ ही बैंक कर्मचारियों, निजी कंपनियों, बीमा प्रदाताओं आदि ने भी सक्रिय रूप से अपनी भागीदारी सुनिश्चित की। स्वच्छता अभियान पखवाडा व हिन्दी पखवाडा के आयोजन समय-समय पर कृषि तकनीकी अनुप्रयोग संस्थान, जोधपुर व कृषि विज्ञान केन्द्रों द्वारा किए गए।



EXECUTIVE SUMMARY

ICAR-ATARI is mandated with coordination & monitoring of technology application and front line extension education programmes and strengthening agricultural extension research and knowledge management. For strengthening agricultural extension research, institute has taken a number of initiatives in networking mode with KVKs in Rajasthan and Gujarat.

As an innovative and district level farm science center, KVKs have reduced time lag between generation of technology at research institutions and its transfer to farmers' fields for increasing production, productivity and income from agriculture and allied sectors. Now mandate of KVK is technology assessment and demonstration for its application & capacity development. The mission of KVK is science & technology led growth for enhanced productivity, profitability & sustainability. With active collaboration and coorditation of ICAR-ATARI, Jodhpur. KVKs executed mandated and other sponsored programmes and activities in a participatory mode. On-farm testing on 310 technologies through 2156 trials were organized. To demonstrate the proven production potentials of latest location specific technologies in agriculture and allied areas for generating production data and obtaining feedback, 26372 FLDs covering 9827.59 ha area on major crops of oilseeds, pulses, cereals, vegetables, cash crops and millet were carried out. In addition to FLDs on crops, demonstrations on fishery (272), dairy (1896), farm implements (123) and others (325) were successfully conducted. Farm implements were also found to be effective in drudgery reduction, and saving in cost, time and labour.

KVKs of Rajasthan and Gujarat organized 4451 training, in which 138573 farmers, rural youths and extension functionaries participated. From organization of 4063 trainings, 126431 practicing farmer's/farm women enhanced the skills. The participation of scheduled castes/tribes and farm women was noted as 35.70 per cent and 26.84 per cent, respectively. Training conducted for rural youths and extension functionaries were 220 and 168 through which 6607 rural youth, 5535 extension functionaries, respectively, got benefited. ICAR-ATARI, Jodhpur and Directorates of Extension Education (SAUs) had conducted 36 human resource development activities for subject matter specialists from different KVKs to enrich their knowledge and skills on agricultural knowledge management, watershed management, organic farming and mobile advisory services, etc.

The major extension activities namely, kisan mela (99), field days (671), kisan gosthies (567), exhibitions (312), farmers seminar/workshop (171), method demonstration (863), group meetings (671), ex-trainee samellan (45), exposure visits (292), advisory services, animal camps, diagnostic visits, interactions, extension literature, print media coverage, broadcasting in electronic media were conducted in which a total of 1458439 farmers and 22833 extension personnel participated. KVKs have provided agro-advisory services through 36390 SMS to 5800248 farmers.



A total of 53843 samples comprising 43565 soils, 9799 water and 290 plants of 101459 farmers inhabiting 3687 villages were tested by KVKs of Rajasthan and Gujarat. A total of 18876.235 q seeds of different crops and 6020809 planting materials were sold to 41476 and 23380 farmers, respectively. In addition to that 213106.8 kg bio-products and 15572 progeny animals and poultry were also produced and sold to farmers. Agricultural Technology Information Centres have followed single window delivery and provided technologies, information, seeds, planting materials and value added products to visiting farmers.

In seventy-two scientific advisory committee meetings comprising representatives from host institutes, ICAR institutes, district line departments, progressive farmers and farm women had provided advisory for proper functioning of the KVKs in the zone. A total of Rs. 7825.22 lakhs fund was utilized in recurring and non-recurring heads for the zone.

For increasing production & productivity of oilseeds, Cluster Frontline Demonstrations on Oilseeds (5202) under National Mission on Oilseeds & Oil Palm (NMOOP) have been conducted by KVKs. Promotional efforts in form of cluster demonstrations on pulses (7371) have been carried out under National Food Security Mission (NFSM). Mera Gaon Mera Gauray, an innovative initiative for creating awareness among farmers on agricultural technologies is being implemented through ICAR institutes and SAUs of Rajasthan and Gujarat. For enriching knowledge and integrating technology, ICAR commenced the Farmer FIRST programme within National Agricultural Research System. For measuring the effectiveness of Farmer to Farmer (F2F) extension model, a project entitled "Effectiveness of Farmer-to-Farmer (F2F) Extension Model to Enhance Technology Uptake in Rajasthan State" has been initiated in networking mode with KVKs under extra mural funding. National Initiative on Climate Resilient Agriculture (NICRA) is also being implemented through 10 KVKs of Rajasthan and Gujarat. Tribal Sub Plan and other projects are also taken up by ICAR-ATARI, Jodhpur.

ICAR-ATARI established linkages with national as well as international institutes viz., National Fisheries Development Board, National Institute of Agricultural Extension Management, International Crop Research Institute for Semi-Arid Tropics, Department of Science and Technology, Indian Farmers Fertilizers Cooperative Limited, Food Corporation of India, Central Institute Freshwater Aquaculture, All India Radio and other organizations. Annual Zonal Workshop was organized at AAU, Anand during 2-4 May, 2016 to review the achievements of KVKs for the year 2015-16. To discuss and finalize Annual Action Plans of KVKs, State Level Mid Review and Planning Workshops have been organised during 7-8 December, 2016 at Banasthali University, Banasthali, Tonk (Rajasthan) and during 30-31 December, 2016 at SDAU, Dantiwada (Gujarat) for Rajasthan and Gujarat KVKs respectively. Institute also organized 6th Institute Management Committee meeting at ICAR-ATARI, Jodhpur on 20th February, 2017 under the Chairmanship of Dr. S.K. Singh.

For strengthening agricultural extension research, various initiatives have been taken up by KVKs of Rajasthan and Gujarat which includes Attracting and Retaining Youth in Agriculture (ARYA), Demonstration of Climate Resilient Integrated Farming System (IFS) through KVK, Promotion of Sustainable



Livelihoods through Skill Development of Farmers, NICRA, CIWA, Farmer FIRST programme, Mera Gaon Mera Gaurav, Protection of Plant Varieties and Farmers Right Act (PPV&FRA), Seed Hub, Post Office Linkage Extension Model, etc.

In order to reduce the migration from rural areas to urban areas ARYA project is being implemented in Banswara in Rajasthan and Rajkot-I in Gujarat. The major objectives of ARYA project are to achieve gainful employment and sustainable income at village level. Major enterprises covered in the project are poultry farming, nursery management (vegetable and fruits), goat rearing and value addition. In order to double the farmers' income by 2022, the best option is the Integrated Farming System (IFS) model and to synergise interrelated effect of two or more components to enhance productivity and income in sustainable and environment friendly way especially for small and marginal farmers. Need based resource affordable and farmer acceptable IFS models have been developed at different KVKs and farmers' fields. More emphasis is being given to establishment of livestock based IFS models. In respect of Agriculture Skill Training for farmers a total 17 KVKs have been identified to impart employment oriented trainings to farmers and rural youth during 2016-17 with collaboration of Ministry of Skill Development & Entrepreneurship, Government of India, New Delhi a three days training programme was organized during 7-9 November, 2017 at ICAR-ATARI, Jodhpur. Agriculture Skill Council of India took active part in finalization of skill based training courses. Total 34 skill based self-employment oriented trainings haven organised in which more than 600 rural youth have been trained in areas of horticulture, dairy, bee keeping, poultry,

hatchery, agriculture extension worker, etc. To ensure availability of quality seeds of farmers preferred varieties at district levels, a collaborative project (Production of seeds of indigenous pulses) has been sanctioned in June, 2016. Total 14 seed hubs have been sanctioned including 8 in Rajasthan and 6 in Gujarat with a fund allocation of Rs.1.5 crore for each KVK. More than 3000 quintal seeds of Chickpea, Moong bean, Urdbean and Pigeon pea of farmer preferred varieties have been produced during 2016-17. To ensure the availability of the quality seed, storage structures and post harvesting machines have been established at each seed hub. KVK-Jhunjhunu, Kota, Udaipur, Alwar-I, Bundi, Jhalawar, Nagaur-I and Ajmer of Rajasthan; KVK-Navsari, Tapi, Kheda, Rajkot-I, Panchmahal and Dahod of gujaat are major seed hub centres. To create awareness about Pradhan Mantri Fasal Bima Yojana 60 KVKs of Rajasthan and Gujarat organised awareness programmes during 30 March to 15 April, 2016 in which 41145 farmers actively participated. In the programme leaflets on PMFBY were distributed, films on PMFBY were shown in the presence of Public Representatives viz., Central and State Ministers of Government of India and Rajasthan & Gujarat, MPs, MLAs, Bank Officials, Private Companies and Input Dealers, etc. ERP system is followed to comply relevant information related to project, administration and finance through on-line. Major emphasis is given on cashless transactions to make transparent system with active involvement of KVKs. Swachhata Pakhwara(s) have been organized on regular basis at ICAR-ATARI and KVKs. Hindi Pakhwara was celebrated during 14-30 September 2016 at ICAR-ATARI Jodhpur. KVKs actively involved in updating and uploading of information on KVK portal.





ICAR-ATARI - An Introduction

ICAR-ATARI, Jodhpur is functioning under Division of Agricultural Extension which is one of the 8 divisions of Indian Council of Agricultural Research (ICAR), New Delhi. The major activities of Agricultural Extension Division are assessment and demonstration of technology I products through a network of 669 Krishi Vigyan Kendras (KVKs). Agricultural Extension division is headed by Deputy Director General (Agricultural Extension) supported by two Assistant Director Generals. Extension Division has established the network of 669 Krishi Vigyan Kendras all over the country under administrative control of various ICAR Institutes, State Agricultural Universities, State Department of Agriculture and NGOs with the aim to asses and demonstrate technologies in agriculture and allied sectors. The Agricultural Extension Division at ICAR level monitors the progress of KVKs through its eleven ATARIs located across the country. The thrust areas of Agricultural Extension division are:

- Assessment and demonstration of technology/products
- Training of practising farmers and vocational training for rural youth
- Training of extension personnel
- Single window delivery system for

- technology products, diagnostic services and information through Agricultural Technology Information Centres
- Development of gender-specific technologies, and
- Creating awareness of improved agricultural technologies among the farmers

1.1 Genesis of ICAR-ATARI

The ICAR, New Delhi established Eight Zonal Coordinating Units in September 1979 to monitor and coordinate Lab to Land Programme (LLP) which was launched in 1979 on the occasion of ICAR's Golden Jubilee Celebration. To begin with Zonal Coordinating Units, Zone-VI had its office at Ahmadabad but was subsequently shifted to CAZRI Campus Jodhpur in September 1991. The jurisdiction Zone-VI included Rajasthan, Gujarat and Daman & Diu and Dadra & Nagar Haveli. Rajasthan and Gujarat occupies 60% 20% of hot arid region, respectively in the country (75% of arid and semi arid region). Various Research Institutions of ICAR and SAUs are catering the needs of the arid and semi-arid parts of both the states. ICAR-ATARI, Zone-VI, therefore, regularly established for these two states to address the problems in hot arid and semi-arid regions. The



unit was converted as a plan scheme with additional staff in 1986 and additional objective of monitoring other Transfer of Technology (ToT) Project of ICAR viz, KVK, Trainers Training Centre (TTC), National Demonstration Scheme (NSD), Operational Research Project (ORP), Scheduled Caste and Scheduled Tribe Project and Special Project on Oilseed. During 1990-91 another objective for implementing and monitoring the National Pulse Project was added. At this juncture, during XI Five Year Plan (2009), Zonal Coordinating Units were upgraded to Zonal Project Directorates and Zonal Coordinators were re-designated Zonal Directors with Project financial and administrative powers akin to other ICAR institutes. ICAR has upgraded all the eight Zonal Coordination Units to the status of Directorates and thus Zonal Project Directorate

(ZPD), Zone-VI came into existence during the year 2009. During the XII plan Zonal Project Directorate has been renamed as ICAR-ATARI (Agricultural Technology Application Research Institute) with research as one of the major components.

Mandate of ATARI

- Coordination and monitoring of technology application and front line extension education programs.
- Strengthening agricultural extension research and knowledge management

1.2 Organizational Structure of ICAR-ATARI

The organizational structure of ICAR-ATARI, Zone-VI, Jodhpur and KVK functioning in Zone is depicted in Fig 1.1.

Director General, Indian Council of Agricultural Research

Deputy Director General (Agricultural Extension)

Assistant Director General (Agricultural Extension)

Director, ICAR-ATARI, Zone-VI, Jodhpur

Rajasthan

Gujarat

Director Extension Education: State Agricultural Universities

Director: ICAR Institutes

Chairman / Secretary: Non-Governmental Organizations and other Institutes

Senior Scientist & Head, Krishi Vigyan Kendra

Fig 1.1 Organizational structure of ICAR-ATARI, Zone-VI, Jodhpur



1.3 KVKs functioning under ICAR-ATARI, Jodhpur

A total of 72 KVKs are functioning in ICAR-ATARI, Jodhpur. In Rajasthan, 42 KVKs are working while 30 KVKs are functioning in Gujarat state for the betterment of the farming community (Table 1.2)

Table 1.2 KVKs under ICAR-ATAIR, Jodhpur

| State Number | | | KV | Total | | |
|--------------|------------|------|------|-------|--------|----|
| | of KVKs | SAUs | NGOs | ICAR | Others | |
| Rajasthan | 42 | 34 | 3 | 3 | 2 | 42 |
| Gujarat | 30 | 17 | 8 | 2 | 3 | 30 |
| Total | 72 | 51 | 11 | 5 | 5 | 72 |

1.4 Workshop/Meeting/Conference/ Trainings Organized

Annual Review Workshop of NICRA KVKs of Rajasthan and Gujarat States was organized on 16th April, 2016; in which APR of 2015-16 was presented by KVK Heads and the Action Plan for 2016-17 was finalized.

Meeting of Zonal Project Management Committee (ZPMC) experts was organized at ATARI Jodhpur on 22nd April, 2016 to screen the project proposals received under Farmers FIRST Project (FFP) from SAUs/ICAR institutes under Zone-VI.

TSP & ARYA meeting conducted on 30 May, 2016 for the KVK of Rajasthan and Gujarat.

Swatch Bharat Pakhwada was celebrated at ATARI, Jodhpur during 16th May to 31st May, 2016.

Annual Zonal Workshop for KVKs of Rajasthan and Gujarat states was organised by ICAR-ATARI, Jodhpur at Anand Agricultural University at Anand (Gujarat) during 2-4 May, 2016. Directors from five ICAR institutes i.e., IIPR, Kanpur, CIAH, Bikaner, DGR, Junagadh, DRMR, Bharatpur, and NRCSS, Ajmer actively participated and gave presentations on showcasing the agricultural technologies suited to KVKs of the region. Seventy One KVKs and 11 Directors of Extension Education (DEEs) from State Agricultural Universities (SAUs) participated and presented the achievements of KVKs. Director, Research & other staffs of AAU, Anand and ICAR-ATARI, Jodhpur also participated in the workshop.



International Yoga Day was celebrated on 21st June, 2016 at ICAR-ATARI, Jodhpur. Scientists and Staff of the institute actively





participated in the practice of yoga exercises with the help of step by step instructions given by Yoga experts invited from Patanjali Yogpith Jodhpur during the celebration.

ICAR-ATARI, Jodhpur organised a two-days training programme for Nodal Officers of KVKs under National Mission on Oilseeds & Oil Palm (NMOOP) during 29-30th July 2016. Dr. I.Y.L.N. Murthy, Director, ICAR-IIOR, Hyderabad, Chief Guest of the event. About 20 Nodal Officers from KVKs of Rajasthan and Gujarat participated in the training programme.



Training on Oilseeds Production Technology for Rajasthan and Gujarat under NMOOP

A review and planning meeting of nodal officers from KVKs of Rajasthan and Gujarat under IARI-ATARI Collaborative Project "IARI



Review Meeting of IARI Post Office Linkage Extension Model

Post Office Linkage Extension Model" was organised by ICAR-Agricultural Technology Application Research Institute (ATARI), Jodhpur on 31st August 2016.

A review & planning meeting of nodal officers of KVKs of Rajasthan and Gujarat was convened by the ICAR-ATARI, Jodhpur on 7th September 2016 to review the Seed Hub Project.



Review meeting of Seed Hub Project

The award ceremony of Pandit Deen Dayal Upadhyay Antyodaya Krishi Puruskar–2016 was jointly organized by ICAR- ATARI, Jodhpur & Agricultural University (AU), on 25th September 2016 Jodhpur at AU Jodhpur. Shri Hasam Bhai Jumabhai Masangarahas been awarded with Pandit Deen Dayal Upadhyay Antyodaya Krishi Puruskar–2016 for his remarkably contribution in the production of





Lobster Fish adopting Sea Cage Fish Farming Technology. In addition to zonal award, six more innovative farmers have also been honored during the programme.

A Two days' Zonal Workshop-cumtraining programme on Production Technology of Pulse Crops for 57 KVKs of Rajasthan and Gujarat states was organised by ICAR-ATARI, Jodhpur at ICAR-CAZRI, Jodhpur (Rajasthan) during 24-25th October, 2016. Resource persons from IIPR, Panpur (UP) RARI, Durgapura, Jaipur, AU and CAZRI, Jodhpur (Rajasthan) took active participation.



Zonal Workshop-cum-Training on Production Technology of Pulse Crops

Stone Laying Ceremony was organized at KrishiVigyan Kendra, Morbi (Village: GorKhijadia) on October 27, 2016 in presence of Shri Parsottambhai Rupala, Hon'ble Minister (State), Agriculture and Farmer's Welfare, Gol, New Delhi, Shri Mohanbhai Kundariya, MP and Ex. Minister (State), Agriculture and Cooperation, Gol, New Delhi, Shri Chimanbhai Saparia, Hon'ble Minister, Agriculture and Energy, Gujarat state, Shri Dr. A.K. Singh, Deputy Director General (Agri. Ext.), ICAR, New Delhi, Dr. A.R. Pathak, Hon'ble Vice Chancellor, Junagadh Agricultural University,

Junagadh, Shri BavanjibhaiMetalia, MLA, Tankara, Shri Kantilal Amrutiya, MLA, Morbi. Dr. S.K. Singh, Director, ATARI- ICAR, Jodhpur.

Organized Zonal Committee Meeting of 'Attracting & Retaining Youth in Agriculture' (ARYA) to review the progress and action plan of KVKs (Banswara & Rajkot-I) on 21st November, 2016



ARYA Zonal Committee Meeting

Orientation Training Programme for KVK's Trainers under Skill Development Programme for Master Trainers of 24 KVKs from Rajasthan, Gujarat, Uttar Pradesh and Haryana is being organised in collaboration with Agricultural Skill Council of India (ASCI) by ICAR- ATARI, Jodhpur during 07-09 November 2016.



Orientation Training for KVK's Trainers under Skill Development Programme



Review & Planning meeting for Krishi Vigyan Kendras (KVKs) on extramural project (Effectiveness of farmer to farmer Extension model to enhance the technology uptake in Rajasthan state) was organized at ICAR-ATARI, Jodhpur on 10th November, 2016.

A Zonal Group Meeting was held under Farmers FIRST Programme on 8.11.2016 at ICAR-ATARI, Jodhpur under the Chairmanship of Dr VP Chahal, ADG (AE), ICAR New Delhi.

The Zonal Project Management Committee (ZPMC) meeting of the members under Farmers FIRST Project (FFP) was held at ATARI, Jodhpur on 18.11.2016 to screen the project proposals received from different institutes under Zone-VI.

Zonal Committee Meeting of 'Attracting & Retaining Youth in Agriculture' (ARYA) project was held to review the progress and action plan of KVKs under the Chairmanship of Dr. S. K. Singh, Director, ICAR-ATARI, Jodhpur on 21st November, 2016.

Mid Review meeting of NICRA KVKs of Rajasthan and Gujarat States was organized at ICAR- ATARI, Jodhpur on 17th November, 2016; in which six-months APR of 2016-17 and the Action Plan for next six months of 2016-17 from KVKs was discussed.

Two days' Sate level Mid Review and Planning Workshop for KVKs of Rajasthan was organised during 07-08 Dec., 2016 by ICAR-ATARI, Jodhpur at Banasthali Vidyapith, Tonk, Rajasthan. Forty two KVKs and five Directors of Extension Education (DEEs) from State

Agricultural Universities (SAUs) have actively participated in which the progress report of 2016 and Annual Action Plan for the year 2017-18 was discussed and finalized.



Two days' Sate level Mid Review and Planning Workshop for KVKs of Gujarat was organised during 30-31 Dec., 2016 by ICAR-ATARI, Jodhpur at SDAU, Dantiwada, Gujarat. 30 KVKs and four Directors of Extension Education (DEEs) from State Agricultural Universities (SAUs) of Gujarat were actively participated in which Annual Action Plan for the year 2017-18 was discussed and finalized.



Organised training programme for Nodal Officers of Krishi Vigyan Kendras under National Mission on Oilseeds & Oil Palm (NMOOP) during 27-28th February, 2017 at ICAR-ATARI, Jodhpur





Training programme for Nodal Officers of Krishi Vigyan Kendras under National Mission on Oilseeds & Oil Palm (NMOOP)

Organized one day interactive meeting for DEEs and Comptrollers of SAUs of Rajasthan and Gujarat was held at ICAR-ATARI, Jodhpur on 22nd February, 2017

Organised Institute Management Committee (IMC) of ICAR-ATARI, Jodhpur was held on 20.02.2017.

ICAR-ATARI, Jodhpur organised a two-days training programme for Nodal Officers of Krishi Vigyan Kendras under National Mission on Oilseeds & Oil Palm (NMOOP) during 27-28th January 2017 in which a total of 20 Nodal Officers from KVKs of Rajasthan and Gujarat were participated.



Training programme for Nodal Officers of Krishi Vigyan Kendras under National Mission on Oilseeds & Oil Palm (NMOOP)

A review-cum-planning meeting of nodal officers of KVKs of Rajasthan and Gujarat has been convened by the ICAR-ATARI, Jodhpur on 6th March, 2017 to review the Seed Hub Project. Hon'ble DDG, (Agricultural Extension) Dr. A. K. Singh, was the chief guest of the meeting. The nodal officers of 14 KVKs participated in the meeting and presented the activities undertaken under the seed hub project.



Review meeting of Seed Hub Project

Zonal Review Meeting of PIs and CO-PIs of ICAR Institutes (CAZRI, CSWRI) and SAUs (AU, Jodhpur, JASU Junagadh, NAU Navsari) under Farmers FIRST (FFP) was organized on 8th March, 2017 for at ICAR-ATARI, Jodhpur.



Review & Planning meeting of Farmer FIRST

A Group Meeting was organised during 29-30th March, 2017 for Nodal Officers from KVKs for Cluster Demonstrations on Pulses



under National Food Security Mission (NFSM) at ICAR- ATARI, Jodhpur (Rajasthan). Nodal officers of 30 KVKs from Rajasthan and Gujarat states have been invited to participate in this Group Meeting.



Group Meeting of Pulses

Sensitization Workshop on 'Protection of Plant Varieties and Farmer's Rights Act, 2001' for nodal officers of KVKs of Rajasthan and Gujarat is inaugurated at ICAR-ATARI, Jodhpur on 9th March, 2017. The nodal officers of 34 KVKs have participated in the workshop.

1.5 Awards/Rewards/Recognition

Dr. R. B. Kale received Gold Medal and Best Thesis Award (Management Group) 2017 for best dissertation work during PhD at National Dairy Research Institute, Karnal India on 4th March, 2017.

Award for cashless/digital transactions has been conferred to KVKs of ATARI, Jodhpur on 14.02.2017.





CHAPTER 2

RAINFALL PATTERN AND DROUGHT MITIGATION

Drought is one of the major constraints affecting food security and livelihoods of more than two billion people that reside on dry area, constitute 41% of the world's land surface. Since, drought is the deficiency of precipitation over an extended period of time resulting in water scarcity hence our efforts should be concentrated where the greatest challenges lie today. The emphasis must be on new solutions to cope up with the challenges facing dry areas particularly drought and water scarcity. Drought is a climatic event that cannot be prevented, but interventions and preparedness to drought can help to: (i) be better prepared to cope with

drought; (ii) develop more resilient ecosystems (iii) improve resilience to recover from drought; and (iv) mitigate the impact of droughts. Coping with drought and water scarcity are critical to address major development challenges in dry areas viz., poverty, hunger, environmental degradation and social conflict. A detailed account of rainfall occured in all districts of the Rajasthan and Gujarat during the monsoon 2016 has been compiled. From these data, average rainfall of Rajasthan and Gujarat for the monsoon period has been calculated and is presented in Fig.2.1 and Fig.2.2 respectively.

Average Rainfall During Monsoon 2016 in Rajasthan

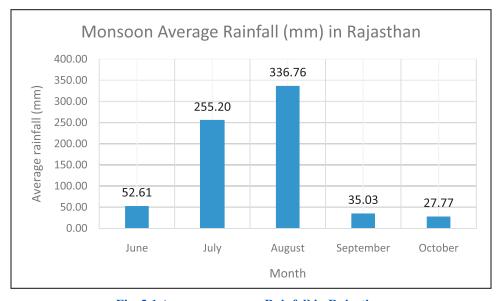
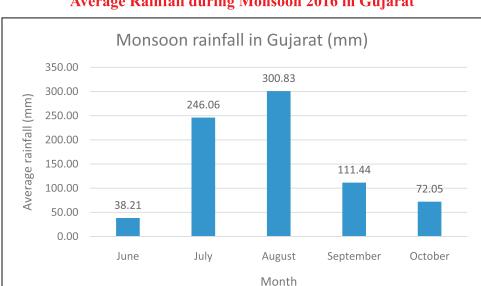


Fig. 2.1 Average monsoon Rainfall in Rajasthan





Average Rainfall during Monsoon 2016 in Gujarat

Fig. 2.2 Average Monsoon Rainfall in Gujarat

Rainfall Pattern and Agricultural Status in Rajasthan and Gujarat during 2016

The rainfall in Rajasthan and Gujarat during 2016 is given in table 2.1. On the whole western Rajasthan received excess rainfall and in east Rajasthan the rainfall was almost normal in 2016. Gujarat Region received less rainfall than normal and in Saurashtra & Kutch the rainfall was excess over and above normal rainfall.

Intervention on Aberrant Weather Condition

KVKs of the both states are actively involved to search out a way for mitigating aberrant weather condition for sustainable development of agriculture. Various activities undertaken for the mitigation of aberrant weather conditon by the KVKs are given below.

Introduction of Alternate Crops/Varieties

KVKs have identified and introduced alternate varieties of different crops to reduce adverse effect of drought on productivity of crops, vegetables, fodders, etc. in Rajasthan and Gujarat states. In both states, total of 13270 ha area have been covered under these varieties during year and 9402 farmers have taken advantage of these varieties.

State wise details of crops and their varieties are given in the table 2.2. More area covered (ha.) and farmers benefited (farmers) in Rajasthan than Gujarat (1500 ha area & 1600 farmers).

Table 2.1 Average Rainfall in mm during monsoon 2016 in Rajasthan and Gujarat

| State | June | July | August | September | October |
|-----------|-------|--------|--------|-----------|---------|
| Rajasthan | 52.61 | 255.20 | 336.76 | 35.03 | 27.77 |
| Gujarat | 38.21 | 246.06 | 300.83 | 111.44 | 72.05 |



| Table 2.2 introduction to Atternate Crops, varieties by KvKs | | | | | | |
|--|-------------------------------|-----------|-------------------|--|--|--|
| Crops/ cultivars | Variety | Area (ha) | Number of farmers | | | |
| | Rajasthan | | | | | |
| Black gram | PU-31, Azad-3 | 356.00 | 286 | | | |
| Cluster bean | RGC-1017 | 30.00 | 25 | | | |
| Cumin | GC-4 | 20.00 | 9 | | | |
| Green gram | GM-4, Meha, IPM 02-3, RMG-492 | 525.00 | 377 | | | |
| Isabgol | RI-1, RI-89 | 800.00 | 532 | | | |
| Lentil | IPL-406 | 109.00 | 125 | | | |
| Moth bean | RMO-257, RMO-435 | 30.00 | 23 | | | |
| Mustard Giriraj, NRCHB-101, PM-26, PM-28, CS-52 | | 9900.00 | 6425 | | | |
| Rajasthan Total | | 11770.00 | 7802 | | | |
| Gujarat | | | | | | |
| Groundnut | GG-20 | 1500.00 | 1600 | | | |
| Gujarat Total | | 1500.00 | 1600 | | | |

Table 2.2 Introduction to Alternate Crops/Varieties by KVKs

Major Area Coverage under Alternate **Crops/Varieties**

Zone Total

With the effort of KVKs of the Rajasthan and Gujarat farmers have adopted drought tolerating alternate crops and varieties. Total 3270 ha area was covered under different category of crops and 5903 numbers of farmers were actively participated and got additional advantages. State-wise details of area covered under different category of crops and number of farmers is given in table 2.3. In Rajasthan large area is covered under pulses (550 ha) followed by oilseeds (90 ha), cereals (40 ha) and vegetables (4ha). Likewise, in Gujarat large area is covered under oilseeds (1666 ha) followed by pulses (870 ha), and fodder (50 ha).

Farmers-scientist Interaction on Livestock **Management**

9402

13270.00

Animals are the alternate source of income in case of crop failure. Farmers-scientist interactions were carried out on livestock management in KVKs of Rajasthan and Gujarat to promote livestock production in the zone. Total 13 interactions were organized in the zone, of which 4 in Rajasthan and 9 in Gujarat. Total 559 farmers participated and get benefited. State-wise details are given in the table 2.3.

Animal Health Camps Organized

A total of 29 animal health camps were organized during the year in the zone. Total number of 6834 animals treated in these camps



Table 2.3 Major area Coverage under Alternate Crops/Varieties

| Crops | Area (ha) | Number of farmers |
|-----------------|-----------|-------------------|
| | Rajasthan | |
| Cereals | 40.00 | 175 |
| Oilseeds | 90.00 | 409 |
| Pulses | 550.00 | 329 |
| Vegetable crops | 4.00 | 50 |
| Total Rajasthan | 684.00 | 963 |
| | Gujarat | |
| Fodder | 50.00 | 2000 |
| Oilseeds | 1666.00 | 1490 |
| Pulses | 870.00 | 1450 |
| Total Gujarat | 2586.00 | 4940 |
| Zone Total | 3270.00 | 5903 |

involving 1451 farmers of different categories (small, marginal & landless, medium, large, etc.). State-wise details are given in the table 2.4.

Arrangement of Seeds of Suitable Varieties in Drought Hit States

KVKs of Rajasthan and Gujarat arranged seeds of various drought tolerant crops and

varieties to the farmers of the drought hit regions. Total 220ha area was covered in the zone by 42.6q quality seeds in Rajasthan and Gujarat. Total 790 farmers were actively involved. State-wise details are given in the table 2.5.

Table 2.4 Farmers-scientist Interaction on Livestock Management

| Livestock components | Number of interactions | No. of participants | | | | | |
|---|------------------------|---------------------|--|--|--|--|--|
| Rajasthan | | | | | | | |
| Green fodder production feed and fodder management | 4 | 123 | | | | | |
| Rajasthan Total | 4 | 123 | | | | | |
| | Gujarat | | | | | | |
| Dairy management, feed management, Artificial insemination, Green fodder production | 9 | 436 | | | | | |
| Gujarat Total | 9 | 436 | | | | | |
| Zone Total | 13 | 559 | | | | | |



| Table 2.5 <i>A</i> | Animal | Health | Camps | Organized | |
|---------------------------|--------|--------|-------|-----------|--|
| | | | | | |

| State | Number of camps | No. of animals | No. of farmers |
|-----------|-----------------|----------------|----------------|
| Rajasthan | 15 | 4895 | 569 |
| Gujarat | 14 | 1939 | 882 |
| Total | 29 | 6834 | 1451 |

Large Scale Adoption of Resource **Conservation Technologies**

The various resource conservation technologies introduced by KVKs like moisture resistant varieties, rain water harvesting, micro irrigation, ridge & furrow method of sowing, multching, etc. were adopted by farmers in Rajasthan and Gujarat on large scale is given in the Table 2.7. Total 779740 ha area were covered under these technologies with active involvement of 257917 farmers by adopting these resource conservation technologies in the zone.

Awareness Campaign

Awareness campaigns were organized in Rajasthan and Gujarat, under which various activities were organized like meetings (109), gosthies (67), field days (83), farmer's fair (13), exhibition (41), film shows (78). State-wise details of various activities and number of farmers benefited are given in the table 2.7. Trainings on Rainwater Harvesting Structure and Micro-Irrigation System

Majority of the area under Rajasthan and gujarat is covered under arid and semi arid climatic condition, so rain water harvesting and micro irrigation are the important component for water conservation and drought mitigation. KVKs of the zone have conducted trainings on these issues to provide technical skill to farmers to conserve water in adverse climatic condition. A total 17 KVKs conducted 33 training courses

Table 2.6 Seed Distribution by KVKs of Rajasthan and Gujarat

| Crops | Quantity (q) | Coverage of area (ha) | Number of farmers | | | |
|-----------------|--------------|-----------------------|-------------------|--|--|--|
| Rajasthan | | | | | | |
| Green gram | 30.00 | 200.00 | 300 | | | |
| Rajasthan Total | 30.00 | 200.00 | 300 | | | |
| | Guja | rat | | | | |
| Chick pea | 12.50 | 20.00 | 50 | | | |
| Gujarat Total | 12.50 | 20.00 | 50 | | | |
| Zone Total | 42.50 | 220.00 | 350 | | | |

Table 2.7 Large Scale Adoption of Resource Conservation Technologies

| Crops/cultivars and gist of resource conservation technologies introduced | Area (ha) | Number of farmers | | |
|--|-----------|-------------------|--|--|
| Rajasth | an | | | |
| Use of Bio fertilizers | 35000.00 | 40500 | | |
| Use of Bio Agent | 26300.00 | 28400 | | |
| Use of Pheromone traps | 15200.00 | 12740 | | |
| Adoption of Trichoderma | 22500.00 | 24300 | | |
| Cumin variety GC-4 | 176305.00 | 122500 | | |
| Use of Rotavator | 375707.00 | 320160 | | |
| Application of Beuuveria bassiana | 15030.00 | 19350 | | |
| Rajasthan Total | 666042.00 | 567950 | | |
| Gujara | at | | | |
| Use of Bio fertilizers | 485.00 | 488 | | |
| Use of Bio Agent | 10364.00 | 10364 | | |
| Use of Pheromone traps | 6250.00 | 6175 | | |
| Use of drip irrigation system | 175.00 | 200 | | |
| Adoption of Trichoderma culture powder for the management of stem rot disease in groundnut | 5322.00 | 46789 | | |
| Adoption of Bt. cotton varieties. | 328897.00 | 82224 | | |
| Farmers prefers to sow semi spreading and high yielding variety of groundnut i.e. GG-20. | 204808.00 | 51702 | | |
| Most of the farmers adopt new variety of cumin (GC-4) which is resistant to wilt disease | 20108.00 | 5102 | | |
| Intercropping/mix cropping in groundnut and cotton was adopted for minimize the risk factor in dry land agriculture with preservation of natural enemies | 21789.00 | 6342 | | |
| Farmers are ready to use of rotavator/ cotton shredder/ mobile chopper for increasing the organic matter in soil particularly in cotton system. | 174532.00 | 43633 | | |
| Adoption of <i>Trichoderma</i> for cotton and groundnut crop | 2500.00 | 1288 | | |
| Application of Beuuveria | 4500.00 | 3300 | | |
| Gujarat Total | 779730.00 | 257607 | | |
| Zone Total | 779740.00 | 257917 | | |



for 951 participants including 806 male and 145 female participants. Out of these participants a total of 345 were from SC/ST category including 253 male and 92 female. State-wise details are given in Table 2.9.

Soil Water and Plant Analysis by KVKs

Soil and water testing laboratories have been established in total 72 KVKs and 64 KVKs had analysed soil and water samples for the betterment of farming community. KVKs are also utilizing these facilities for giving recommendations to the farmers regarding suitability of water for irrigation, nutrient application based on soil test for conducting OFTs and FLDs as well as rendering advisory services to the farmers. A total of 58101samples of soil, water, plant etc received from 70544 farmers belonging to 2845 villages have been analyzed and realized an amount of Rs. 29.23 lakh. Out of these, 45212 were soil samples followed by water (12247) and plant samples (641). State-wise data in the Table 2.10 showed that KVKs in Gujarat analyzed more samples (29156) than Rajasthan (28945).

Table 2.8 Activities Conducted under Awareness Campaign by KVKs

| | R | ajasthan | | Gujarat | | Total |
|--------------|-----|----------------|-----|----------------|-----|----------------|
| Activities | No. | No. of farmers | No. | No. of farmers | No. | No. of farmers |
| Meetings | 49 | 1283 | 60 | 2299 | 109 | 3582 |
| Gosthies | 40 | 5479 | 27 | 1209 | 67 | 6688 |
| Field days | 47 | 2720 | 36 | 902 | 83 | 3622 |
| Farmers fair | 10 | 11542 | 3 | 2132 | 13 | 13674 |
| Exhibition | 28 | 52710 | 13 | 10942 | 41 | 63652 |
| Film show | 33 | 6646 | 45 | 1976 | 78 | 8622 |

Table 2.9 Trainings on Rainwater Harvesting Structure and Micro-Irrigation System

| State | No. of KVK | No. of Courses | No. of Participants including SC/ST | | | No. of SC/ST Participants | | |
|-----------|---------------|-------------------|-------------------------------------|--------|-------|------------------------------|--------|-------|
| | | | Male | Female | Total | Male | Female | Total |
| Rajasthan | 6 | 14 | 325 | 19 | 344 | 92 | 11 | 103 |
| Gujarat | 11 | 19 | 481 | 126 | 607 | 161 | 81 | 242 |
| Total | 17 | 33 | 806 | 145 | 951 | 253 | 92 | 345 |



Table 2.10 Soil Water and Plant Analysis by KVKs

| State | Samples | No. of samples | No. of Farmers | No. of villages | Amount realized (Rs.) |
|-----------------|---------|----------------|-------------------|-----------------|-----------------------|
| Rajasthan Total | Soil | 23384 | 37201 | 765 | 1139123 |
| | Water | 5154 | 4907 | 414 | 59836 |
| | Plant | 407 | 230 | 80 | 4900 |
| | Manure | 0 | 0 | 0 | 0 |
| | Total | 28945 | 42338 | 1259 | 1203859 |
| Gujarat Total | Soil | 21828 | 21115 | 1007 | 1356220 |
| | Water | 7093 | 6775 | 441 | 362965 |
| | Plant | 234 | 315 | 137 | 0 |
| | Manure | 1 | 1 | 1 | 0 |
| | Total | 29156 | 28206 | 1586 | 1719185 |
| Zone Total | Soil | 45212 | 58316 | 1772 | 2495343 |
| | Water | 12247 | 11682 | 855 | 422801 |
| | Plant | 641 | 545 | 217 | 4900 |
| | Manure | 1 | 1 | 1 | 0 |
| | Total | 58101 | 70544 | 2845 | 2923044 |



Method Demonstration on collection of Soil Samples - KVK Jamnagar





RESEARCH ACHIEVEMENTS

During XII plan, Zonal Project Directorate has been elevated as ICAR-Agricultural Technology Application Research Institute (ATARI) with the research as one of the major mandates. ICAR-ATARI, Jodhpur is executing various research projects for strengthening the agricultural extension research. The brief description of each project is given below:

3.1 Attracting and Retaining Youth in Agriculture (ARYA)

Profitable agriculture is the crucial for attracting and retaining youth in agriculture. The modern youth can be reached through mobile and provided with soil health parameters including nutrients and microbes and entrepreneurial youth can function as soil health doctor. In this direction, ICAR-ATARI, Jodhpur has initiated ARYA project through KVK, Banswara in Rajasthan and Rajkot-I in Gujarat with the following specific objectives:

- To attract and empower the youth in rural areas to take up various agriculture, allied and service sector enterprises for sustainable income and gainful employment in selected districts,
- To enable the farm youth to establish network groups to take up resource and capital intensive activities like processing, value addition, marketing, etc., and

 To demonstrate functional linkage with different institutions and stakeholders for convergence of opportunities available under various schemes/program for sustainable development of youth.

The entrepreneurship development has been promoted through the stages mentioned in the fig.-1.

For setting up of the entrpreneurial units at doorstep of 200 rural youth, KVK, Banswara has developed entrepreneurship in the three agribased vocational enterprises viz., horticulture nursery; poultry and goatery while KVK, Rajkot-I had major interventions through nursery management, processing & value addition and milk processing.

Of total 200 youth, 22 in nursery management, 113 in poultry and 63 in goatery have been identified for skill development. KVK, Banswara organized skill oriented training programmes for 22 youth in nursery management, 63 in poultry and 30 in goatery during 2016-17. After skill development of youth in poultry, 100 poultry birds of Pratapdhan breed of six-week aged were provided to every trainee in collaboration with Department of Animal Production, Rajasthan College of Animal, Udaipur under Tribal Sub Plan head and Department of Animal



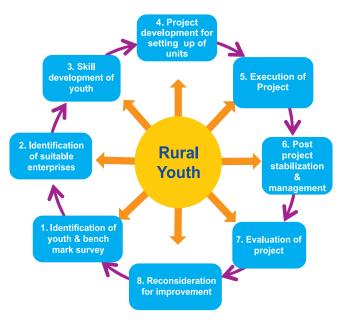


Fig. 1. Entrepreneurship development among youth.

Husbandry, Govt. of Rajasthan, Banswara under TAD head which resulted in starting of the work of rearing birds at trainees' door step is started. Efforts have also been done by KVK for marketing linkages.

- Three WhatsApp groups have been formed for sharing the information among trainees.
- Meeting with local seller for marketing the products in nearby towns.
- Efforts made to tie-up with Venkis & Rajdhani Pvt. Ltd. Company for bulk purchasing of products from ARYA trainees at reasonable prices.
- Convergence with state departments/ICAR institutes and other institutes for setting up of units.

Under horticulture nursery, KVK has made efforts for providing 50 fruit plants in collaboration with Central Institute of Sub-





Training of rural youth: KVK, Banswara (Rajasthan)



Tropical Horticulture, Lucknow and College of Horticulture & Forestry, Jhalawar (Rajasthan) under TSP head for establishing the mother orchards at trainees' farm house for establishing the horticulture nursery at commercial level. From the trained youth, 32 have started the poultry units and 4 rural youth have established mother orchards of fruit plant and vegetable nursery. Income of the rural youth is ranged from Rs. 4000 to Rs. 18, 000 per month by selling of cocks & eggs and vegetable seedlings of their own units.

KVK, Rajkot-I also organized training programmes for skill development of the rural youth in post-harvest technology, nursery management and milk processing. One youth started value addition in chili powder and earning up to Rs. 67,000/year. Herbal jiggery also promoted by KVK where an entrepreneur is earning Rs.1.0 lakh/acre/year. Two youth started vegetable plug nursery and earning up to Rs.3.0

lakh. One youth has promoted in milk processing where he is getting Rs. 4.2. lakh per year.

Several initiatives have been taken by ICAR-ATARI Jodhpur for efficient functioning of ARAY project and its concurrent monitoring. Conducted bench mark survey, geo-coordinates of youth's units, organizations of district and zonal level review meetings, formation of project committees etc, were undertaken. ICAR-ATARI also documented entrepreneurship development in form of highlights of ARYA project in Hindi and English. Institute also produced video film on ARYA project showing success of rural youth in poultry, nursery and other enterprises.

3.2 Demonstration of Climate Resilient Integrated Farming System (IFS) through KVKs.

National Mission for Sustainable Agriculture (NMSA) is one of the 8 missions



Nursery Management: KVK Rajkot-I (Gujarat)





Zonal committee meeting: ICAR-ATARI, Jodhpur

under National Action Plan on Climate Change (NAPCC) seeks to address issues regarding Sustainable Agriculture' in the context of risks associated with climate change by devising appropriate adaptation and mitigation strategies for ensuring food security, equitable access to food resources, enhancing livelihood opportunities and contributing to economic stability at the national level. The mission acknowledges that the risks to the Indian agriculture sector due to climatic variability and extreme events would be accentuated at multiple levels including at the levels of crop or livestock, farm or cropping system and the food system. Under NMSA, Ministry of Agriculture & Farmers Welfare, Government of India, New Delhi has initiated one of the important mission mode project to take up demonstrations of Climate Resilient Integrated Farming System practices through 100 Krishi Vigyan Kendra during year 2016-17.

Under project, various components or combination of IFS models suitable to the local agro-climatic conditions have been taken up



District level review meeting: KVK, Banswara

with an emphasis to demonstrate and optimize the farm productivity in the sustained manner at small farm units. These demonstration units of IFSs are supposed to have commercial as well as educational value. These components will minimize the risk against the local climate aberrations providing additional livelihood opportunities and will enhance the farm income. Under ICAR-ATARI, Jodhpur, 12 KVKs have been selected in which 8 KVKs were from Rajasthan and 4 KVKs from Gujarat state. Financial support was provided to each KVK @Rs. 3.00 lakh to establish the various components of Integrated Farming System (s) at KVK farm as demonstration units for wider acceptability among farming community. Sustained growth in agriculture sector is essentially required from crop diversification, agri-processing and secondary agriculture to provide ancillary income to farmers. In arid and semi-arid zone, livestock as a component of IFSs will also ensure the nutritional & food security, livelihood and social security. The KVK wise components have been depicted in table given below:



Table: KVK wise IFS model components established during 2016-17.

| State | Name of KVKs | Components of IFS | | |
|-----------|-------------------|---|--|--|
| Rajasthan | 1. Bikaner-1 | Poultry unit | | |
| | | Water harvesting structure | | |
| | 2. Alwar-1 | Water harvesting structure | | |
| | | Vermi -compost unit | | |
| | 3. Dausa | Renovation of water harvestings structure | | |
| | | Vermi-compost unit | | |
| | 4. Sawai Madhopur | Renovation of water harvesting structure | | |
| | | Vermi-compost unit | | |
| | 5. Nagaur | Rainwater harvesting unit | | |
| | | Vermi-compost unit | | |
| | | Goat unit | | |
| | | Azolla unit | | |
| | 6. Pali | Rainwater harvesting unit | | |
| | | Vermi-compost unit | | |
| | 7. Tonk | Small ruminant unit | | |
| | | Apiculture (Bee-keeping) | | |
| | | Vermi-compost unit | | |
| | | Water lifting devices | | |
| | 8. Jodhpur-1 | Dairy unit | | |
| | | Renovation of Tanka | | |
| | | Vermi-compost production unit | | |
| Gujarat | 9. Banaskantha-I | Water harvesting system | | |
| | | Post-harvest unit | | |
| | 10. Sabarkantha | Goat unit | | |
| | | Poultry unit | | |
| | | Renovation of water harvesting structure | | |
| | 11. Amreli | Goat unit | | |
| | | Pulse based | | |
| | | Horticulture based | | |
| | | Vermi-compost | | |
| | | Farm pond | | |
| | | Water lifting devices | | |
| | | Post-harvest & storage | | |
| | 12. Narmada | Mushroom unit | | |
| | | Poultry unit | | |
| | | Azolla unit | | |
| | | Vermi-compost unit | | |



(A) Components wise progress of in Rajasthan state



Vermi-compost unit: KVK Alwar-I



Azolla unit: KVK Alwar-I



Renovation of water harvesting structure: KVK Sawai Madhopur



Vermi-compost unit: KVK Sawai Madhopur



Vermi-compost unit: KVK Pali



Vermi-compost unit: KVK, Pali



Horticulture unit: KVK Jodhpur-I



Horticulture unit: KVK Jodhpur-I



(B) Components wise progress of in Gujarat state



Water harvesting unit: KVK Banaskantha



Post harvest unit: KVK Banaskantha



Goat unit: KVK Sabarkantha



Goat-unit of KVK Amreli



Vermi-compost of KVK Amreli



Horticulture based unit of KVK Amreli



Water lifting devices of KVK Amreli



3.3 Promotion of Sustainable Livelihoods through Skill Development of Farmers

To make the farming as profitable venture and attractive for the rural youth, there is need to recognize that agriculture is a highly skilled profession. People involved in this sector are partially skilled, and they need upskilling and knowledge enhancement. Agricultural activities from production to post harvest and marketing are very scientific. Skill development will increase productivity and quality which automatically translates into income enhancement and reduction in migration. Large portion of farming community in India is marginal and small holders. To make agriculture sustainable, it has to be supplemented by some other source of income – which can be dairy, poultry, fisheries, processing and so on, so that the farmers are ensured of regular income. Training is an integral part for equipping the workforce to improve the product not only for domestic market but also for export market. Therefore to achieve rapid growth in the agriculture sector through intensive skill development, Agriculture Skill Council of India (ASCI) and Department of agriculture cooperation and farmers welfare started collaborative efforts to provide skill development trainings of 200 hrs through KVKs. ICAR-ATARI, Jodhpur conducted a three days' Orientation Training Programme for KVK's Trainers under Skill Development Programme for Master Trainers of 24 KVKs from Rajasthan, Gujarat, Uttar Pradesh and Haryana is being organised in collaboration with Agricultural Skill Council of India (ASCI) during 07-09 November 2016. A total of 47 certified master trainers from KVKs, ATARIS Jodhpur and Kanpur and EEI, Anand were trained during programme.

A total of 32 skill development trainings in collaboration with ASCI were conducted through 17 selected KVKs including 11 from Rajatshan and 6 from Gujarat states on different Job Roles to provide opportunity to get gainful employment generation for their sustainable livelihood. As per the guideline of National Skill Qualification Framework (NSQP); Occupational Standards (NOS), Qualification Packs (QPs) and Curriculum were developed for each Job role. A total of 594 rural youth were trained including 387 from Rajatshan and 207 from Gujarat states. The third party assessment of the master trainers as well as trained rural youths was done with external agency and certificates were provided to the participants on successful completion of training. Online database has been created of all the participants and training organization and master trainers.

Table: Skill Development Trainings conducted by KVKs of Rajasthan and Gujarat during 2016-17

| Sr. no | Name of KVK | Job Role/QPs of trainings | Number of Rural Youth Trained |
|----------|-------------|---------------------------|----------------------------------|
| Rajastha | an | | |
| 1. | Jodhpur-I | Pulses cultivator | 18 |
| 2. | | Dairy Farmer/Entrepreneur | 20 |
| 3. | Pali | Quality Seed grower | 20 |
| 4. | | Gardener | 20 |
| 5. | Ajmer | Gardener | 20 |



| Sr. no | Name of KVK | Job Role/QPs of trainings | Number of Rural Youth Trained |
|----------|---------------|--|----------------------------------|
| 6. | | Coriander cultivator | 20 |
| 7. | Bikaner-I | Pulses cultivator | 20 |
| 8. | | Dairy Worker | 20 |
| 9. | Jhunjhunu | Quality seed grower | 18 |
| 10. | | Agriculture Extension Service Provider | 13 |
| 11. | Sikar | Pulses cultivator | 17 |
| 12. | | Dairy Farmer/Entrepreneur | 15 |
| 13. | Sriganganagar | Agriculture Extension Service Provider | 20 |
| 14. | Kota | Bee Keeper | 17 |
| 15. | | Gardener | 20 |
| 16. | Hanumangarh-I | Hatchery production worker | 19 |
| 17. | | Gardner | 17 |
| 18. | Tonk | Gardner | 20 |
| 19. | | Dairy Worker | 20 |
| 20. | Udaipur | Gardner | 20 |
| 21. | | Dairy Farmer/Entrepreneur | 13 |
| Sub-Tot | al | | 387 |
| Gujarat | | | |
| 22. | Panchmahal | Bee Keeper | 20 |
| 23. | | Gardner | 20 |
| 24. | Amreli | Quality Seed Grower | 20 |
| 25. | | Vermicompost Producer | 20 |
| 26. | Dahod | Micro Irrigation Technician | 13 |
| 27. | Navsari | Hatchery production worker | 19 |
| 28. | | Floriculturist (Protected Cultivation) | 19 |
| 29. | Kheda | Quality Seed Grower | 17 |
| 30. | | Dairy Farmer/Entrepreneur | 19 |
| 31. | Valsad | Paddy cultivator | 20 |
| 32. | | Mango grower | 20 |
| Sub Tota | al | | 207 |
| Total | | | 594 |

3.4 NICRA Report 2016-17

As part of NICRA, under Technology Demonstration Component, under ATARI Jodhpur total ten districts, 5 districts viz, Bharatpur, Jhunjhunu, Jodhpur, Kota and Barmer-I from Rajasthan and 5 districts viz., Kutch, Rajkot, Valsad, Amreli and Banaskantha-I from Gujarat have been identified. During the year 2016-17 ten KVKs of Zone-VI (5 each in Rajasthan and Gujarat) carried out different



activities under Technology Demonstration Components comprised of various modules. Under this project involved 23199 farmers (NRM-2106, crop production-2147, livestock and fodder production-3916, institutional interventions-2494 capacity building-4427, extension activities-7674 and custom hiring-2059.

Under NRM 2266 demonstrations were organized, covering 2466.32 ha area which involved 2106 practicing farmers of 10 KVKs. In-situ moisture using resource conservation technology 698 demos were conducted which have been successfully implemented in the NICRA villages and involved 699 partner farmers.

On short duration varieties, total 408 demonstrations were conducted which covered an area of 180.5ha; involving clusterbean (RGC-1055, 1017), mustard (DRMRIJ-31, NRCHB-101), pearlmillet (MPMH-17), moth bean (CZM-2), greengram (GM-4), wheat (GW-173, GW-451) and groundnut (GG-9). These crop varieties recorded significantly higher yield varying from 13.98 to 41.16% as compared to locally grown varieties by the farmers. On drought tolerant varieties total 730 demonstrations were conducted which covered an area of 303.0ha; on wheat (Raj-4120), barley (RD-2592), chickpea (GC-5), sesame (RT-351), wheat (GW-451), cluster bean (RGC-1017), greengram (RMG-44, GM-4), pearlmillet (MPMH-17), castor (GCH-2) and mothbean (RMO-435, CZM-2). These crop varieties yielded significantly higher yield varying from 22.29 to 45.42% as compared to locally grown varieties by the farmers.

Total 125 demonstrations were conducted on flood tolerant paddy varietiy (MTU-1010) which covered an area 42.0 ha. The percent increase yield of crop recorded 28.57% as compared to farmers' practice. Total 10 interventions conducted on location specific inter-cropping system improved yield in 4.0ha area on soybean+maize (5:2 row), soybean+black gram (5:2 row) and Kumat (Accacia Senegal) which recorded an increase of 15.5 to 25.25% yield over local check. Under crop diversification 25 demonstrations were conducted in 10.5ha area including fenugreek (RMT-305), greengram (GM-4), Onion (GWO-1). It was observed that yield of these crops was significantly higher than farmer's practice, which ranged from 12.82 to 36.90 per cent.

Various livestock centric interventions were carried out through 3916 demonstrations which covered 4392 different categories of livestock during the year 2016-17. Total 275 livestock owners produced 8708.0q fodder on 91.0ha area for their animals. Breed improvement porgramme was carried out on Murrah buffalo bull, Tharparkar bull, Jamnapari and Sirohi bucks was undertaken in NICRA villages by involving 260 animals. Due to feeding of mineral mixture and UMMB, deworming and vaccination of the lactating animals a significant improvement in the milk production of animals (6.93 to 13.79%) was recorded. NICRA KVKs had earned total revenue of Rs 2.62 lakh through creation of Custom Hiring Centres by which 2059 farmers



completed different agricultural operations timely covering an area of 2037ha. Total of 154 training courses were conducted on various thematic areas during the year, in which 4427 partner farmers and farm women (3535 male

and 892 female) actively participated. A total of 366 activities were organized on various thematic areas in which 7674 practicing farmers (5413 males and 2261 farm women) took part.



Farm pond- Water harvesting



Resource conservation tech



FLD on Resource-conservation-technique



Mustard crop



FLD on Mineral-mixture



Field day on Mustard

3.5 CIWA Project

Activities undertaken under CIWA collaborative project

Training programmes organized: Two villages (Abhayapura and Samod) of Jaipur district were selected for implementation of interventions under CIWA project. Total 22 trainings were organized covering soil and water management, dairy management, horticulture, value addition, income generating activities, organic farming etc, involving 70 farm families and partner farm women. These trainings are helpful to improve their economic status and give them right to prove themselves. Azolla feed are helpful to improve animal health status in daily life and also improved milk production. It is very important to improve the child health status and farm-women status for that above trainings progammes were organized by KVK Chomu, Jaipur-I during the period under report.

Demonstrations: Under this project total 209 demos were conducted on different crops in area of 5.4ha including pearlmilet (40), guar (40), barley (30), mustard (25) and oats (34) and bajra and napier for fodder (40), respectively. The results showed that there was a significant increase in production of all the crops as compared to local checks. Net returns under crops were observed to be the highest (Rs 62012/ha with BCR 2.91) from oats followed by barley (Rs 55561/ha with BCR 2.67), guar (Rs 25068/ha with BCR 2.60), pearlmillet (Rs 9782/ha with BCR 1.62), respectively. Net returns from bajra napier hybrid was Rs 155788/ha with BCR of 2.87 in Samod village; while it was observed to be Rs 96163/ha with BCR of 2.16 in Abhyapura village. Azolla units were also established in the adopted villages among 70 farm families for balanced nutrition of livestock and to improve the milk production which resulted in health status and life quality of farm women.

Horticulture: Under fruit plants 40 demo were conducted (10 plants/family) were given which includs lasoda, karondas, lime etc. Under Nutrigarden, total 140 demos were laidout (100 sq, meter/family) seeds of spinach, fenugreek, turnip, coriander, radish, chillies, onion, tomato, brinjal etc with application and use of this intervention on each family got fresh leafy and root green vegetables throughout the year and this saved Rs 3000 to 3800/family/year. It further helped in improving the nutritional health status of farm women.

Ergonomics of Farm Women Drudgery reduction: Total 40 milking revolving stools and 40 dung collector were demonstrated to farm women in operational villages. It was observed that using revolving milking stool significantly reduced the legs pain and improved the body posture which further improved the working efficiency of farm women. Similarly, using the dung collector in animal house reduce the back pain and increased the working efficiency and proved helpful in reducing the drudgery of farm women.

Under income generating activities total 15 trainings were organized for the farm women on candle making, chalk making, agarbatti making, fruit and vegetable preservation etc. It was observed that these trained farm women earned Rs 2000 to 3000/month/woman which strengthened the economic status of farm women.





Distrbution of vegetable seedlings



Training programme of Farm women



Demo on revolving milking stool



Sprayer being used by Farm woman



Demo on fodder at farmers field



Training programe on Kitchen gardening



3.6 Farmers FIRST Programme

Farmer FIRST aims at enhancing Farmers-Scientist interface for technology development and application. It will be achieved with focus on innovation, technology feedback, multiple stakeholders participation, multiple realities, must-method approaches vulnerability and livelihood interventions. The major components of project is

- Enhancing Farmer-Scientist interface
- Technology Assemblage, application and feedback
- Partnership and institutions building
- Content mobilization

With active collaboration, coordination and support of Division of Agricultural Extension, ICAR, New Delhi and ICAR-ATARI, Jodhpur, Five major partners are actively involved in execution of Farmer FIRST programme in a holistic and demand driven approach. Main partners are - Central Sheep & Wool Research Institute, Avikanagar, Dist Tonk; Central Arid Zone Research Institute, Jodhpur, Agriculture University, Jodhpur; Navsari Agricultural University, Navsari and Junagadh Agricultural University, Junagadh, Gujarat.

Activities undertaken:

Based on the approved technical work plan under Farmers FIRST programme of 2016-17, need based, situation specific and resource affordable technological modules were executed with full participation of different categories of farmers including farm women. Participatory programme in the forms of on-farm trials and demonstrations were carried out by involving 250 farm families on different thematic areas, viz, crops, vegetables, fruit plants, Natural Resource Management, livestock etc during 2016-17. Farmers have been mobilized to act as decision makers in each stage of technological intervention being implemented under this programme.



Balanced Feeding - CAZRI Nutrient Block



Inauguration cum Awareness Workshop of FFP 2







Faremr Scientist Interaction-JAU



Awarness Programme - JAU

3.7 Mera Gaon Mera Gaurav-2016-17

The progress report of Mera Gaon Mera Gaurav for the year 2016-17 has been compiled as per the format and same is narrated herein.



Exposure visit-CSWRI



Input distribution-JAU



Awareness programme - AU Jodhpur

Zonal Summary: In this zone, a total of 326 teams have been formed involving 1190 Scientists from 8 ICAR institutes and 11 Sate Agricultural Universities of Rajasthan and Gujarat states. These teams have adopted 1417



villages. All teams have collected baseline information of the adopted villages. Teams have conducted total 17145 activities including interface meetings, demonstrations related to oilseeds, pulses, cereals, vegetables etc. and training programmes covering crops, animals, horticulture and fisheries aspects in adopted villages during the year 2016-17. Under farm advisory services total 20637 SMS have been

sent to the farming community involving 212034 farmers under MGMG programme. Activities have been carried out through creating strong linkages with Government, Nongovernment, Cooperatives and other stakeholders in convergence mode.

Goals, aims and objectives and activities of various centrally sponsored schemes have

Zonal Summary: ATARI, Jodhpur

| ATARI Jodhpur | No. of institutes/ universities involved | Total No. of Groups formed | No. of Scientist Involved | No. of village covered | No. of field activities conducted | No. of messages/ advisory sent | Farmers benefited (No.) |
|------------------|--|----------------------------------|---------------------------------|------------------------|-----------------------------------|--------------------------------------|-------------------------------|
| ICAR Instit | utes | | | | | | |
| CAZRI | Jodhpur | 22 | 88 | 103 | 18 | 104 | 680 |
| CSWRI | Avikanagar | 4 | 17 | 18 | 131 | 3 | 1260 |
| CIAH | Bikaner | 2 | 14 | 5 | 372 | 102 | 1615 |
| DRMR | Bharatpur | 5 | 21 | 25 | 260 | 158 | 5319 |
| NRCSS | Ajmer | 5 | 25 | 23 | 16 | 85 | 3775 |
| NRCC | Bikaner | 3 | 15 | 15 | 20 | 10 | 550 |
| DGR | Junagadh | 5 | 18 | 25 | 90 | 20 | 2500 |
| DMAPR | Anand | 5 | 16 | 25 | 9 | 16 | 276 |
| Sub-Total (| Sub-Total (8) | | 214 | 239 | 916 | 498 | 15975 |
| State Unive | rsities | | | | | | |
| AU | Jodhpur | 8 | 21 | 21 | 331 | 103 | 843 |
| AU | Kota | 8 | 23 | 31 | 1902 | 2387 | 14332 |
| MPUAT | Udaipur | 18 | 61 | 90 | 1725 | 1053 | 26295 |
| SKRAU | Bikaner | 24 | 87 | 108 | 219 | 140 | 3515 |
| SNKAU | Jobner | 19 | 23 | 19 | 504 | 431 | 4196 |
| RAJUVAS | Bikaner | 37 | 142 | 135 | 2993 | 761 | 20592 |
| AAU | Anand | 53 | 225 | 276 | 1032 | 10186 | 38938 |
| JAU | Junagadh | 34 | 118 | 167 | 6977 | 2468 | 61767 |
| NAU | Navsari | 41 | 164 | 205 | 239 | 2260 | 21231 |
| SDAU | Dantiwada | 31 | 102 | 116 | 287 | 62 | 1550 |
| Kamdhu | Anand | 2 | 10 | 10 | 20 | 18 | 2800 |
| Sub-Total (| 11) | 275 | 976 | 1178 | 16229 | 19869 | 196059 |
| G. Total (19 |)) | 326 | 1190 | 1417 | 17145 | 20367 | 212034 |



been appraised by teams amongst farmers. Follow-up studies have been initiated to assess suitability, accessibility and appropriateness of various location specific technologies. Majority of ICAR and SAUs have reported that advisory role is playing pivotal role in timely management of insect-pests in crops, vegetables and fruits etc.

Total visits to villages 2864 which covered 38328 farmers, 1796 interface meetings/gosthis were organized involving 32404 partner farmers. Total 839 training were conducted for 18411 trainee farmers; while 3379 demonstrations were conducted at 9608 farmers' fields. During the year total 7738 advisory were given to 30733 practicing farmers and 8003 literature was made available to 44621 partner farmers. Total 1172 Awareness programmes were organized on different aspects related to crop, livestock, horticulture, IFS, plant protection, fisheries, poultry, be keeping etc which involved 44974 participants. Total 2489 input in the form of seeds fertilizers, vermi compost, planting material and bio-fertilizers etc were made available to 3772 farmers of different categories. Thus, total 17145 activities were conducted by 19 institutes including ICAR institutes and State Agricultural Universities of Rajasthan and Gujarat states involving 212034 farmers. State-wise brief summary of MGMG is as under:-

Rajasthan State: It has been observed in Rajasthan a total of 155 teams have been formed involving 537 Scientists from 6 ICAR institutes and 5 State Agricultural University have carried out different activities under MGMG. These teams have adopted 593 villages, which have conducted total 8491 activities including interface meetings, demonstrations related to oilseeds, pulses, cereals, vegetables etc. and

training programmes covering crops, animals, horticulture and fisheries aspects in adopted villages during the year 2016-17. Under farm advisory services total 5337 SMSs have been sent to the farming community involving 82972 farmers under MGMG programme. Activities have been carried out through creating strong linkages with Government, Non-government, Cooperatives and other stakeholders in convergence mode.

Gujarat: It has been observed that in Gujarat a total of 171 teams have been formed involving 653 Scientists from 2 ICAR institutes and 5 Sate Agricultural University have carried out different activities under MGMG. These teams have adopted 824 villages, which have conducted total 8654 activities including interface meetings, demonstrations related to oilseeds, pulses, cereals, vegetables etc. and training programmes covering crops, animals, horticulture and fisheries aspects in adopted villages during the year 2016-17. Under farm advisory services total 15030 SMSs have been sent to the farming community involving 129062 farmers under MGMG programme. Activities have been carried out through creating strong linkages with Government, Nongovernment, Cooperatives and other stakeholders in convergence mode.

3.8 Awareness cum Training Programmes on Protection of Plant Varieties and Farmers Right Act (PPV&FRA)

In order to encourage the development of new varieties of plants, to recognize and protect the rights of the farmers in respect of their contribution made at any time in conserving, improving and making available plant genetic resources for the development of the new plant









Animal Health camp-CSWRI



Demo on Mustard-DRMR



Training Programme at DRMR



Animal treatment camp-NRC Camel



Field visit groundnutcrop-JAU



Farmer Training-JAU



Training at Sabar Dairy-Kamdhanu



FLD Kit Distribution-Navsari

varieties Protection of Plant Varieties and Farmers Right Act (PPV&FRA) has been came in force during 2005. ICAR-ATARI, Jodhpur is organizing awareness cum training programmes on PPV&FRA in collaboration with protection of plant varieties and farmers right authority New Delhi. A sensitization workshop on Protection of Plant Varieties and Farmers Right Act was organized ICAR-ATARI, Jodhpur on 9th March 2017 for nodal officers of 34 KVKs selected from Rajasthan and Gujarat states.

A total of 23 awareness cum training programmes on PPV&FRA were conducted by 13 selected KVKs including eight from Rajatshan and five from Gujarat. A total of 2518 farmers were participated in the programmes during 2016-17. Due to creation of awareness among the farmers, many farmers came forward and applied to register the traditional plant varieties under PPV&FRA.



Table: Awareness cum training programmes on PPV&FRA conducted by KVKs of Rajasthan and Gujarat during 2016-17

| Sl. No. | KVK | No of trainings | No of Farmers Participants |
|-----------|---------------|-----------------|----------------------------|
| Rajasthan | | | |
| 1. | Dholpur | 01 | 183 |
| 2. | Pratapgarh | 02 | 120 |
| 3. | Patan | 02 | 170 |
| 4. | Hanumangarh-I | 02 | 145 |
| 5. | Rajsamand | 02 | 120 |
| 6. | S. Madhopur | 02 | 212 |
| 7. | Jhalawar | 01 | 118 |
| 8. | Sikar | 01 | 80 |
| Sub-Total | | 13 | 1148 |
| Gujarat | | | |
| 9. | Amreli | 01 | 118 |
| 10. | Dangs | 02 | 534 |
| 11. | Tapi | 03 | 224 |
| 12. | Sabarkantha | 02 | 312 |
| 13. | Kutch-1 | 02 | 182 |
| Sub-Total | | 10 | 1370 |
| Total | | 23 | 2518 |

3.9 Seed Hub Project

A collaborative project DAC-ICAR (Production of Quality Seed of Indigenous Pulses under Seed Hub concept) has been sanctioned in June, 2016 by Ministry of Agriculture and Farmer Welfare, Government of India, New Delhi thorough implementation by Division of Agricultural Extension and Crop Sciences of ICAR. Total 150 pulses seed hubs have been sanctioned and 96 seed hubs are being executed by Krishi Vigyan Kendras across the country. ICAR-ATARI, Jodhpur has been

given responsibility to coordinate and monitor quality seed production of Kharif, Rabi and Summer pulses of 14 Krishi Vigyan Kendras including 8 from Rajasthan and 6 from Gujarat. Seven Krishi Vigyan Kendras viz., Udaipur, Kota, Jhunjhunu in Rajasthan and Kheda, Rajkot-I, Tapi and Navsari in Gujarat have been sanctioned in first phase (June, 2016) for undertaking seed production at own farms as well as farmers' fields in a partcipatory mode. Naguar-I, Alwar-I, Ajmer, Jhalawar, Bundi in Rajasthan Panchmahal and Dahod in Gujarat

Target and Achievement of Seed Production in Rajasthan & Gujarat during Kharif 2016-17

| | 0 | | | • | • | 8 | |
|-----------|------------|-----------|--------|----------------|-------------|------------------------------------|-------------------------|
| Name of | Crop | Variety | | | Seed Produc | tion (q) | |
| KVK | | | Target | Area sown (ha) | Production | Category of Seed (F/S, C/S or T/L) | Reason of Short fall |
| Jhunjhunu | Green gram | IPM-02-03 | 150.00 | 27.00 | 100.54 | B/S & T/L | Damage due to rain |
| Kota | Black gram | PU-31 | 150.00 | 32.00 | 200.00 | T/L | |
| Rajkot-I | Pigeon pea | Vaishali | 150.00 | 38.00 | 301.27 | C/S | |
| Navsari | Pigeon pea | BSMR-853 | 300.00 | 35.00 | 263.00 | C/S | |
| Tapi | Pigeon pea | Vaishali | 150.00 | 20.00 | 17.85 | T/L | |
| | | Total | 900.00 | 152.00 | 882.66 | | |

Target and Achievement of Seed Production in Rajasthan & Gujarat during Rabi 2016-17

| Name of | Crop | Variety | | | Seed Produ | ction (q) | |
|-----------|--------------|-------------------|---------|-------------------|------------|------------------------------------|--------------------------|
| KVK | | | Target | Area sown (ha) | Production | Category of Seed (F/S, C/S or T/L) | Reason of Short fall |
| Jhunjhunu | Chickpea | GNG-1581 | 250.00 | 28.00 | 321.84 | T/L | |
| Kota | Chickpea | GNG-1958 | 250.00 | 13.00 | 250.00 | T/L | |
| Udaipur | Chickpea | GNG 1581, 1958 | 250.00 | 40.00 | 436.29 | F/S | |
| Tapi | Chick pea | GG-3 | 200.00 | 20.00 | 15.36 | T/L | Due to scarcity of water |
| Kheda | Chick pea | GJG-3 | 250.00 | 20.00 | 281.00 | C/S | |
| | | Total | 1200.00 | 121.00 | 1304.49 | | |

have been sanctioned in December, 2016. KVKs identified in first phase have initiated seed production during Kharif-2016 and seed production of targeted crops have also been undertaken during Rabi-2016-17 and Summer-2017 by these KVKs. Crop and KVK-wise seed production are as follows:

Post Office Linkage Extension Model

In present time agricultural technologies are generated at faster pace but dissemination is not keeping pace because of wide ratio of extension workers to farmers. Under such scenario Branch post masters of post offices in

rural areas can be potential extension agents. Keeping this in view, to strengthen the linkage between IARI, KVKs - Post office and farmers a collaborative project of ICAR ATARI, Jodhpur and Indian Agricultural Research Institute (IARI), New Delhi "Post Office Linkage Extension Model" has been implemented in 10 KVKs including 6 from Rajasthan and 4 from Gujarat. A review cum planning meeting of KVKs was conducted on 31st August 2016 at ICAR- ATARI, Jodhpur. During 2016-17 One KG seed of New variety of Bottle Gourd – Pusa Naveen has been sent to each of six KVKs of Rajasthan, 50 kg seeds of 2511 variety of Paddy



has been sent to each of four KVKs of Gujarat and 12 kg seeds of PM-28 variety of Paddy has been sent to six KVKs of Rajasthan and four KVKs of Gujarat each through Post Offices. Two post masters have been identified from each District for IARI – Post Office Linkage Extension Model. The sensitization of post masters for dissemination of seeds and information on farming practices was done at KVK level. Post Office Linkage Extension Model is proving to be an one of the important model of transfer of technology in agriculture.

Tribal Sub-Plan

Tribal Sub-Plan (TSP) has been implemented through KVKs of Rajasthan and Gujarat to address the issues of backwardness in tribal areas and tribal population in a holistic manner. The main motto of the plan is to minimize the gap between the livelihood of tribal people and general communities. The basic objective of Tribal Sub-Plan is to channelize the flow of outlays and benefits from the general sectors in the Central Ministries/Departments for the development of Scheduled Tribes. Ten KVKs under ICAR-ATARI, Kolkata were selected for this scheme during the year 2016-17, namely KVK



Distribution of storage bins to farmers under NSP-TSP KVK Dungarpur

Banswara, Dungarpur, Pratapgarh, Udaipur from Rajasthan and KVK Valsad, Bharuch, Narmada, Dang, Dahod, Vyara from Gujarat. A total of Rs. 160.53 lakh was earmarked during the period for selected KVKs of this Zone. To improve the livelihood security of tribal people, KVKs under ICAR-ATARI, Jodhpur conducted various activities including crop farming, horticulture, animal husbandry, vocational trainings, demonstrations etc. throughout the year for providing direct benefit to the tribal farm families. During 2016-17, KVKs of this Zone created 160 numbers of assets in the form of sprayer, plough, thresher, Rotavator, Maize planter, Disc harrow, cultivator etc. for the tribal people in the concerned district. The KVKs conducted 122 On-Farm-Trials (OFT) and 7293 Front Line Demonstrations (FLD) on different improved technologies. The KVK scientists trained about 0.66 lakh tribes including youths, farmers, farm women and 734 extension personnel. A total of 3.09 lakh tribal farmers participated in different extension activities. In addition, tribal KVKs under this Zone produced 290 tonnes various seeds, 32.9 lakh planting materials and 9647 livestock strains and fish fingerlings in the tribal areas.



Field Day on FLDs Maize under TSP





HUMAN RESOURCE DEVELOPMENT

In broadest interpretation, capacity building encompasses human resource development (HRD) as an essential part of development. HRD focuses on a series of actions directed at helping participants in the development process to increase their knowledge, skills, and understandings and develop attitudes needed to bring about desired developmental change? Generally training & capacity building are generally used interchangeably. Training is just one element of capacity development which focuses on providing skills for specific problems. Capacity building encompasses whole range of activities designed to empower individuals and institutions including the analysis of policy

contexts, awareness building, institutional adjustments, policy research, policy immersion and more. For effective coordination, implementation, monitoring and evaluation of trainings at ICAR institutes including ICAR ATARI, Jodhpur, has assessed training needs of employees involving in skill development of employees.

During 2016-17, 10 training for Scientific, Technical, Administrative & Financial staff were planned (Table 1). Out of total training planned, 100% realization of planned trainings was achieved. The financial targets & achievement has been presented in Fig-2.

Table 1 Physical and Financial Target and Achievements

| S. No. | Category | Total No. of Employees | No. of trainings planned for 2016-17 as per ATP | % realization of trainings planned during 2016-17 |
|-----------|--------------------------|---------------------------|---|---|
| 1 | Scientist | 4 | 3 | 100 |
| 2 | Technical | 1 | 4 | 100 |
| 3 | Administrative & Finance | 5 | 3 | 100 |
| | Total | 10 | 10 | 100 |



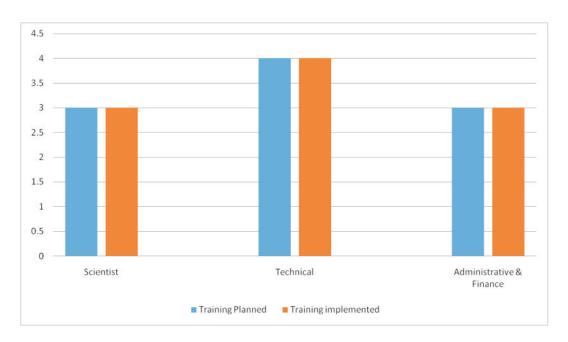


Fig-1 Training planned and employees undergone in training during year 2016-17

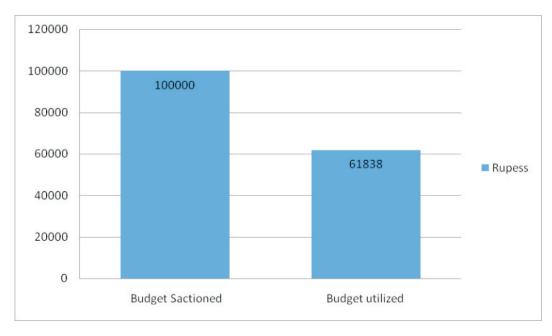


Fig-2 Financial targets and achievements during year 2016-17

Scientists, technical staff, administrative & financial staff were facilitated to develop the skills for overall organizational efficiency. The

area wise trainings for scientific, technical and administrative staff have been depicted in table 2, 3 & 4 respectively.

Table 2 Training attended by Scientists during 2016-17

| S.No. | Name of employee | Designation | Discipline/Section | Training attended |
|-------|------------------|-------------|-----------------------|--|
| 1 | Dr. Srinivas A | Scientist | Agriculture Extension | Training on RTI online portal of DOP&T i.e. RTI request & Appeal management system at ICAR institutes at Dop&T, New Delhi on 21st Oct., 2016. |
| 2 | Dr. R.B. Kale | Scientist | Agriculture Extension | Training on Good practices in extension research & evaluation at ICAR-NAARM, Hyderabad during 29 th Nov. to 2 nd Dec., 2016. |
| 3 | Dr. R.B. Kale | Scientist | Agriculture Extension | Training programme for HRD nodal officers at ICAR-NAARM, Hyderabad on 13-15 th Feb., 2017. |

Table 3 Training attended by Technical staff during 2016-17

| S.No. | Name of employee | Designation | Discipline/Section | Training attended |
|-------|--------------------|-------------|--------------------|---|
| 1 | Mr. P. K Satapathy | ACTO | Computer | Training on Computer Application on 18 to 23 rd July 2016 at IASRI, New Delhi. |
| 2 | Mr. P. K Satapathy | ACTO | Computer | Training on Cyber Security on 28 th Sept. to 5 th Oct. 2016. |
| 3 | Mr. P. K Satapathy | АСТО | Computer | Training on Analysis of Experimental data during 20-25 th Feb., 2017 at ICAR-NAARM, Hyderabad. |
| 4 | Mr. P. K Satapathy | ACTO | Computer | Training on KVK portal on 9 th March, 2017 at ICAR-IASRI, New Delhi. |

Table 4 Training attended by Administrative & Finance staff during 2016-17

| S.No. | Name of employee | Designation | Discipline/Section | Training attended |
|-------|-------------------|-------------|--------------------|--|
| 1 | Mr. Permod Sharma | JAO | Finance | Workshop on Pension & retirement benefits at ISTM, New Delhi 4-7 April 2016. |
| 2 | Mr. N. S. Gehlot | AAO | Administration | Training on E- Procurement at ICAR-NAARM, Hyderabad on 27-28 April 2016. |
| 3 | Ms. Aruna Sharma | F&AO | Finance | Sexual harassment of women at work place from 18-19 Aug., 2016. |



Participation of Scientists in Training/Workshop/Seminar/Meetings etc. during 2016-17

| S. No. | Scientific Staff | Activities | Period |
|--------|--------------------------------|---|----------------------------------|
| 1. | Dr. S. K. Singh, Director | AICRP Pearlmillet Brainstorming held at ICAR-CAZRI, Jodhpur on 18.06.2016 under the Chairmanship of Hon'ble DDG (Crop Science). | 18.06.2016 |
| | | Extension Education Council Meeting at AU, Mandore, Jodhpur on 07.07.2016. | 07.06.2016 |
| | | AICRP Arid Fruits Meeting at CIAH-Bikaner on 06.03.2017. | 06.03.2016 |
| | | Division Meeting at ICAR, New Delhi 4-6 October, 2016, 05.01.2017 and 18-20 January, 2017. | 18-20 January, 2017 |
| | | National Workshop of ASCI at NASC Complex on 05.01.2017. | 05.01.2017 |
| | | Directors' Conference during 14-15 January, 2017. | 14-15 January, 2017 |
| | | Annual Workshop of CFLDs during 14-15 May, 2016 at NASC Complex, New Delhi. | 14-15 May, 2016 |
| | | Field Day on 20.10.2016 at Regional Station, NBPGR, CAZRI Campus, Jodhpur. | 20.10.2016 |
| | | Seed Day on 24.09.2016 at CAZRI, Jodhpur | 24.09.2016 |
| | | Kisan Mela on 21.09.2016 at CAZRI, Jodhpur. | 21.09.2016 |
| | | Institute's Foundation Day on 01.10.2016 of CAZRI, Jodhpur. | 01.10.2016 |
| | | Regional Committee Meeting-VI during 13-14 September, 2016 at CAZRI, Jodhpur. | 13-14 Sept., 2016 |
| | | All India RAPs Meeting at Jaypee Sidhanth Hotel, New Delhi from 25-26 May, 2016 as a Resource Person under ICAR-AgMIP-ICRISAT collaborative project. | 25-26 May, 2016 |
| | | ASPEE Foundation Meeting at Mumbai on 24-26 February, 2017. | 24-26 February, 2016 |
| | | Regional Farmers Fair on 18.02.2017 at SKRAU, Bikaner. Hon'ble Minister of Agriculture & Farmer Welfare, Government of India, Sri Radha Mohan Singh was the Chief Guest. | 18.02.2017 |
| 2. | Dr. P. P. Rohilla, PS (LPM) | Kisan Mela organized for creating awareness about Pradhan Mantri Fasal Beema Yojna on 4th April, 2016 at KVK Sriganganagar and on 5th April, 2016 at KVK Sangaria. | 4 to 5 th April, 2016 |



| S. No. | Scientific Staff | Activities | Period |
|--------|------------------|---|--------------------------------|
| | | Meeting to deliberate and develop a road map on, "Research priorities, partnership and policies for increasing production and productivity of pearl-millet in A1 Zone" held at CAZRI Jodhpur and organized by All India Coordinated Research Project on Pearlmillet, Mandor, Agricultural University, Jodhpur | 18 th June, 2016 |
| | | Interface Meeting on, "Enhancing the Preparedness of Agricultural Contingencies in Kharif 2016 for Gujarat" .Organized by DAC and ICAR-Central Research Institute for Dryland Agriculture, Hyderabad, Department of Agriculture, Gujarat. Venue: Mahatma Gandhi Labour Institute, Ahmedabad. | 23 rd June 2016 |
| | | Interface Meeting on, "Enhancing the Preparedness of Agricultural Contingencies in Kharif 2016 for Rajasthan". Organized by DAC and ICAR-Central Research Institute for Dryland Agriculture, Hyderabad, Department of Agriculture, Govt. of Rajasthan. Venue: Pant Krishi Bhawan, Jodhpur. Rajasthan. | 4 th July 2016 |
| | | Plant Genome Saviour Award Ceremony at NASC Complex organized by PPV&FRA New Delhi. Sh Radha Mohan Singh, Hon'ble Minister of Agriculture & Farmers Welfare was the Chief guest of the function. | 24 th August 2016 |
| | | Brainstorming workshop on, "Policy Framing for Up-scaling Farm Machinery Custom Hiring Centres (CHCs)" organized by ICAR-CRIDA, Hyderabad under the Chairmanship of Dr K. Alagusundaram, ADG (Agril. Engg.) ICAR New Delhi and Director, CRIDA, Hyderabad | 17 th Oct 2016 |
| | | 5th NICRA Annual workshop at NASC New Delhi organized by CRIDA Hyderabad to present the NICRA APR of 2015-16 and to discuss the Action Plan for 2016-17 for NICRA KVKs under ATARI Jodhpur. NICRA TDC booklet entitled, "NICRA-TDC Salient Achievements of KVKs under ATARI Jodhpur" was released by the Chief Guest in NICRA workshop. | 9 to 10 th Dec 2016 |
| | | Attended an interactive meeting with Director, HODs, PI and 170 Farmers on Farmers FIRST Programme (FFP) at ICAR-CAZRI Jodhpur at C.S. Christian Hall of ICAR-ATARI, CAZRI Campus, Jodhpur. | 9 th Feb 2017 |



| S. No. | Scientific Staff | Activities | Period |
|--------|-----------------------------------|--|---------------------------------|
| | | Attended XIII Agriculture Science Congress on, "Climate Smart Agriculture" jointly organized by UAS Bengaluru and NASC New Delhi. One research paper was presented by me. | 21 to 24 th Feb 2017 |
| 3. | Dr. M. S. Meena, PS (AE) | "Accelerating Technology Dissemination through Effective Linkages with KVKs" during AICRP-RM group meeting at UP Pt. Deen Dayal Upadhyaya Pashu Chikistsa Vigyan Viswavidyala evam Go Anusandhan Sansthan, Mathura. | 7.8.2016 |
| | | National Review Workshop on CFLDs on oilseeds held at IGKV, Raipur, India. | 17-18 February, 2017 |
| | | All India RAPs meeting at Jaypee Siddhartha Hotel, New Delhi under ICAR-AgMIP-ICRISAT collaborative project. | 23-27 May 2016 |
| 4. | Dr. R. B. Kale, Scientist (AE) | Roundtable brainstorming meeting on "Developing Transparent Performance Indicators on Functioning of KVKs" at NASC Complex, New Delhi organized by IFPRI. | 05.08.2016 |
| | | National Workshop on Skill Development in Agriculture at NASC Complex, Pusa, New Delhi organized by Department of Agriculture, Cooperation and Farmers' Welfare. | 05.01.2017 |
| | | Training Programme on "Competency Enhancement Programme for Effective Implementation of Training Functions by HRD Nodal Officers of ICAR" organised by NAARM, Hyderabad in collaboration with Centre for Good Governance (CGG), Hyderabad. | 13-15 February, 2017 |
| | | Workshop on Good Practices in Extension Research and Evaluation during 29 Nov-2 Dec 2016 at NAARM, Hyderabad. | 29 Nov to 2 Dec 2016 |





BUDGET AND STAFF

The details on funds allocation and utilization with respect to ATARI, KVKs, and Directorates of Extension Education under different sub-heads for the period 2016-17 are shown in table 5.1. A total of 9308.00 lakh was allocated during the period under report out of which 7825.22 was spent.

5.1 Budget position at ATARI, DEEs and KVKs (2016-17)

5.2 Staff strength at ICAR-ATARI, Jodhpur

Total sanctioned staff strength of Zonal Project Directorate, Zone-VI, Jodhpur is 18, out of which 11 have been filled up (Table 5.2).

5.3 Staff position existing

Existing staff position of the ICAR-ATARI, Jodhpur as on March 31, 2017 is presented in table 5.3.

Table 5.1 Fund allocation & utilization at ZPD, DEEs and KVKs for 2016-17(Rs. In lakhs)

| Head | ATARI, Jodhpur | | KVKs | | DEEs | | Total KVKs+DEEs | | Grand | Total |
|---------|----------------|--------|---------|---------|-------|-------|--------------------|---------|---------|---------|
| | RE | Exp. | RE | Exp. | RE | Exp. | RE | Exp. | RE | Exp. |
| Capital | 169.70 | 169.44 | 1215.30 | 860.11 | 0.00 | 0.00 | 1215.30 | 860.11 | 1385.00 | 1029.55 |
| Salary | 124.50 | 124.17 | 5967.50 | 5145.09 | 0.00 | 0.00 | 5967.50 | 5145.09 | 6092.00 | 5269.26 |
| General | 46.00 | 45.10 | 1741.90 | 1445.89 | 43.10 | 35.42 | 1785.00 | 1481.31 | 1831.00 | 1526.41 |
| Total | 340.20 | 338.71 | 8924.70 | 7451.09 | 43.10 | 35.42 | 8967.80 | 7486.51 | 9308.00 | 7825.22 |

Table 5.2 Staff strength at ICAR-ATARI, Jodhpur (31.03.2017)

| S. No | Posts/Designation | Sanctioned | Filled | Vacant |
|-------|--|------------|--------|--------|
| 1. | Director | 01 | 01 | - |
| 2. | Principal Scientist (Agricultural Extension) | 01 | 01 | - |
| 3. | Senior Scientist (Livestock Production & Management) | 01 | 01 | - |
| 4. | Senior Scientist (Agricultural Extension) | 01 | - | 01 |
| 5. | Senior Scientist Agricultural Economics) | 01 | - | 01 |
| 6. | Scientist (Agricultural Extension) | 01 | 01 | - |



| S. No | Posts/Designation | Sanctioned | Filled | Vacant |
|-------|-------------------------------------|------------|--------|--------|
| 7. | Scientist (Agronomy) | 01 | - | 01 |
| 8. | T-6 (Computer) | 01 | 01 | - |
| 9. | Assistant Finance & Account Officer | 01 | 01 | - |
| 10. | Assistant Administrative Officer | 01 | 01 | - |
| 11. | Junior Accounts Officer | 01 | 01 | - |
| 12. | Assistant | 01 | - | 01 |
| 13. | Private Secretary | 01 | - | 01 |
| 14. | Senior Clerk | 01 | 01 | - |
| 15. | Junior Clerk | 02 | 01 | 01 |
| 16. | Driver | 01 | 01 | - |
| 17. | Supporting Staff | 01 | - | 01 |
| | Total | 18 | 11 | 07 |

Table 5.3 Staff Position existing (on 31st March 2017)

| Category | Name of Staff | Designation |
|------------------|---------------------|--|
| Director | Dr. S.K. Singh | Director |
| Scientific | Dr. P.P. Rohilla | Principal Scientist (LPM) |
| | Dr. M.S. Meena | Principal Scientist (Agricultural Extension) |
| | Sh. R.B. Kale | Scientist (Agril. Extension) |
| Technical | Sh. P.K. Satapathy | Assistant Chief Technical Officer (Computer) |
| | Sh. Ram Nivas | Driver |
| Administrative | Ms. Aruna Sharma | Finance & Accounts Officer |
| | Sh. N.S. Gehlot | Assistant Administrative Officer |
| | Sh. Permod Sharma | Junior Accounts Officer |
| | Sh. Rajender Benda | Upper Divisional Clerk |
| | Sh. Mukesh Tripathi | Lower Divisional Clerk |
| Supporting staff | | |

5.4 Joining/Transfers/Superannuation/Promotion

• Dr. Srinivas Adehas been transferred to ICAR-ITRI, Rajmundri on 10.03.2017

5.5 Staff position of KVKs

The data base on number of staff sanctioned, in position and posts vacant in

KVKs of Zone-VI during the period under report shown in table 5.5 indicated that 41% posts are vacant. Vacant posts were mostly belonged to SAUs which are going to be filled up during 2017-18 as universities have initiated the process.

Table 5.4 Summary of KVK staff position

| Category | Rajasthan | | Gujarat | | | Zone Total | | | |
|----------------------------|-----------|--------------|---------|-----|-----|-------------------|------|-----|-----|
| | S | \mathbf{F} | V | S | F | V | S | F | V |
| Senior Scientist & Head | 42 | 19 | 23 | 30 | 22 | 8 | 72 | 41 | 31 |
| Subject Matter Specialists | 252 | 135 | 117 | 180 | 136 | 44 | 432 | 271 | 161 |
| Programme Assistant | 126 | 54 | 72 | 90 | 66 | 24 | 216 | 120 | 96 |
| Administration | 84 | 34 | 50 | 60 | 38 | 22 | 144 | 72 | 72 |
| Auxiliary | 84 | 41 | 43 | 60 | 34 | 26 | 144 | 75 | 69 |
| Supporting | 84 | 65 | 19 | 60 | 35 | 25 | 144 | 100 | 44 |
| Total | 672 | 348 | 324 | 480 | 331 | 149 | 1152 | 679 | 473 |

S: sanctioned, f: filled, v: vacant





DIRECTORATES OF EXTENSION EDUCATION

Agricultural extension involves the whole gamut of complex interactions between farmers/farm women, extensionists, input dealers, local traders, etc. and researchers for empowering the farming community. These interactions result in enhancement of productivity and profitability from the limited resources of the farmers. Directorate of Extension Education (DEE) is a nodal agency of State Agricultural Universities (SAUs) for promoting agricultural development in the state. Transfer of agricultural technologies is done through providing training, advisory services and supply of farm information to both extension professionals as well as farmers. DEEs are also involved in assessment, refinement, and transfer of agricultural technologies through on-farm testing and frontline demonstrations. Being a Central part of SAUs, DEEs monitor and evaluate extension programmes of KVKs. DEEs also extend their supports to State Departments through publishing literature on different enterprises of agriculture and allied subjects. Directorate of Extension has multi-disciplinary team of scientists who work in participatory mode in close co-ordination with Department of Agriculture, Animal Husbandry, Horticulture, Forestry, Co-operatives, Panchayat Samities and other agencies engaged for upliftment of socioeconomic status of the rural people.

The broad objectives of DEEs are:

- To develop partnership in diagnosis, identification, prioritization of field problems and their communication to research system of University.
- To impart the trainings to the in-service candidate and functionaries of the line departments of state government and non-governmental organisations.
- To conduct short and long-term vocational trainings for farmers, farm women, youth & school dropouts.
- To assess and refine the latest agricultural technologies through on farm research for its wider replication and adoption, and
- To provide farm advisory/information services including literature for fosterning dissemination process of agricultural technologies.

Ten Directorate of Extension Educations are actively involved in technology backstopping, monitoring and evaluation of the KVKs are functioning out of these, six DEEs are engaged in technology assembling and delivering in a holistic manner in Rajasthan and remaining 4 DEEs are delivering extension services in Gujarat state. State wise distribution of DEEs is given in Table 6.1.



Table 6.1 Director of Extension Education & Technology Backstopping to KVKs

| S. No. | Director's name | SAUs | Technological backstopping for KVKs (no | | | | |
|--------|-------------------|----------------------------------|---|------|-----|----|------------------------------|
| | | | SAU/ CAU | ICAR | NGO | DU | Other educational institutes |
| 1 | Dr. P.L. Nehra | SKRAU, Bikaner (Rajasthan) | 7 | 0 | 1 | 0 | 1 |
| 2 | Prof. G.S. Tiwari | MPUA&T, Udaipur Rajasthan) | 6 | 0 | 1 | 0 | 0 |
| 3 | Dr. Iswar Singh | Agricultural University, Jodhpur | 6 | 2 | 1 | 0 | 0 |
| 4 | Dr. I.N. Gupta | Agricultural University, Kota | 6 | 0 | 0 | 0 | 0 |
| 5 | Dr. N.K. Sharma | SKNAU, Jobner | 7 | 1 | 1 | 0 | 1 |
| 6 | Dr. P.N. Dhuria | RAJUVAS, Bikaner | 1 | 0 | 1 | 0 | 1 |
| 7 | Dr. K.A. Thakkar | SDAU, S.K. Nagar (Gujarat) | 3 | 1 | 3 | 1 | 0 |
| 8 | Dr. Arun Patel | AAU, Anand (Gujarat) | 3 | 1 | 1 | 1 | 0 |
| 9 | Dr. G.R. Patel | NAU, Navsari (Gujarat) | 5 | 0 | 1 | 1 | 0 |
| 10 | Dr. A.M. Parakhia | JAU, Junagadh (Gujarat) | 7 | 0 | 2 | 0 | 0 |

6.1 Human Resource Development

Human resource development of KVK functionaries is an important activity for enhancing knowledge and upgrading skills of

subject matter specialists and Senior Scientist & Heads. During 2016-17, DEEs organized 26 training programmes under capacity development programmes in which 540 participants took part.

Table 6.2 HRD activities organized by DEEs in Zone-VI

| DEEs | Training areas | Trainings (no.) | Participants (no.) | KVKs (no.) |
|---------------------|--|-----------------|--------------------|------------|
| DEE, SKRAU, Bikaner | ICAR Winter School on Use of ICT in Education and Rural Development | 1 | 22 | 10 |
| | One day two Training on Kharif crops for FTAs of KCC, Jaipur | 2 | 50 | 0 |
| | ICAR Short Course on "Trg. and Managerial Skills for Agril. Professionals" | 1 | 20 | 6 |
| | One year Training on Nursery Management | 1 | 25 | 0 |
| | Total (a) | 4 | 97 | 10 |
| DEE, MPUAT, Udaipur | Good Agricultural Practices | 1 | 12 | 7 |
| | Impact Evaluation and Implementation of Extension Programmes | 1 | 13 | 7 |
| | Total (b) | 2 | 25 | 14 |



| DEEs | Training areas | Trainings (no.) | Participants (no.) | KVKs (no.) |
|---------------------|--|-----------------|--------------------|------------|
| DEE,SDAU, Dantiwada | A training on 'Scientific cultivation of maize' at KVK, Sabarkantha during 7-8 Oct., 2016 in collaboration with Research Scientist (Maize), AAU, Godhara | 1 | 27 | 3 |
| | Total (c) | 1 | 27 | 3 |
| DEE, NAU, Navsari | Orientation Programme on "Latest NAU Agricultural Technologies" for NAU Scientists. | 1 | 10 | 5 |
| | Training programme on "Agro textiles for adaptation of climate change" | 1 | 25 | 7 |
| | Training Programme on "Management of Commodity Interest Groups and Farmers Organizations" in collaboration with EEI, Anand. | 1 | 14 | 7 |
| | International Conference on "Food, water, energy nexus in arena of climate change" at AAU, Anand during October 14-16, 2016. | 1 | 5 | 5 |
| | Peripatetic Training Programme on "Knowledge Sharing | 1 | 9 | 5 |
| | Total (d) | 5 | 63 | 29 |
| DEE, JAU, Junagadh | Advances in Horticulture, Animal health and Value Addition | 1 | 29 | 8 |
| | Kharif Pre-seasonal Training | 1 | 30 | 8 |
| | Rabi Pre-seasonal Training | 1 | 30 | 8 |
| | Bio monthly workshop of KVKs | 5 | 91 | 8 |
| | Short Duration Training Programme | 1 | 35 | 8 |
| | Total (e) | 9 | 215 | 40 |
| DEE, AU, Kota | Training concept and design of OFT | 1 | 21 | 6 |
| | Training cum workshop on action plan formation | 1 | 22 | 6 |
| | Total (f) | 2 | 43 | 12 |
| DEE, SKNAU, Jobner | "Communication Skills for Effective Extension Services" | 1 | 25 | 9 |
| | "PRA tools and techniques for SREP development" | 1 | 25 | 8 |
| | Total (g) | 2 | 50 | 17 |
| | Grand Total | 26 | 540 | 131 |

6.2 Workshops/Meetings Organized

The DEEs organized various meetings and workshops for guiding, advising and supervising the activities of KVKs. Details of workshops/

meetings organized by the DEEs in Zone-VI and participation of KVKs are depicted in the table 6.3.

Table 6.3 Workshops/meetings organized by DEEs

| Workshop/meeting conducted | No. of KVKs participated |
|---|--------------------------|
| SKRAU, Bikaner, Rajasthan | |
| Extension Advisory Committee (EAC) meeting (9.6.2016) | 10 |
| Conveners meeting function of Benisar visit by H.E. Governor of Rajasthan (13.10.16) | 2 |
| Farmers First Programme Project Meeting 15.11.16) | 4 |
| Review meeting of KVKs (20.12.16) | 5 |
| Review meeting for Western Regional Agriculture Fair (3.1.17) | 23 |
| Meeting of Monitoring Committee of Regional Farmers Fair (20.1.17) | 7 |
| Review meeting for Western Regional Agriculture Fair (24.1.17) | 37 |
| Meeting of Monitoring Committee of Regional Farmers Fair (24.1.17) | 8 |
| Meeting of Monitoring Committee of Regional Farmers Fair (2.2.17) | 9 |
| Review meeting for Western Regional Agriculture Fair (7.2.17) | 11 |
| Review meeting for Western Regional Agriculture Fair (8.2.17) | 8 |
| Press Conference by Hon'ble V.C., SKRAU, Bikaner for Western Regional Agriculture Fair (14.2.17) | 53 |
| MPUAT, Udaipur, Rajasthan | |
| Workshop of KVKs of MPUAT to finalized On Farm Trial for the year 2016-17 was held on 18 th April, 2016 | 6 |
| 17 th Extension Education Council meeting of MPUAT was held on 22 nd June, 2016 (Hon'ble Vice-Chancellor, MPUAT, Prof. U. S. Sharma, Hon'ble Vice-Chancellor, Kota University, Kota, Prof. P. K. Dashora and Hon'ble Vice-Chancellor, SKN Agriculture University, Jobner Prof. P. S. Rathore, Deans & Directors of MPUAT, Joint Directors and Officers of line department of Agriculture, ZDRs, HODs, Progressive farmers & Farm women) | 7 |
| Review Workshop cum Monthly meeting to monitor activities & progress of KVKs of MPUAT was held at KVK, Banswara, Bhilwara, Chittorgarh, Dungarpur & Pratapgarh on 11 th July, 20 th August, 24 th Sept., 20 th October, 2016 and 20 th January, 2017. | 6 |
| Mid Review Workshop to finalized Annual Action Plan (2016-17) and Progress of KVKs was held on 26 th November, 2016 | 7 |



| Workshop/meeting conducted | No. of KVKs participated |
|--|--------------------------|
| SDAU, Dantiwara, Gujarat | |
| Workshop on 'Agro-Meteorology' on $20^{\rm th}$ August 2016 at Sardar Smruti Kendra, SDAU, Sardarkrushinagar | 8 |
| Workshopn on 'Cotton Production Technology' on 8 th September 2016 at Cotton Research Station, SDAU, Talod Dist.: Sabarkantha | 8 |
| Workshopn on 'Seed Spices Production Technology' on 19 th November 2016 at Seed Spices Research Station, SDAU, Jagudan Dist.: Mahesana | 8 |
| 'State level Mid Review and Planning Workshop' for all KVKs of Gujarat during 30-31 December 2016 at S. D. Agricultural University, Sardarkrushinagar | 72 |
| Workshopn on 'Wheat Production Technology' on 21 st January 2017 at Wheat Research Station, SDAU, Vijapur Dist.: Mahesana | 8 |
| 'Interactive meeting of KVKs' working under SDAU jurisdiction on $1^{\rm st}$ March 2017 at Sardar Smruti Kendra, SDAU, Sardarkrushinagar | 8 |
| 'Meeting of Senior Scientists & Head and SMSs of KVKs working under SDAU jurisdiction for 'Doubling the Farmers' Income' on 15 th March 2017 at Sardar Smruti Kendra, SDAU, Sardarkrushinagar | 8 |
| AAU, Anand, Gujarat | |
| KVK Zonal Workshop | 6 |
| International Conference | 6 |
| AGRESCO Meetings | 6 |
| ZREAC Meetings | 6 |
| Review Meetings | 6 |
| Jai Kisan Jai Vigyan Week Celebration | 6 |
| World Soil Day | 2 |
| Pre Vibrant Agro & Food Processing Megaseminar: Gujarat 2017 | 6 |
| Contingency Planning Meeting (23/6/16) Enhancing the preparedness of Agricultural contingencies in "Kharif"- 2016 for Gujarat | 6 |
| Pandit Deen Dayal Upadhyay Unnat Krishi Shiksha Yojana (5 Days – 5 Training Programme) | 1 |
| NAU, Navsari, Gujarat | |
| ATMA Convergence Quarterly Meetings: An Interface between KVKs, ATMA, DAOs and NAU Scientists. | 7 |
| Zonal Research and Extension Action Committee (ZREAC) meeting (25th and 26th) | 7 |
| Three Monthly Review meetings of KVKs | 7 |
| Two meetings under Seed hubs project | 2 |
| Contingency plan meeting | 5 |
| JAU, Junagadh, Gujarat | |
| Review Meeting of SS&H of KVKs | 8 |
| Bio monthly workshop of KVKs | 8 |
| Workshop on Recent Extension Approaches for Effective transfer of Technologies (EEI, ANAND & DEE, JAU, Junagadh) | 8 |
| Training Methods for Trainers of extension Institutes (MANAGE) | 8 |



| Workshop/meeting conducted | No. of KVKs participated |
|---|--------------------------|
| AU, Kota, Rajasthan | |
| KVKs monthly meetings | 6 |
| SKNAU, Johner, Rajasthan | |
| Two days District Level Seminar at DEE, SKNAU, Johner | 11 |
| Review meeting of GRAM 2016 at DEE, SKNAU, Johner on 29.07.2016 | 11 |
| Review meeting of GRAM 2016 at DEE, SKNAU, Jobner on 05.10.2016 | 11 |
| Review meeting of GRAM 2016 at DEE, SKNAU, Jobner on 04.11.2016 (University's participation in GRAM 2016) | 11 |
| Meeting on purchase and utilize the budget allotted to KVKs at DEE, SKNAU, Johner $(27.02.2017)$ | 8 |
| Monthly meeting of KVKs at DEE, SKNAU, Johner (20.02.2017) | 11 |
| Monthly meeting of KVKs at DEE, SKNAU, Johner 22.03.2017) | 11 |

6.3 Visits of Directorate of Extension Education Personnel to KVKs

During 2016-17, Directorate of Extension Education personnel made 459 official visits to KVKs for distinguished purposes (Fig. 6.1). The maximum visits (106) made for training programmes of KVKs followed by 77 visits for workshops/seminar of KVKs, 74 visits for field days, 57 visits were for SAC meetings and 22 visits were for technology week celebrations of

KVKs and 123 visits for various activities of KVKs.

6.4 Publication and Updating of Technology Inventories

Assessing demonstrations of agricultural technologies for its best suitability in local conditions is one of the important functions of DEEs. In the current year, 207technology inventories published by DEEs, while27 technology inventories updated for benefit of farming community (Fig. 6.2).

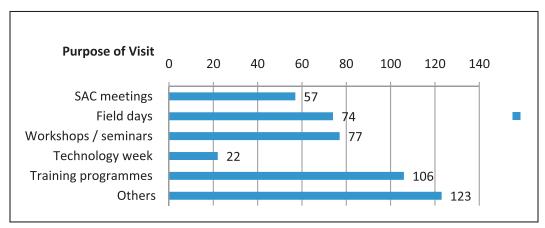


Fig. 6.1 Visits of Directorate of Extension Education personnel to KVKs





DEE, JAU, Junagadh visiting at KVK farm



Interaction of Director ATARI, Jodhpur with KVK staff of Bikaner-I

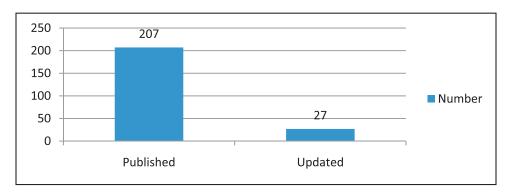


Fig. 6.2 Technology inventory published & updated by DEEs

6.5 Technological Products Provided to KVKs

DEEs provided technological products to KVKsunder their jurisdiction in Zone-VI as given in fig. 6.3. Seed materials supplied to44 KVKs, planting material to 30 KVKs, Bio-

products to 26 KVKs, Livestock breed to 14 KVKs, Livestock product to 20 KVKs, Poultry breeds and poultry product to 14 KVKs. The details about technological products provided to KVKs are depicted in fig. 6.3.

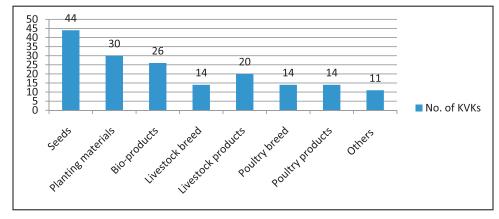


Fig. 6.3 Technology/planting material/breeds/products provided to KVKs



CHAPTER

AGRICULTURAL TECHNOLOGY INFORMATION CENTRE

Agricultural Technology Information Centre (ATIC) is a single window delivery system which provides the services and information on recent technologies to the farmers for the areas in which the concerned institute is involved. This "single window" also acts as a delivery system for the technological products available at institute of State Agricultural University to the farmers and other interested groups as process of innovativeness in technology dissemination at the institute level. It also facilitates the farmers to access the institutional resources available in terms of technology, advice, technology products, etc. for reducing technology dissemination losses; and will provide mechanism for feedback from the users to the institute. Presently seven ATICs are working in the Rajasthan and Gujarat (Table 7.1). The details of activities undertaken

by the ATICs during 2016-17are listed in Tables 7.2 to 7.7, respectively.

7.1 Farmers' visit to ATICs

A total number of 36622 farmers had visited ATICs to get the technology information followed by 62759 farmers to purchase technology products developed by research institutes or agricultural universities and 8421 farmers visited for diagnosis of plant, soil and animal etc. Details of farmers' visits and the purpose of visits to ATICs are given in Table 7.2.

7.2 Operational Facilities in ATICs

ATICs are having the facilities of exhibition/technology museum and farmers' feedback register. Six ATICs are having reception counter and sales counter. Touch

| Table 7.1 ATICs | functioning i | n Rajasthan | and Gujarat |
|-----------------|---------------|-------------|-------------|
|-----------------|---------------|-------------|-------------|

| S. No | Name of ATIC | Host Institute | ATIC Manager |
|-------|-------------------|-----------------------|-------------------------|
| 1. | CAZRI, Jodhpur | CAZRI, Jodhpur | Dr.Bhagwan Singh |
| 2. | SKRAU, Bikaner | SKRAU, Bikaner | Dr. Meenakshi Chaudhary |
| 3. | MPUA&T, Udaipur | MPUA&T, Udaipur | Dr. I.J. Mathur |
| 4. | SDAU, S. K. Nagar | SDAU, S. K. Nagar | Dr. K.S. Patel |
| 5. | AAU, Anand | AAU, Anand | Dr. Arun Patel |
| 6. | NAU, Navsari | NAU, Navsari | Dr. G.B. Kalariya |
| 7. | JAU, Junagadh | JAU, Junagadh | Dr. B.L. Parmar |



Table 7.2 Farmers' visits to ATICs

| S. No | Purpose of visit | Number of farmers' visited |
|-------|---|----------------------------|
| 1 | Technology Information | 36622 |
| 2 | Technology Products | 62759 |
| 3 | Others (Diagnosis of plant, soil and animals) | 8421 |

screen Kiosk, cafeteria facilities are available in three ATICs. The details of operational facilities available ATICs are shown in Table 7.3.

7.3 Technology information provided by ATICs

All the ATICs are responsible to provide latest information to the farmers on the various components like varieties/hybrids, pest and disease management, agro-techniques, soil and water conservation, post harvest technology and value addition, animal husbandry and fisheries. The number of farmers benefiting by the information provided on these commodities through Kisan Call Centre/other phone calls from farmers (12030), Video Shows (3320), letters received and replied (496), training to farmers / technocrats / students (1782), others

(5683). The details of technology information provided by ATICs are depicted in Table 7.4.

7.4 Publications (Print & Electronic Media)

ATICs of Rajasthan and Gujarat are actively involved in distribution of information to the farmers through publications viz. print and electronic media related to agriculture and allied sectors. Various publications benefited the large number of farmers viz. books (2227), technical bulletins (43781), technology inventory (29) and others (7599)like newsletters, folders, leaflets, etc. The details of publications (print & electronic media) provided by ATICs are shown in Table 7.5.

7.5 Technology Products

ATICs provided technology products like seeds (1725.38 q) and planting materials 361117

Table 7.3 Operational Facilities in ATICs

| S. No. | Particulars | Availability (Please $\sqrt{\text{mark}}$) | Number of ATICs |
|--------|--------------------------------|---|------------------------|
| 1 | Reception counter | $\sqrt{}$ | 7 |
| 2 | Exhibition / technology museum | $\sqrt{}$ | 7 |
| 3 | Touch screen Kiosk | $\sqrt{}$ | 2 |
| 4 | Cafeteria | $\sqrt{}$ | 5 |
| 5 | Sales counter | \checkmark | 7 |
| 6 | Farmer's feedback register | \checkmark | 7 |

ICAR - ATARI

Table 7.4 Technology information provided by ATICs in Zone- VI

| Information | No. of No. of Farmers benefited | Category of information | | | | | | | |
|---|---------------------------------|-------------------------|------------------------|-------------------------|----------------------------|---------------------|--|--|---|
| category | | | Varieties / hybrids | Pest manag- ement | Disease manage- ment | Agro- techniques | Soil and water conser- vation | Post harvest technology and Value addition | Animal husban- dry and fisheries |
| Kisan Call Centre / other Phone calls from farmers | 7 | 12030 | 3254 | 2315 | 1978 | 1132 | 1516 | 794 | 1519 |
| Video shows | 6 | 3320 | 707 | 687 | 574 | 321 | 328 | 393 | 310 |
| Letters received | 6 | 496 | 112 | 78 | 109 | 72 | 65 | 38 | 22 |
| Letters replied | 6 | 496 | 112 | 78 | 109 | 72 | 65 | 38 | 22 |
| Training to farmers / technocrats / students | 5 | 1782 | 139 | 307 | 302 | 270 | 258 | 51 | 276 |
| Others | 3 | 5683 | 1869 | 1793 | 988 | 392 | 238 | 245 | 158 |

Table 7.5 Publications (Print & Electronic media) provided by ATICs in Zone-VI

| S.No | Particulars | Number sold | Revenue generated (Rs.) | Farmers benefited |
|------|-------------------------------|-------------|-------------------------|-------------------|
| 1 | Books | 2227 | 24440 | 7649 |
| 2 | Technical bulletins | 43781 | 0 | 15536 |
| 3 | Technology Inventory | 29 | 0 | 29 |
| 4 | CDs | 2057 | 0 | 2057 |
| 5 | Others (Leaflets and Folders) | 7599 | 74550 | 9899 |

nos.), poultry (2290 nos.) and bio products (1.78 q) to 19715, 28495, 0 and 17 number of farmers, respectively. The details of technology products provided by ATICs are given in Table 7.6.

7.6 Technology services

ATICs provided technology services like soil and water testing, plant diagnostics, services to line departments and others (animal treatment



Table 7.6 Technology Products provided by ATICs

| S. No | Particulars | Quantity | Unit of quantity | Value (Rs.) | Number of farmers benefited |
|-------|--------------------|----------|------------------|-------------|-----------------------------|
| 1 | Seeds | 1725.38 | Quintal | 14727129 | 19715 |
| 2 | Planting materials | 361117 | Numbers | 4421686 | 28495 |
| 3 | Poultry | 2290 | Numbers | 991500 | 0 |
| 4 | Bio-products | 1.78 | Quintals | 890 | 17 |

and FLD) benefiting 9452, 1893, 4349 and 25 number of farmers, respectively. The details of

technology services provided by ATICs are narrated in Table 7.7.

Table 7.7 Technology services provided by ATICs in Zone-VI

| S. No | Particulars | Number of farmers benefited |
|-------|------------------------------|-----------------------------|
| 1 | Soil and water testing | 9452 |
| 2 | Plant diagnostics | 1893 |
| 3 | Services to line departments | 4349 |
| 4 | Others, if any | 25 |



Touch screen installed at ATIC, Navsari





ON FARM TESTING

Importance of location specificity in development of appropriate technology, keeping agro-ecological, socio-economic and cultural parameters in view has been fully exploited. This has paved way for technology assessment in different micro environment to suit varied situations through participatory approach by improving scientists- farmers linkages. The multi-disciplinary team of scientists of the centres and farmers involved in different micro farming situations jointly decided in nature of interventions in fully participatory mode. The process of technology integration, therefore, is of paramount importance for increasing the farm output with productivity, stability, sustainability and equitability consideration. The details of interventions for different fields, viz. crops vegetable crops, fruit crops, plantation crops, fodders, spices livestock, mushroom, apiary etc. taken by each KVK are presented in according to the nature of intervention. Another noticeable feature of interventions is the priority for meeting domestic needs of food, fuel, fodder, economic viability and suitability of technology within households recourses; stability of production and sustainability of technology in small production system. The results of On-Farm Testing will help in extrapolation for deciding the recommendations domains of different technology/technology modules.

Varietal Assessment

Fenugreek is the important seed spice crop of Barmer district after cumin. Productivity of Fenugreek in the district is low. The reason behind this may be due to varieties grown by the farmers are not suitable for this KVK Barmer-I took up On-Farm area. Trials (OFT) on assessment of different varieties of fenugreek. The comparative performance of new variety of Fennel AFG-4 was studied vis-a-vis common farmer's variety under prevailing farming situation. The results indicated that the improved variety i.e. AFG-4 recorded average yield of 956 kg/ha which was 17.73 and 38.75 per cent higher than that obtained yield with RMT-1 and local variety, respectively. The improved variety i.e. AFG-4 gave higher Net return of 11653 Rs/ha with cost benefit ratio 1.59 as compared to other varieties. Farmers





- of same villages have fully convinced with size of grain, colour, maturity period and compatibility with existing situations. Seeds of variety AFG-4 have been kept for next rabi season large scale multiplication by partner farmers and farmer-farmer exchange in same and nearby villages.
- KVK Dungarpur conducted varietal assessment of fennel using local selection -Abu Sauf (T1), Ajmer Fennel-1 (T2) and Ajmer Fennel-2 (T3) varieties. It was observed that Ajmer Fennel-2 was high yielder (31.40q/ha-1) followed by Ajmer Fennel-1 (25.40q/ha-1) and local selection – Abu Sauf (20.16q/ha-1), respectively. Further, net returns from (T3) Ajmer Fennel-2 was also the highest (Rs 195000/- and B:C ratio 8.84) as compared to (T2) Ajmer Fennel-1 (Rs 153125 with B:C ratio 7.72) and (T1) local selection - Abu Sauf (Rs 125625 and B:C ratio 5.29). Hence, Ajmer Fennel-2 variety produced good seedlings and better performance of transplanting, fennel seed are greenish, more number of picking fennel head and maximum yield than other varieties.



OFT on Fennel, KVK, Dungarpur

KVK Kutch II assessed low yield of mustard due to salinity problem. KVK conducted assessment trails on new salinity tolerant mustard variety (CS 52). T1-farmers practice to use old variety (GM-2) which is not salinity tolerant and T2-Salinity tolerant variety CS 52. Net return was also higher (Rs.78000/ha) with B:C ratio of 3.52 followed by farmers practice (Rs.59500/ha with B:C ratio 3.13). The yield data indicate that farmers obtained 25.00 q/ha in improved variety over local check (GM-2) variety of mustard. Overall performance of variety is appreciable and farmers have assured to use seeds of this variety in coming rabi season.



kVK, Udaipur conducted an OFT to assess alternate suitable mustard variety for the area. Three varieties of mustard, viz. Pusa Jai Kisan, Laxmi and RH-749 were assessed at the fields of 10 farmers. Laxmi was found to be most suitable with yield of 15.9 q/ha in comparison to RH-749 (15.6 q/ha) and Pusa Jai Kisan (13.8 q/ha). The net return was also found to be highest with Laxmi (Rs. 32000/ha), although RH-749 also provided



similar returns (Rs. 31000/ha) hence it can be adopted as an alternate variety for mustard in the region.



Maize is one of the staples in the diet of the people of Udaipur region. But as it isn't rich in amino acids namely lysine and tryptophan, the diet of the people, especially children remains deficient in protein thus causing wet malnutrition. Quality protein Maize is rich in these amino acids and thus can prove to be a more nutritional choice. KVK, Udaipur conducted an on farm trial to assess the suitable variety of QPM in the region. Two varieties namely Pratap QPM Hybrid 1 and HQPM 5 were assessed. Pratap QPM Hybrid-1 was found to be more suitable with yield of 30.2 q/ha and net returns of Rs. 11000/ha. with C:B ratio



- 1:1.35. However, the performance of HQPM-5 (yield 28.5 q/ha, net returns Rs. 10000/ha, C:B ratio 1:31) was also found to be similar.
- Udaipur is most suitable for vegetable crops cultivation. However, farmers do not obtain optimum yield and income from vegetables. Due to high incidence of Yellow Mosaic virus (YVMV) in presently grown varieties of Okra, the productivity of the cop is low. KVK (Udaipur) conducted On-Farm Trials on identifying most suitable variety of Okra for Udaipur region. Comparison of the yield of three varieties of okra, viz. Karina, Mahyco28 and JKOH – 7315 was done with the variety used by the farmers i.e. mahyco 10. JKOH - 7315 was found to be most suitable with the highest green fruit yield of 78.1 q/ha as compared to mahyco 28 (70.9) q/ha), karina (52.3 q/ha) and mahyco 10 (48.9 q/ha). The C:B ratio was also highest in JKOH-7315 (1:2.68).
- Chilli (Capsicum annum L.) is an important condiment and a cash crop of the area but its productivity is quite low. Among several factors, lack of improved varieties is the main cause for getting higher production. A few high yielding varieties have been released and recommended for cultivation in different locations. Farmers are growing the local variety with poor yield. Therefore, the OFT was undertaken by KVK Udaipur to find out suitable variety of chilli suitable for the region. Three varieties were assessed viz., Star-2, Sitara and Priya with the variety used by farmers. Among the three varieties



of Chilli, sitara variety proved the best (70.9 q/ha) followed in order to priya (70.00 q/ha) and Star-2 (60.30 q/ha) size of fruits of chilli also attracted majority of farmers in same village.

• KVK Valsad conducted varietal assessment trials of Paddy using Farmer's variety, GNR-2, GAR-13 varieties. The results of the trial indicated that new variety of Paddy GAR-13 earned the maximum net returns (Rs 26135/-yielding 37.01 q/ha with B:C ratio 1.9) followed by GNR-2 (Rs 16550/- yielding 30.52 q/ha with B:C ratio 1.6) and local variety (Rs 13485 yielding 21.95 q/ha with B:C ratio 1.4), respectively. Farmers were satisfied with the results of GAR-13 new improved Paddy variety.





• KVK Valsad conducted varietal assessment trials on chickpea using local Farmer's practices, GG - 2 PKV-2 recommended varieties of SAUs. The result shows that the Gram variety PKV-2 gave 1434 Kg/ha yield as compared to GG-2 (1340 Kg/ha) and Local variety (986 Kg/ha). Also the net return of Rs. 69,567 per ha. as compare to the GG-2 of Rs. 59,434 per ha and local variety with net return of Rs. 40,450 per ha. Farmers have kept seeds of PKV-2 for next year sowing (rabi 2017-18).



Integrated (Balanced) Nutrient Management

The agro-ecosystem analysis from most of the districts of Rajasthan & Gujarat clearly indicates that farmers are not applying fertilizers in balance does. The improper fertilizer includes only nitrogenous fertilizers. Further micronutrients and bio-fertilizers by and large, are missing. Consequently the productivity of crops is low. To overcome this cause On-Farm Trials were taken up at several locations by KVKs and results are as follows:

 KVK Ahmadabad assessed the performance of leaf color chart for fertilizer management in Paddy over Farmers practices; Recommended dose of fertilizers 100:25: 00
 N: P: K at the time of Basal (40% N &



100% P), Tillering (40% N) and Panicle stage (20% N) and Recommended dose of Fertilizers as per Leaf color chart (100:25: 00 N: P: K, Basal (40% N & 100 % P) and remained dose of N apply as per LCC. Results revealed that using LCC paddy yield (6160kg/ha) was increased (18.2% & 15.51%) as compared to recommended practices of fertilizer (6050kg/ha) and farmers' practices (5333 kg/ha), respectively. The grain yield of paddy with recommended dose of fertilizers as per leaf color chart increased by 18.2 percent over farmers practices.

• KVK Bharuch assessed low yield of Bt cotton due to micronutrient deficiency in soil. The soils were analyzed for nutrient status and based on status treatments, recommended dose of Fertilizers (RDF) 200:40:00 kg NPK/ha was assessed with RDF + Basal Application of FeSO4 @ 50 kg/ha+ ZnSO4 @ 25 kg/ha +MgSO4 @ 50 kg/ha. The results revealed that under cotton yield was higher (16.80 q/ha) with more B:C ratio (2.81) as compared to T-1 (2.52 B:C ratio). The flower & balls droppings were also reduced with application of micronutrient in cotton.



An assessment trial were conducted by KVK Bharuch to enhance pigeon pea yield through application of recommended dose of Fertilizers (RDF) 25:50:00 kg NPK/ha was assessed with T2: RDF + Four Spray of 1 % Banana Pseudo stem Enriched Sap (Before flowering Two spray at interval 15 days and at the time of the pod setting interval 15 days). Data analysis pointed out that pigeon pea yield under groups (16.25 q/ha) was 10.03 % higher than T1 group (14.62 q/ha). Net profit earned was the highest in banana sap application Treatment (Rs 45305 with B: ratio 2.84) as compared Farmer practice (Rs 38900 with B:C ratio 2.62). The profuse vegetative growth was observed in banana and farmers are ready to adopt the same.



• An assessment trial was conducted by KVK Bharuch to enhance Brinjal yield. Under T-1 Recommended Dose of Fertilizers (RDF) 50:37.5:37.5 kg NPK/ha while under T-2 RDF (50:37.5:37.5 kg NPK/ha) + Spraying of banana sap @ 1 % thrice at peak flowering stage, fruit set and fruit development stage. The result revealed that under T2 brinjal yield was higher (26.30 t/ha) and increased 17.30%. Maximum net return of Rs 92050/ha with more B:C ration



(2.51) as compare to T1 (2.18 B:C ration). The flower reduced drop and better fruit quality. This yield advantage is fairly high incentive for the farmers to continue this dose of fertilizers in brinjal.



• An assessment trial was conducted by KVK Bharuch to enhance watermelon yield. Under T-1 Recommended Dose of Fertilizers (RDF) 100:50:50 kg NPK/ha while under T-2 RDF (100:50:50 kg NPK/ha) + 1.0 % Banana Pseudo stem Enriched Sap, (Before flowering One spray, second spray at time of flowering time, Third and fourth the fruit setting time) + Bio-fertilizer (Azotobacer & PSB). The result revealed that under T2 water melon yield was higher (46.10 t/ha) and percentage increased yield was 15.37%. Maximum net return of Rs 1,34,640/ha with



- more B: C ratio (2.40) as compared to T1 (2.08 B: C ration). The fruit setting and fruit quality is good. This intervention has been accepted by farmers for large scale application.
- + Citric acid to manage chlorosis in groundnut leaves was assessed by KVK Churu I. Farmers have shown keen interest towards usefulness of this intervention. Results revealed that yield under T3:10 ton FYM /ha + 0.5% FS+ 0.1%Citric acid (Foliar application at 40 and 60 DAS) increased by 29.05% (34.11q/ha) with B:C ratio 3.25 over T2 (32.29q/ha) with B:C ratio of 3.08 whereas Farmers practice yields was reported 26.43q/ha with B:C ratio of 2.54.



potassium fertilization in calcareous soil for Kharif groundnut during 2016-17. In the farmers practices (control), application of potassium @ 50 kg/ha as basal in addition to recommended dose of fertilizer (12.5:25. N:P2O5 kg/ha) and in application of potassium @ 50 kg/ha in two split (i.e. 1/2 as basal + ½ at 30 DAS) in addition to recommended dose of fertilizer (12.5:25.



N:P2O5 kg/ha). The results revealed as 3.36 B:C ratio with 26.95 q/ha yield compared to T3 & Farmers practices and net profit was reported in I, II & local as Rs. 83396/-, 77066/- & 67891/- respectively.



• KVK Junagadh assessed the technology of INM to know the effect of multi micronutrients formulation on wheat during Rabi 2016-17. Farmers practice, application of multi micro-nutrients mixture grade-V@40 kg/ha besides recommended dose of fertilizer (120:60 N:P₂O₅ kg/ha) and foliar spray of multi micronutrient grade IV at 30, 45 and 60 DAS. It was observed that wheat yield under II & III treatment having significant differences compared to farmer practice. Results revealed the wheat yield under T2 & T3 was increased by 23.06%



(47.92q/ha) & 22.21% (47.59q/ha) respectively over farmer's practice (38.94q/ha). Whereas, B:C ratio & net return was received better in T3 (3.65 & Rs. 56134/-) compared to second & Farmer practice.

A OFT was conducted by KVK Kutch II on effect of potassium and gypsum on yield and quality of groundnut. The Problem was observed that high proportion of unfilled pods. The treatment was Farmer practice-Application of DAP 100 kg/ha, application of Recommended practice RDF (25-50 NP kg /ha) + gypsum 500 kg/ha and application of K2O 50 kg/ha were used in this trial on groundnut. Results of the trial revealed that application of K2O 50 kg/ha in groundnut 30.81% higher yield was obtained (22.50 q/ha with net return Rs. 81370/ha and B:C ratio 3.20) which is economical and beneficial over farmers practice (T1-17.20q/ha with net return Rs. 54400/ha and B:C ratio 2.81, T2-19.80q/ha with net return Rs. 70800/ha and B:C ratio 3.18) i.e. higher with the application of recommended practice RDF (25-50 NP kg /ha) + gypsum 500 kg/ha +K2O 50 kg/ha.





• An assessment trial was laid out by KVK Valsad to assess effect of micronutrient on fruit setting and yield of Mango with treatments, Farmer practices (750:150:750 gm/ tree) + 100kg FYM, application of: RDF + NAA (20ppm) + 2% Urea and RDF + NAA (20ppm) + 2% Urea + 3 Foliar spray of 0.1% borax + 0.2% ZnSO4. Low fruit/flower dropping with good quality and highest yield recorded in T2 with BCR (3.73) and yield 109.68 q/ha) compared to T2 (3.50) and Farmer practice i.e T1 (3.14 BCR).



 On-Farm Trials was conducted by KVK-Valsad to assess the use of liquid biofertiliser enriched vermicompost in Nagli crop for increase in yield net profit and soil health



with Farmer practice (No Use of fertilizers), Recommended Dose of Fertiliser (8 -10 t ha⁻¹ FYM + 40 : 20 : 00 kg NPK ha⁻¹) and 20 : 10 : 00 kg NPK ha⁻¹+ 1 t ha⁻¹ Vermicompost + Liquid Biofertilisers (i.e. Azotobactor & PSB) @ 1.25 lit ha⁻¹ (For enrichment of Vermicompost). Data of trials revealed that application of 50% of RDF with Use of LBF enriched vermicompost recorded yield 1445 kg/ha and B:C ratio (1.29), compared to RDF (1.21) and Farmer practice (1.28) BCR.



On farm trial was conducted by KVK-Valsad to assess the use of liquid biofertiliser enriched vermicompost in brinjal crop for increase in yield net profit and soil health with Farmer practice (i.e 172: 70: 85 kg NPK ha⁻¹), 75% Recommended dose of





fertilizer (75:28:28 kg N, P₂O₅, K₂O ha⁻¹) + 25% 0f RDF through Bio-compost (10 tones ha⁻¹) and 60% Recommended dose of fertilizer (60:30:30 kg N, P₂O₅, K₂O ha⁻¹) +12 t FYM ha⁻¹ (20% 0f RDF) +1.25 lt. ha⁻¹ LBF(20% 0f RDF). Data of trials revealed that application of 60% of RDF with Use of LBF enriched FYM increased 34.81% net profit and B:C ratio (3.62), compared to RDF (3.29) and Farmer practice (2.83) BCR.

Integrated Pest & Disease Management

Insect pests and disease are another important causes responsible for low productivity of Crops, Vegetable, Spices etc. Keeping this in view KVKs conducted On-Farms Trials on this aspect, the results of which are presented below.

Integrated Pest Management

In district Anand, pod borer attack was experienced in chickpea. The crop yield affected due to attack of pod borer in chickpea. Farmers generally apply chemical insecticide at time of severe incidence and effective management this insect is only possible by proper monitoring during flower initiation stage. Installation of Pheromone traps with Helicoverpa armigera lures @ 40 nos/per ha and spraying of Neem oil



- @ 0.05%. Same treatment was applied during rabi 2016-17 in managing pod borer in chickpea. This intervention was found most effective for management of pod borer with yield advantage of 22.50% over farmer practices.
- An OFT was conducted by KVK Banaskantha-I on management of white grub in Kharif groundnut. Treatment scheduled for groundnut were T1 Farmers practice: Lower dose of insecticide (Quinalphos 25% EC @5 ml/kg seed); T2 Recommended: Seed treatment with Quinalphos 25% EC @25ml/kg seed; T3 Intervention: Seed treatment with imidacloprid 17.8SL @4ml/kg seed. The results revealed that under T3 groundnut yield was higher (35.06 q/ha) giving maximum net returns of Rs.1,00,695/ha and B:C ratio (4.27) as compared to T2 (3.94 B:C ratio) and T1 (2.92 B:C ratio).







- KVK Bharuch conducted assessment trials on management of Pink ball Worm in B.T. Cotton. Farmer do not use pheromone trap.T1- Farmer practices T2: Recommended practices: Spraying of Quinalphos @ 20 ml, Fenvalerate 10 ml in 10 lit water. Installation of pheromone traps for pink bollworm @ 5 no. /ha T3 - Spraying of Cypermethrin 10 ml, Emamectin benzoate @ 4 gm in 10 lt. water. Timely Installation of pheromone trap for pink bollworm @ 40 per ha. The results revealed that under T3 The incidence of Pink ball worm reached (6%) than T1 (24%) and T2 (14%). Management of pink ball worm increased yield of cotton (26.50 percent).
- KVK Junagadh also assessed low fruit setting and higher infestation of inflorescence sucking pests in mango during November, December 2016 under T1-farmers practice and T2-application of two sprays of bio pesticide; Beauveria bassiana (cfu 1x107/g) @ 20g per 10 lit water at 15 days interval starting from pest infestation viz. hoppers, thrips and flower bugs in mango orchard. The results revealed that the pest population of 21 & 8 percent was observed in T1 and T2 and yield quintal per hectare found with 59.00 & 44.2 respectively with 4.19 B:C ratio of T2 as compared to 3.12 of T1.
- An assessment trial was conducted by KVK
 Junagadh to manage the white grub in
 groundnut during Kharif 2016-17. In farmers
 practices, seed treatment with
 chloropyriphos @25ml/kg seed and
 drenching of chloropyriphos @ 4lit/ha as

- initiation of pest incidence and Drenching of Beauveria bassiana @ 5 kg/ha as initiation of pest infestation. Data analysis indicated that groundnut yield under drenching treatment was higher (30.2 q/ha) as compared to Farmer practice (25.0 q./ha) and IInd treatment (28.8 q./ha). Net profit earned was higher (Rs 96444 with B:C ratio 3.67) followed by T3 (Rs 90536 with B:C ratio of 3.51) as compared to farmer practices.
- KVK Junagadh assessed the field efficacy of bio-pesticide against pest complex of Okra during Kharif 2016-17. Under farmers practice and T2-two spray of bio-pesticides Metarhizium anisopliae (cfu 1x107/g) @ 4 gm/liter water at 15 days interval starting from pest infestation. The results revealed that pest population 22 & 7 percent was observed T1 & T2 respectively. The yield was observed as 98 & 118 qtl. per hectare with net return Rs. 31255/ha & 42230/ha respectively, with 4.88 B:C ratio of T2 as compared to 3.43 of T1.
- KVK Kheda assessed the efficacy of MAT & BAT in Ivy gourd using MAT block, Poison Bait and combination of MAT & BAT. In T1 farmers practices farmer's are used MAT block 8 no. / ha. In T2 Used MAT block as per SAU recommendation 16 no. / ha.(One time installation). In T3 use MAT block as per SAU recommedation, but two time installation(3 months after 1st installation). It was observed that Marketable yield was higher in T3 (378.13 q/ha.) as compared to T1 (357.50 q/ha.) and T2 (368.16 q/ha.) respectively. The trapping of fruit fly is higher in T3 as comparted to T2. Economic



of assessment also indicate the T3 was recorded in highest net value (Rs. 417085/-, 1:3.78) as compared to T1 (Rs. 387160/-, 1:3.60). T2 (Rs. 402810/-, 1:3.70), respectively.

- Wheat is the major rabi crop of the Udaipur district, but the production gets negatively affected by termite attack. In order to assess the effect of insecticides on management of termite, this OFT was conducted. The results showed better effect of Chloropyriphos (11.0%) on termite attack as compared to Fipronil (14.0%). The increase in yield over farmer's practice was also found to be higher in Chloropyriphos (50.95 %) as compared to fipronil (28.80 %).
- KVK Valsad conducted on-farm trial to assess efficacy of different pesticides for proper management of mango hoppers with Arbitrary use of pesticides Monocrotophos @ 10 ml/ 10 lit, Cypermethrin 25 EC @ 3ml/10 lit and Imidachloprid 17.8 SL@ 3 ml/10 lit) (Farmers practices), First Spray of Synthetic Pyrethroids (Cypermethrin 25 EC @ 3ml/10 lit) at early stage of panicle formation and second spray of Imidachloprid 17.8 SL@ 3 ml/10 lit after fruit set (recommended practice) and First spray of Imidachloprid 17.8 SL@ 3 ml/10 lit at early stage of panicle formation and second spray of Thiomethoxam @ 2 g / 10 lit after fruit set. Result showed that lowest infestation of hoppers (11%) and highest yield (10950 kg/ha) was found in T3 as compared to T2 and Farmer practice i.e T1.

Integrated Disease Management

- An OFT was conducted by KVK Banaskantha-I for Potato cut pieces rotting. T1 – Farmers practice: Improper seed treatment. T2 - Recommended: Seed treatment with Mecozeb 75% WP @ 1kg + 5 talk powder/ha and Intervention: Seed treatment with Mencozeb 75% WP (a) 1kg + 5 kg/ha talk powder followed by Tricoderma viridae (2 x 108 CFU) @ 10 gm/kg seed The results revealed that under treatment T3 Potato yield was higher (236.50 q/ha) giving maximum net return of Rs.175335- /ha with B:C ratio of 2.81 as compared to T2 (Rs.145275/- net return, 2.54 B:C ratio) and T1 (Rs. 111725 net return, 2.21 B:C ratio).
- Cumin is an important spice of western Rajasthan. However, there is high incidence of blight disease resulting in yield loss and quality. Krishi Vigyan Kendra, Danta, Barmer conducted on-farm trial to assess the management measure. The assess technology was Application of Mancozeb @ 1.5g + Carbendazim @1.5g per litre of water at 35-40 DAS & 100% flowering stage (Two spray) reduced the percentage of disease incidence from 25.5 to 6.75 and yield was increased by 58.62 per cent in comparison to farmer practice.
- KVK Churu-I assessed the effect of dimethyl sulfo-oxide spray on mustard to protect from frost injury under three groups Farmer's Practice (no use of spray); Sparing of Sulphuric acid @ 0.1 % and T3 Spray of di-methyl sulfo-oxide @ 0.078%. It was observed that use of di-methyl sulfo-oxide



- spray enhanced the grain yield by 85.9% (11.34q/ha) over T1 (6.10q/ha) followed by T2 (9.86q/ha). with B:C ratio 2.18.
- On-Farm Trial was conducted by KVK Churu I on management of collar rot in groundnut. T1- No seed and soil treatment (Farmers Practice); T2- Soil treatment with Trichoderma harzanium @4 kg/ha and seed treatment with Trichoderma harzanium @10g/Kg and T3- Soil treatment with Trichoderma harzanium @5 kg/ha and seed treatment with Trichoderma harzanium@ 10g/kg. It was observed that groundnut yield under group (T3) was the 29.17% higher (39.68q/ha) than T1 group and obtained more profit with B:C ratio 3.77 followed by T-2 (38.44 g/ha) with B:C ratio 3.67 and the lowest yield under T1 (30.72 g/ha) with lowest B:C ratio 2.96, respectively.
- KVK Churu I did assessment of dose of bioagent in managing root rot in chickpea using three groups. Farmer practice (no use of soil and seed treatment) Soil treatment with Trichoderma harzanium @4 kg/ha and seed treatment with Trichoderma harzanium @10g/Kg and T3: Soil treatment with Trichoderma harzanium @ 6kg/ha and seed treatment with Trichoderma harzanium @ 10g/kg was found effective in managing disease root rot under water stress dry land situation. Only 2.0 % infected roots followed by 6.0 % and 20.0 % in T2 and T1 respectively.
- An OFT was conducted by KVK Dungarpur on Management of leaf blight disease of Colocasia. T1- Farmers practice (No use of PP measures); T2- Spray of Mancozeb @

- 0.25% and T3- Soil treatment with FYM enrich Trichoderma + seed treatment with Trichoderma @ 10g/kg + foliar spray of metalaxyl 4%+ mancozeb 68% (Ridomil MZ -72) @ 2.0g/L at the appearance of the disease observed that yield under T3 was the 137% higher (152.40 q/ha) than T1 group and reported more profit (Rs 202820/- with B:C ratio 2.84) followed by T-2 (84.20 q/ha resulting into profit of Rs 80060/- with B:C ratio 1.12 and the lowest yield under T1 (64.30 q/ha) with a net profit of Rs 44240 and the lowest B:C ratio 0.62, respectively.
- An assessment trial was conducted by KVK Junagadh to assess effect of integrated management of major diseases of groundnut during Kharif 2016-17. Treatments were Farmers practices, recommended practices (T2) as seed treatment with tebuconazole 2% DS @ 1.5g/kg and spray tebuconazole 250 EC@10ml/10lit water at 45 and 60 DAS and (T3) seed treatment with carbendazim + mancozeb @ 3 g/kg and spray carbendazim + mancozeb @ 25 gm/10 liter of water at 45 and 60 DAS. In this trial, it has been found that groundnut yield increased in T2 by 17.7% (30.6 q/ha) & T3 by 12.31% (29.2 q/ha) as compared to farmer practice. In Treatment T2 Farmers earned net profit of Rs. 98132/- with B:C ratio of 3.72.
- Trials on the management of powdery mildew in Coriander during Rabi 2016-17. Treatment were farmers practices, recommended practices (T2) as three sprays of hexaconazole 5 EC 0.005% (10 ml/10 lit water) at 15 days interval starting from initiation of disease and three sprays of



wettable sulphur 0.2% (25 gm/10 lit water) at 15 days interval starting from initiation of disease resulted the yield as 19.2 qtl/ha in T2 compared to 18.2 qtl/ha in T3 and 16.8 qtl/ha in T1. The net return was received in T2 of Rs.111600/ with B:C ratio of 5.89 as compared to T3 and T1.

- An OFT was conducted by KVK Bhuj on "Integrated Management of Wilt in Cumin". The treatments were Farmer practice- use of mancozeb and carbendazim, Recommended practice- use of wilt resistant cultivar GC-4, Seed treatment with Trichoderma @ 4 g/ kg seed and basal application of castor cake @ 0.5 t/ ha and T2 (replaced with Trichoderma @ 10g/ kg seed for seed treatment + soil application of Trichoderma @ 2.5 kg/ ha with 25 kg FYM). It is revealed that application of third treatment in cumin found in reducing the disease incidence compared to farmers' practice. Grain yield under was the more (7.6 q/ha) with a net profit of Rs 91,400/- and B:C ratio 2.69 followed by recommended practice (T2) yielded 7.8 g/ha with a net profit of Rs 82000 and B:C ratio 2.45; while under farmers' practice (T1) it was the lowest (5.8 q/ha) obtained profit of Rs 66,700/- with B:C ratio 2.30, respectively.
- KVK Rajkot-I conducted `assessment trial on use of Trichoderma for wilt disease management in cumin. No use of trichoderma or fungicide at the time of sowing. But farmers use fungicides viz., carbendazim, hexaconazole, difenconazole, tebuconazole, propiiconazole, , etc after of initiation of diseases. (Farmers practices.)

- T2- Application of Trichoderma @ 5 kg /ha with organic manure @1000 kg / ha at the time of sowing.. (Recommended practices) and application of Trichoderma @ 5 kg /ha along with organic manure @1000 kg / ha at the time of sowing and second application of Trichoderma @ 5 kg /ha along with organic manure by broadcasting method at 15 days after germination. (Intervention). It was observed that the cumin yield was highest 7.62 q/ha under refinement group earning highest net return Rs. 69856/- (B:C ratio 2.97) followed by recommended practice (T2)6.88 q/ha yield with net returns of Rs. 57860/ (B:C ratio 2.7) and the farmer practice T1 yield was 6.27 g/ha with net returns Rs 52545/ (B:C ratio 2.6). It was concluded that use of Trichoderma + organic manure twice giving good result 20.5% more yield than farmer practice due to reduction in wilt disease up to 13.7% (Farmer practice) to 20.5% (in technology).
- Ginger used to be a very popular crop of Jhadol block in Udaipur district of Rajasthan. But with continuous incidence of rhizome rot in the crop, farmers have stopped the cultivation of ginger after getting heavy losses in yield. KVK Udaipur conducted OFT to identify the suitable treatment for management of rhizome rot by comparing the package of soil application of trichoderma with FYM (3 kg per qtl FYM), seed treatment with chloropyriphos (@ 5 ml/kg seed), streptocyclin (@ 3gm/20kg seed), tebuconazole (@ 2gm/kg seed) and bavistin (@ 2.5gm/kg seed) also two spray with SAAF (@ 2gm/lit water) at 30 and 60 days of crop and if needed and also saaf at



storage 5 gm per kg seed with farmer's practice of M 45 (T1). T2 was found to be most effective as it increased the yield by 188.23 percent as compared to T1. The incidence of rhizome rot was found to be only 8 % in case of T2 as compared to 68 % in case of T1.

KVK Valsad conducted on-farm trial for the management of mosaic disease in bitter gourd with Kohinoor variety (Farmers practice), improved var. (Coimbatore long) + removal of infected plant and spraying of systemic insecticide for control of vector (Recommended practice), and Mosaic resistant variety (Vivek)+ removal of infected plant and spraying of systemic insecticide for control of vector. Result showed that lowest mosaic disease incidence (6%) and highest yield (21500 kg/ha) was recorded in T3 as compared to T2 and farmer practice.

Integrated Weed Management

• KVK Churu-I management of weed striga in Pearl millet by using three groups. Farmers practice; T2- Spray of weedicide 2,4D @ 500 g/ha post- emergence and T3: T2 + spray of urea @ 1% after 30 DAS. The higher yield (15.32q/ha) with (B:C ratio 1.89) under T3 group followed by T2 (13.81q/ha with B:C ratio 2.20) proved the effect of urea spray as it enhances the growth of Pearl millet which suppress the weed growth.

Natural Resource Management

 An OFT was conducted by KVK Banaskantha-I for wider spacing of castor at 180 cm X 90 cm (T3) instead of

- recommended practices of 150 cm X 75 cm (T2) and 90 120 cm X 60 cm (T1: farmers practices) in kharif sown castor on 5 farmers field at Nagarpura Ta. Vadgam. The intervention treatment of wider spacing (T3) recorded higher seed yield of 28.36 q/ha with net return of Rs. 99,250 /ha and B:C ratio (4.54) as compared to T2 (RRs. 85474/net return and B:C 3.90) and famers practices T1 (Rs. 71155/- net return with B:C 3.27).
- KVK Sardarshahr, Churu-I (Raj) conducted on-farm trial to overcome poor germination problem of chickpea due to moisture stress. The results indicated that productivity of chickpea was found 14.39 q/ha by sowing of chickpea seed with wide V shape furrow opener whereas 12.63 q/ha by sowing of chickpea seed with narrow V shape furrow opener in seed -cum -fertilizer drill resulting in 1.76 q additional yield with additional monetary benefit of Rs. 8800/- per ha.
- KVK Junagadh assessed the high density plantation in cotton crop during Kharif 2016-17. T1 Farmer practices (sowing of cotton with 150 cm x 60 cm spacing), Recommended practice (sowing of cotton with 120 cm x 45 cm spacing) and Sowing of cotton with high density (90 cm x 30 cm spacing). It was observed that yield under T3 trial (31.66 q/ha) was 35.88 % higher over T2 (27.06 q/ha) & T1-farmer's practice (23.30 q/ha) and net returns was also higher (Rs 106470/-/ha) as compared to T2 (Rs. 86770/-) & T1 (Rs. 70850/-/ha).
- Assessment trial was conducted by KVK, Kutch-I on "Effect of thinning practices on



fruit quality and yield of Datepalm (cv. Barahee)". T1: Farmers practice: Without thinning, T2: Recommendation: Cutting 1/3 number of chain in a bunch (Hubbouk: Pea size fruit stage), T3: Intervention: Thinning 1/3 number of fruits in chain in a bunch (Hubbouk: Pea size fruit stage) -Assessment. It was observed that Datepalm yield under intervention practices of KVK – T3 was (BCR: 2.89) significantly higher than having (BCR: 2.31) and was at par with T2 (University recommendation) having (BCR: 2.86). Fruit thinning practices in Datepalm is little laborious work but it gives good quality fruits and high yield as compared to without thinning practices.

- An OFT was conducted by KVK Bhuj on "Management of sun scald and fruit cracking in pomegranate". The treatments were Farmer practice- Soil application of boron; Recommended practice- Proper canopy management and spray of borax @ 0.2 % and T2+ Covering of plants with non-woven fabric plant cover. It is indicated that refined technique in pomegranate helped in reducing the sun scald and fruit cracking percentage as well as insect pest infestation compared to farmers' practice. Marketable fruit yield under T3 was the highest (185.13 q/ha) with a net profit of Rs 695650/- and B: C ratio 4.02 followed by recommended practice (T2) yielded 161.57 q/ha with a net profit of Rs 597850 and B:C ratio 3.85; while under farmers' practice (T1) it was the lowest (150.8q/ha) giving profit of Rs 554000/with B:C ratio 3.77, respectively.
- KVK, Valsad in GUJRAT conducted on farm trial to assess the ideal seed rate of Paddy nursery on yield of crop in rain fed condition

- of Valsad district. The result showed that the seed rate @ 30 gm/m2 in flat bed gave 3538 kg/ha yield as compared to recommended seed rate @30gm/m2 10x1 m raised bed(100 no./ha) yield 3360 kg/ha and 3150 kg/ha from > 40 gm/m2 flat bed of farmer practices.
- KVK Kheda observed that Farmers of Kheda district grow gram in Rabi season after harvesting of Paddy. Farmers grow gram on conserved moisture. Application of irrigation water at critical Stages resulted in burning in plants, due to this plant population reduced which is directly affect production of gram, therefore KVK Kheda assessed identification of irrigation stage in Chickpea. No irrigation (Farmer method); Irrigation at Branching Stage only and T2-(B) Irrigation at Flowering Stage only It was found that 18.9 % higher yield of Gram was obtained in Irrigation at Flowering Stage T-2(B) as compared to farmer's method (11.32 q/ha) in Gram crop (T-1). Net returns and B : C ratio was also maximum under T-2 (B) (Rs 60904/ and 4.30) followed by T-2(A) (Rs 50372/ and 3.79), respectively.

Home Science

• KVK Churu-I conducted a trial on anemic adolescent girls using drumstick leaf powder as a source of iron supplement. T1-Prevailing practice (no use of aonla and drum stick leaf powder) control group; T2-Iron supplement as aonla powder (10g/day) and T3- Drumstick leaf powder (10g/day). The results of the trial showed a increased (15.01 %) in Hemoglobin (Hb) level of the adolescent girls was recorded as compared



to 7.67 % in aonla consumption group. Availability of drumstick leaf powder is easy as compared to aonla fruit powder in climate stress situations for rural women. Majority of farm women have accepted the efficiency of this intervention and have assured to use this technology on regular basis to maintain Hemoglobin (HB) level mainly in growing age of female.

Livestock (Feeding Management)

• KVK Anand conducted a trial to improve the reproductive status of buffaloes by use of bypass fat. Bypass fat feeding is recommended practice for milch animals. This technology includes deworming before bypass feeding to improve the reproductive status of buffaloes as parasitic infestation is common in this area. Milk yield and conception rate are considered as an indicators of improvement in reproductive status. Milk yield was increased by 20% over farmers' practice and conception rate of buffaloes in two inseminations over the five of farmers practice.



 KVK Anand conducted on-farm trials to improve milk yield and body coat of crossbred cow by management of internal and external parasites. In this area the internal and external parasites are commonly found over the body of animals. Deworming and topical application of Deltamethrin has been practiced to observe effect on milk yield and body coat of animals. Milk yield was increased by14% to 20% over farmers practice and animal showed lustre and healthy body coat as done by visual appraisal to that of farmers practice.



Livestock Supplemental Feeding

Animal rearing is the backbone of agriculture in Barmer district. Animal is the major source of livelihood for the farmers. But due to arid conditions the animal productivity is very low as compared to other district. Cow is the major source of milk in Thar Desert after goat. The productivity of cow milk is very low. To overcome this cause KVK Barmer-I has taken up an On Farm Trial on effect of mineral mixture along with bypass protein supplement to increase milk production in desi cows. The results showed that cows under T3 group (which were provided with SARAS mineral mixture @100g/head/day with additional by-pass protein supplement @ 5.0kg/head/day for 2 months) yielded maximum milk (12.10 lit/day) with highest



B:C ratio 1.48 as compared to cows under T1 group (7.4 lit./day). Also net profit was recorded the highest (Rs 9985/cow) from the cows under T3 group followed by T2 group under which cows were given SARAS mineral mixture @50g/head/day (Rs 7270/cow) and T1 group (Rs 6720/cow) under farmers practice.

Supplemental Feeding

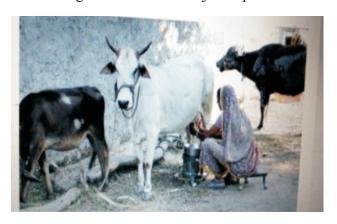
• KVK Bharuch assessed effect of Prebiotic & Probiotic for increasing milk production in Crossbred cows. Three groups were; T1-First group of five crossbred cows treated as routine farmers practices, T2- Second group of five crossbred cows to be treated with mineral mixture @50gm/day for 60 days and T3- Third group of five crossbred cows to be treated with mineral mixture @ 50gm/day for 60 days along with Prebiotic & Probiotic Combination for 60 days. The result showed that cows under T-3 group yielded 13.90lit milk/day which was observed to be 15% higher than control group of cows.



Assessment on use of milking stand and stool

An assessment trial was conducted by KVK
Dungarpur to assess the drudgery reduction
while milking the animals by farm women.
 T-1 as Local practice of milking; while

under T-2 Drudgery reducing tool was introduced i.e. revolving milking stool and stand. It was found that use of revolving milking stool and stand increased working efficiency of farm women at the time of milking the animals and it saved 15% time as compared to traditional method of milking and reduced 80% joints pain.



Livestock Health and Disease Management

• The deworming in buffalo calves for managing early calf mortality as well as average daily gain of calf body weight was assessed by KVK Junagadh during summer season. T1- farmer practice (no use of dewormer) and T2- application of albendazole 30 ml/ calf in 1st and 3rd week of age. The results showed in 90 days trial that average daily gain under T2 group was





recorded as 296.67gm as compared to 228 gm under T-1 group of calves.

Reproduction Management in buffaloes

• KVK Kheda assessed the effect of herbal seeds on buffalo reproduction. Three groups were: Farmer's practice (Herbal seeds for 5 days), Recommended - Intra Uterine Antibiotic treatment 20 days post-partum and Herbal seeds 100gm for 25 days Post-partums and mineral mixture 50g for 2 months. It was found that animals under T3 group exhibited estrus in 59 days, which resulted in higher pregnancy rate, reduced service period and also inter-calving period as compared to farmer's practice. Farmers have realized that use of herbal seeds will be followed by farmers especially in buffaloes to improve conception rate.



Livestock Feeding Management:

Technology Assessed: An assessment trial was conducted by KVK, Mundra Kutch-I on effect of feeding probiotic on production performance of lactating animals. Under Farmer's Practices of feeding green and dry fodder, cotton seed cake and wheat bran; Probiotic given @ 20gm per day up to 90 days. It was observed that milk yield of lactating cows was higher under T2



group (8.40 lit./day with B:C Ratio 1.51) as compared to T1 group (7.80 lit/day with B:C Ratio 1.45).





Feeding Management for calves growth

Technology Assessed: An assessment trial was conducted by KVK, Mundra Kutch-I on effect of feeding calf starter on body weight gain of female calf. Farmer's Practices: mother milk feeding with green and dry fodder and





Recommendation (calf starter up to 6 month of age). The results revealed that feeding of calf starter having higher amount of digestible protein and total nutrients proved effective in attaining higher body weight of calves @ 589gm/day /calf during first 180 days as compared to farmer's practices (492gm/day /calf). Further, it might be concluded that feeding of calf starter at early days reduced the puberty period of calf and farmers obtained more returns through longer lactation period of milking cow.





Livestock Balanced Feeding

KVK Rajkot-I assessed chelated and area specific mineral mixture in dairy buffalo. Three groups were - Farmer practices; Feeding with mineral mixture and feeding with chelated and area specific mineral mixture. It was found that the animals fed with chelated and area specific mineral mixture supplementation produced 10.3liter milk/day and 83days oestrus after calving as compared to 8.2 lit. milk per day and 130 days oestrus after calving in local practice.



Nutrition Management & Fertility Improvement

effect of improved concentrate mixture on milk yield of buffaloes. The farmers usually have no clear idea about the correct composition of concentrate mixture and tend to use various mixtures available in market or wheat/barley plus cotton seed cake (T1). The milk yield from this was compared with another treatment of GNC 20%, barley 35%, moong churi 27%, wheat bran 15%, salt 2% and mineral mixture 1% (T2). The trial was conducted on 10 buffaloes continuously for three months. Results showed an increase of 21.42 % in milk yield under improved



practice (5.10 liters milk/day) as compared to T1 group (4.20 liters milk/day) local practice.

DSM sanctioned a project on "Trial of Rovimix KVK premix, Rovimix beta health and Rovimix Cal-P with Biotine premix for fertility improvement of bovine" to KVK Udaipur. It was conducted in 2 villages – Junawas and Ordi, along with animals of dairy unit of KVK. The total number of animals was 108. The duration of trial was 75 days. There were 3 treatments – T1: Rovimix Beta Carotene Premix + KVK Lact. Premix + Rovimix Cal-P with Biotin,



Cow before treatment

T2: T1 + Hormonal treatment as Udaipur Protocol and T3: Rovimix KVK Lact-Premix +Hormonal treatment as per Udaipur Protocol. As per the observations, T2 showed highest percentage of conception (61.10%) as compared to T3 (41.90%) and T1 (36.60%), respectively. The glow of the animals have major differences before and after this intervention, as evident from photographs. The animals' rough hair coat changed into glowing one. About 70-80 percent animals exhibited early estrus sign and in some animals infectious conditions also improved.



Cow after treatment





FRONT LINE DEMONSTRATIONS

Front line Demonstrations (FLD) is a unique approach to provide a direct interface between researcher and farmers as the scientists are directly involved in planning execution and monitoring of the demonstrations for the technologies developed by them and get direct feedback from the farmers' fields about Production in general and technology being demonstrated in particular. Thus, FLD provides an opportunity to researchers and extension personnel for understanding the farmers' resources and requirement to fine true and modify the technologies for easy adoptability at farmers' fields. FLDs are conducted under close supervision of the scientists of the Krishi Vigyan Kendras.72 KVKs are actively involving conductance of FLDs under close supervision & guidance of ICAR-ATARI, Jodhpur in Rajasthan and Gujarat. Other than LFDs farmers field days, trainings, workshops, seminars, farmersscientists interaction etc. were conducted to facilitate interactions between researchers, extension workers and farmers/farm women. During these interactions, knowledge/experiences/constraints were exchanged for improving performance different technological packages under FLDs. Hence adoption of proven agricultural technologies on large scale could be ensured amongst farming community.

During 2016-17, a total 28988 FLDs were conducted on crops including vegetables, fruits, flower, etc. (26732), kitchen gardening (295), dairy (1896), farm implements (123), fishery (272), and others allied sectors (30). These FLDs were undertaken on 9944.92 ha area including 2416 units, respectively (Table 9.1). The FLDs undertaken by KVKs of ICAR-ATARI, Jodhpur categorized into various subheads which are given below.

Table 9.1 Achievements of FLDs Conducted during 2016-17 by KVKs.

| FLDs |] | Rajasthan | | | Gujarat | | Zone Total | | | |
|--------------------------------|---------|-----------|-------|---------|-----------|-------|-------------------|-----------|-------|--|
| | Farmers | Area (ha) | Units | Farmers | Area (ha) | Units | Farmers | Area (ha) | Units | |
| NMOOP Oilseed crops | 3212 | 1315.00 | | 2125 | 858.00 | | 5337 | 2173.00 | | |
| Oilseed crops other than NMOOP | 2079 | 775.60 | | 938 | 397.10 | | 3017 | 1172.70 | | |
| NFSM pulse crops | 4170 | 1639.60 | | 3201 | 1154.20 | | 7371 | 2793.80 | | |
| Pulse crops other than NSFM | 592 | 241.50 | | 1038 | 335.68 | | 1630 | 577.18 | | |



| FLDs | I | Rajasthan | | | Gujarat | | Zone Total | | | |
|---------------------|---------|-----------|-------|---------|-----------|-------|------------|-----------|-------|--|
| | Farmers | Area (ha) | Units | Farmers | Area (ha) | Units | Farmers | Area (ha) | Units | |
| Cereal crops | 1947 | 721.10 | | 2047 | 654.20 | | 3994 | 1375.30 | | |
| Commercial crops | 526 | 209.50 | | 430 | 165.00 | | 956 | 374.50 | | |
| Fodder crops | 375 | 88.80 | | 367 | 131.30 | | 742 | 220.10 | | |
| Horticultural crops | | | | | | | | | | |
| Fruits | 16 | 3.0 | | 308 | 120.00 | | 324 | 123.00 | | |
| Vegetables | 346 | 49.95 | | 795 | 224.36 | | 1141 | 274.31 | | |
| Flowers | | | | 85 | 17.00 | | 85 | 17.00 | | |
| Medicinal Crops | | | | | | | 0 | 0.00 | | |
| Millet Crops | 372 | 240.50 | | 156 | 36.00 | | 528 | 276.50 | | |
| Spice Crops | 686 | 243.00 | | 561 | 207.20 | | 1247 | 450.20 | | |
| Total (a) | 14321 | 5527.55 | | 12051 | 4300.04 | | 26372 | 9827.59 | | |
| Fishery | 10 | 10.00 | | 262 | 27.33 | | 272 | 37.33 | | |
| Dairy | 935 | | 956 | 961 | | 1135 | 1896 | 0.00 | 2091 | |
| Farm implements | 53 | 75.00 | | 70 | 5.00 | | 123 | 80.00 | | |
| Kitchen gardening | | | | 295 | | 295 | 295 | 0.00 | 295 | |
| Others | 20 | | 20 | 10 | | 10 | 30 | 0.00 | 30 | |
| Total (b) | 1018 | 85.00 | 976 | 1598 | 32.33 | 1440 | 2616 | 117.33 | 2416 | |
| Grand Total (a & b) | 15339 | 5612.55 | 976 | 13649 | 4332.37 | 1440 | 28988 | 9944.92 | 2416 | |

Cluster Front Line Demonstrations on Pulses Production Technology under National Food Security Mission

ICAR-ATARI, Jodhpur is implementing "Cluster Frontline Demonstrations on Pulses" under National Food Security Mission (NFSM) project through the KVKs of Rajasthan and Gujarat States. The project envisages to demonstrate production potential of new technologies and varieties of pulse crops at farmers' fields through KVKs to showcase the potentiality of usable technological packages to address the issues related to production of pulses in the country. This approach is appropriate in strengthening of forward and backward linkages in the larger interest of the farming community.

Mission objectives

- 1. Increasing production of pulses through area expansion and productivity enhancement in a sustainable manner in the identified districts of the country; ensure food and fodder security-area expansion and productivity enhancement of food crops including dual purpose coarse cereals.
- 2. Restoring soil fertility and productivity at the individual farm level
- 3. Enhancing farm level economy (i.e. farm profits) to restore confidence amongst the farmers
- 4. Increasing the Seed Replacement Rate (SRR) under pulses crop, and



5. To increase self-sufficiency in nutrient by increasing pulses production with quality seed production of pulses.

Achievements

During 2016-17, a total of 7371 Cluster Frontline Demonstrations (CFLDs) were laid out in the 2793.80 ha area against the sanctioned 7400 CFLDs in 2940.00 ha area. In Rajasthan,

31 KVKs were involved in CFLDs during kharif, rabi and summer season while 26 KVKs of Gujarat demonstrated the production potentiality of pulses in all three seasons. Out of 4225 planned demonstrations, 4170 CFLDs were conducted in 1639.60 ha areas in Rajasthan while 3201 demonstrations were laid out in 1154.20 ha by KVKs of Gujarat.

Season wise achievements of CFLDs on pulses during the year 2016-17

| State | Season | Sanc | tioned | Implemented | | | |
|---------------------|------------|------------|-----------|-------------|-----------|--|--|
| | | Demo (No.) | Area (ha) | Demo (No.) | Area (ha) | | |
| Rajasthan (31 KVKs) | Kharif | 1975 | 800.00 | 2024 | 769.20 | | |
| | Rabi | 2050 | 820.00 | 1971 | 800.40 | | |
| | Summer | 175 | 70.00 | 175 | 70.00 | | |
| | Total | 4225 | 1690.00 | 4170 | 1639.60 | | |
| Gujarat (26 KVKs) | Kharif | 825 | 330.00 | 876 | 310.00 | | |
| | Rabi | 1075 | 430.00 | 1115 | 370.60 | | |
| | Summer | 1225 | 490.00 | 1210 | 473.60 | | |
| | Total | 3175 | 1250.00 | 3201 | 1154.20 | | |
| | Zone Total | 7400 | 2940.00 | 7371 | 2793.80 | | |

Crop-wise achievements of CFLDs on pulses during Kharif 2016-17

| State | Crops | Sancti | oned | Implemented | | | |
|---------------------|------------|------------|-----------|-------------|-----------|--|--|
| | | Demo (No.) | Area (ha) | Demo (No.) | Area (ha) | | |
| Rajasthan (28 KVKs) | Moth bean | 275 | 110.00 | 283 | 112.00 | | |
| | Green gram | 1050 | 420.00 | 1038 | 417.20 | | |
| | Black gram | 650 | 260.00 | 703 | 240.00 | | |
| | Total | 1975 | 790.00 | 2024 | 769.20 | | |
| Gujarat (14 KVKs) | Green gram | 200 | 80.00 | 180 | 60.00 | | |
| | Black gram | 300 | 120.00 | 356 | 120.00 | | |
| | Pigeon pea | 375 | 150.00 | 340 | 130.00 | | |
| | Total | 875 | 350.00 | 876 | 310.00 | | |
| | Zone Total | 2850 | 1140.00 | 2900 | 1079.20 | | |



During Kharif 2016-17, 2900 CFLDs were organised on 1079.20 ha area on moth bean, green gram, black gram, and pigeon pea. Of the total CFLDs, 2024 were organised in Rajasthan state in 769.20 ha area while 876 CFLDs were conducted in 310.00 ha area.

Performance of Moth bean CFLDs during Kharif 2016-17 in Rajasthan

During Kharif 2016-17, 283 CFLDs on RMO-257, CAM-2, RMO-257 & CAM-2 varieties of Moth bean along with packages were demonstrated in 112.00 ha area in Rajasthan by KVK Bikaner-I, Churu-I, Nagaur & Pali The performance of Moth bean was

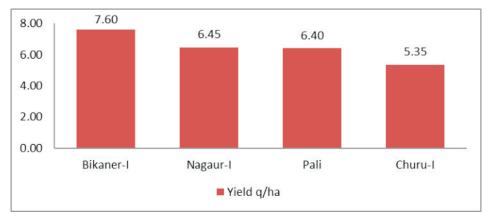
highest in Bikaner district where the productivity under CFLDs was 7.60q/ha.

Performance of Green Gram CFLDs during Kharif 2016-17 in Rajasthan:

During Kharif 2016-17, 1038 CFLDs on Green gram were laid out in 417.20 ha area in Rajasthan by KVK Barmer-I, Hanumangarh-I, Sriganaganagar, Bikaner-I, Jaisalmer-I, Churu-I, Jhunjhunu, Sikar, Sirohi, Pali, Ajmer, Jaipur-I, Tonk, Bharatpur, Karuli, Bhilwara, Bundi, Baran, & S. Madhopur. The performance of Green gram was reported highest by KVK, Sikar (12.54q/ha) followed by Tonk (12.35q/ha) district.

| Agro- climatic Zone/ Climate | KVKs | | | No. of Demo | Yield (q/ha) | | % increase | Net Return (Rs./ha) | | BCR | |
|---|------------------------|--------------|----|----------------|--------------|------|------------|------------------------|----------|-------|------|
| | | (ф/па) | | | Check | Demo | | Check | Demo | Check | Demo |
| I c- Hyper arid and partially irrigated western plain (Arid) | Bikaner- I Churu- I | 2.83 2.91 | 60 | 150 | 4.99 | 6.48 | 32.63 | 11759.00 | 17118.00 | 2.03 | 2.47 |
| II a – Transitional plain of inland drainage | Nagaur | 3.12 | 22 | 73 | 5.28 | 6.45 | 22.15 | 10650.00 | 16700.00 | 1.80 | 2.45 |
| II b- Transitional plain of Luni basin (Semi-arid) | Pali | 2.92 | 30 | 60 | 5.10 | 6.40 | 25.49 | 11000.00 | 15500.00 | 1.90 | 2.60 |

II a RMO-257, IIb CZM-2, Ic RMO-257 & CZM-2 State Average Yield: 3.84 q/ha. (2015-16).



Performance of Moth bean in Rajasthan





| Agro-climatic Zone/ Climate | KVKs | Dist. Avg. (q/ha) | Area (ha) | No. of Demo | Yield (q/ha) | | % increase | Net Return (Rs./ha) | | BCR | |
|---|--------------------------------------|-------------------------|-----------|-------------------|--------------|-------|------------|------------------------|----------|-------|------|
| | | (q/nu) | | | Check | Demo | | Check | Demo | Check | Demo |
| I a-Arid western plains zone (Arid) | Barmer-I | 0.78 | 20.00 | 50 | 2.36 | 3.45 | 46.18 | 1012.00 | 4990.00 | 1.09 | 1.38 |
| I b-Irrigated north western plain zone | Hanumangarh-I Sriganganagar | 4.15 5.31 | 50.00 | 125 | 7.55 | 9.55 | 27.60 | 25788.00 | 34191.00 | 2.80 | 3.05 |
| I c- Hyper arid & partially Irrigated western plain (Arid) | Bikaner-I Jaisalmer-I Churu- I | 5.09 5.02 2.20 | 60.00 | 150 | 6.08 | 8.27 | 39.59 | 20320.00 | 29467.00 | 2.32 | 2.81 |
| II a- Transitional plain of inland drainage (Semi arid) | Jhunjhunu Sikar | 4.46 3.10 | 60.00 | 150 | 8.55 | 10.34 | 20.80 | 24951.00 | 31581.00 | 2.59 | 2.81 |
| II b - Transitional plain of Luni basin (Semi arid) | Sirohi Pali | 4.88 3.79 | 40.00 | 130 | 6.13 | 10.94 | 87.37 | 18300.00 | 28133.00 | 1.70 | 2.90 |
| III a - Semi arid eastern plain (Semi arid) | Ajmer Jaipur-I Tonk | 5.17 4.74 4.75 | 80.00 | 175 | 7.45 | 9.61 | 28.95 | 19134.00 | 27445.00 | 1.89 | 2.20 |



| Agro-climatic Zone/ Climate | KVKs | Dist. Avg. (q/ha) | Area (ha) | No. of | of | | % increase | Net Return (Rs./ha) | | BCR | |
|--|-------------------------------|-------------------------|-----------|--------|-------|------|------------|------------------------|----------|-------|------|
| | | (q/na) | | Demo | Check | Demo | | Check | Demo | Check | Demo |
| III b - Flood prone eastern plain zone (Semi arid) | Bharatpur Karauli | 4.44 5.71 | 40.00 | 100 | 6.50 | 8.55 | 31.50 | 18150.00 | 26850.00 | 2.35 | 2.89 |
| IV a - Sub humid southern plain & Aravalli hill zone | Bhilwara | 1.23 | 50.00 | 20 | 4.24 | 5.72 | 34.90 | 13840.00 | 20820.00 | 1.20 | 1.50 |
| V - Humid south eastern plain | Bundi Baran S. Madhopur | 4.38 4.38 4.38 | 47.20 | 108 | 6.89 | 9.07 | 31.57 | 18025.00 | 29458.00 | 2.53 | 3.04 |

 $II\ b\ GM-4, IPM-02-03, II\ a\ RMG-492, IPM-02-03\ \&\ III\ b\ SML-668, IPM-02-03, IV\ a\ -\ IPM-02-03, V\ -\ SML-668, IPM-02-03, RMG-492\ State\ Average\ Yield: 4.38\ q/\ ha.$



Performance of Green gram CFLDs during Kharif 2016-17 in Gujarat

Technological packages were decided based on gap analysis between existing and recommended practices. Quality seeds of preferred varieties of green gram along with recommended packages were demonstrated at farmer's fields under different farms situations. Highest yield was reported by KVK Kutch-I (9.2 q/ha) followed by Amereli (8.55 q/ha) and Patan (7.75 q/ha). Farmers showed positive attitude and they have 30-40% green gram produce as a seed for coming Kharif season (2017) multiplication.



Performance of Black gram CFLDs Organized during Kharif 2016-17 in Rajasthan

Black gram is also important Kharif pulse crop. Cluster Front Line Demonstrations were carried out at selected farmer's fields by respective KVK's during Kharif 2016. In almost districts yield level was reported double in comparison to State average. Farmers have received maximum net return of Rs 56300/ha with B.C. ratio 4:11 in Humid south Eastern Plain region of State. There is tremendous Scope of maximization of productivity of black gram in different parts of Rajasthan during rainy season.



| Agro-climatic | KVKs | Dist. | Area | No. | ` 1 / | | Net Return | | BCR | | |
|-----------------|----------|-------------|-------|------------|---------------------|------|------------|----------|----------|-------|------|
| Zone/ Climate | | Avg. (q/ha) | (ha) | of Demo | Check Demo increase | | (Rs. | /ha) | | | |
| | | | | | | | | Check | Demo | Check | Demo |
| North Saurastra | Amreli | 4.57 | 20.00 | 50 | 7.36 | 8.55 | 16.16 | 17884.00 | 26400.00 | 2.23 | 2.82 |
| North Gujarat | Patan | 4.49 | 20.00 | 50 | 6.12 | 7.75 | 26.63 | 16300.00 | 21500.00 | 2.58 | 2.98 |
| North west | Kutch- I | 3.35 | 20.00 | 50 | 7.6 | 9.2 | 21.05 | 27930.00 | 31750.00 | 2.01 | 2.22 |

North Saurastra – GM-4, North Gujarat – GM-4, North west – GM-5 State Average Yield: 4.48 q/ ha.





| Agro-climatic Zone/ Climate | KVKs | Dist. Avg. | Area (ha) | No. of Demo | Yield (q/ha) | | % increase | | eturn /ha) | BCR | |
|--|---|------------------------------|-----------|----------------|--------------|-------|---------------|----------|---------------|-------|------|
| | | (q/ha) | | | Check | Demo | | Check | Demo | Check | Demo |
| III a – Semi arid eastern plain | Tonk | 5.49 | 20.00 | 50 | 7.90 | 10.95 | 38.60 | 34000.00 | 52300.00 | 2.61 | 3.27 |
| IV a- Sub humid southern plain& Aravalli hill zone | Bhilwara Rajsamand Chittorgarh Partapgarh Udaipur | 1.87 3.84 2.29 6.70 | 110.00 | 343 | 5.72 | 7.38 | 29.32 | 21708.00 | 31334.00 | 2.09 | 2.71 |
| IV b – Humid southern plain | Banswara Dungarpur | 3.23 5.29 | 40.00 | 150 | 4.5 | 7.01 | 63.94 | 15800.00 | 25171.00 | 1.70 | 2.28 |
| V - Humid south eastern plain | Kota Jhalawar Baran | 4.26 3.98 3.21 | 70.00 | 160 | 8.12 | 11.16 | 37.47 | 38000.00 | 56300.00 | 2.97 | 4.11 |

 $III\ a-PU-31, IV\ a-Azad-2, Azad-3, PU-31, IV\ b-Azad-3, PU-31, V-PU-31\ State\ Average\ Yield: 3.84\ q/\ ha$





Performance of Black gram CFLDs Organized during Kharif 2016-17 in Gujarat

Most preferred varieties with relevant and suitable technological packages were demonstrated at farmer's fields during Kharif 2016 in selected districts of Gujarat. Yield variation was noticed in almost all Agro-Climatic



Zone. Highest yield (7.59 q/ha) was reported by KVK Mehsana but maximum percentage increase was obtained by farmers of Tapi district of South Gujarat. Maximum net profit Rs 30,500/ha has been obtained in Mehsana. Farmers have kept seeds of preferred variety(s) horizontal expansion during coming Kharif 2017.

| Agro-climatic Zone/ Climate | KVKs | Dist. Avg. (q/ha) | Area (ha) | e | of | | % increase | Net Return (Rs./ha) | | BCR | |
|---------------------------------|---------------------------|-------------------------|-----------|------|-------|------|------------|------------------------|----------|-------|------|
| | | (q/III) | | Demo | Check | Demo | | Check | Demo | Check | Demo |
| South Gujarat heavy rainfall | Tapi | 7.69 | 20.00 | 50 | 3.8 | 5.5 | 44.73 | 16800.00 | 21870.00 | 2.32 | 3.05 |
| South Gujarat medium rainfall | Surat Kheda Bharuch | 3.75 5.00 10.48 | 60.00 | 206 | 5.52 | 7.12 | 25.39 | 21500.00 | 28400.00 | 2.81 | 3.52 |
| Middle Gujarat | Vadodara | 8.41 | 20.00 | 50 | 5.20 | 7.12 | 36.92 | 20900.00 | 28130.00 | 2.70 | 3.42 |
| North Gujarat | Mehsana | 9.04 | 20.00 | 50 | 6.22 | 7.59 | 22.02 | 23890.00 | 30500.00 | 2.87 | 3.71 |

South Gujarat heavy rainfall-GU-1, South Gujarat medium rainfall-GU-1, PU-31, Middle Gujarat-MASH (KUG) -479, North Gujarat-GU-1 State Average Yield: 6.34q/ha







Performance of Pigeon pea CFLDs Organized during Kharif 2016-17 in Gujarat

Pigeon pea is one of the important pulse crop of kharif season. Mostly medium duration variety (s) which mature 160-170 days are adopted by farmers in Gujarat State .Rainy season 2016-17 was quite favourably for pigeonpea. There was very less infestation of

diseases and pod-borer in pigeonpea. Farmers obtained 20.82q/ha yield in North Sourastra Zone of Gujarat. More over all districts reported better yield advantage in comparison to state and particular district. AGT-2 and Vaishali varieties have been assessed to be promising in the existing farming environment of different agro-ecological zones of Gujarat.

| Agro-climatic Zone/ Climate | KVKs | Dist. Avg. (q/ha) | Area (ha) | No. of Demo | Yield | Yield (q/ha) | | Net Return (Rs./ha) | | BCR | |
|-------------------------------|-----------------------|-------------------------|--------------|-------------------|-------|--------------|-------|------------------------|----------|-------|------|
| | | | | | Check | Demo | | Check | Demo | Check | Demo |
| Middle Gujarat Zone | Vadodra Panchmahal | 12.61 19.14 | 40.00 | 100 | 10.80 | 14.55 | 35.31 | 33950.00 | 52790.00 | 2.74 | 3.59 |
| North Gujarat Zone | Sabarkantha | 11.56 | 20.00 | 50 | 10 | 12.7 | 27.00 | 21750.00 | 30500.00 | 2.05 | 2.36 |
| South Gujarat medium rainfall | Bharuch Narmada | 9.06 9.65 | 40.00 | 115 | 12.5 | 15.23 | 21.84 | 30150.00 | 56300.00 | 2.28 | 3.67 |
| North saurastra zone | Amreli Jamnagar | 9.84 9.84 | 30.00 | 75 | 17.72 | 20.82 | 17.54 | 63883.00 | 80357.00 | 3.58 | 4.29 |

Middle Gujarat Zone-Vaishali, AGT-2, North Gujarat Zone-AGT-2, South Gujarat medium rainfall-Vaishali, North saurastra zone-Vaishali State Average Yield: 11.85 q/ ha





Crop-wise achievements of CFLDs on Pulses during Rabi 2016-17

In Rabi 2016, 31 KVKs from Rajasthan and 17 KVKs from Gujarat were actively involved in organization of CFLDs on chickpea, lentil and green gram (Table-3.4). A total of

3086 CFLDs were conducted in 1171 ha area in Rajasthan and Gujarat state. Under chick pea and lentil, 1971 CFLDs were laid out in 800.40 ha area by KVKs of Rajasthan. KVKs of Gujarat state conducted CFLDs in 370.60 ha area in chickpea and green gram.

| State | Crop | Sanct | ioned | Implemented | | |
|---------------------|-------------------|-------|-----------|-------------|-----------|--|
| | | Demo | Area (ha) | Demo | Area (ha) | |
| Rajasthan (31 KVKs) | Chickpea | 1900 | 760.00 | 1921 | 780.40 | |
| | Lentil | 150 | 60.00 | 50 | 20.00 | |
| | Total | 2050 | 820.00 | 1971 | 800.40 | |
| Gujarat (17 KVKs) | Chickpea | 975 | 390.00 | 1025 | 342.60 | |
| | Green gram | 100 | 40.00 | 90 | 28.00 | |
| | Total | 1075 | 430.00 | 1115 | 370.60 | |
| | Zone Total | 3125 | 1250.00 | 3086 | 1171.00 | |

Performance of Chickpea CFLDs during Rabi 2016-17 in Rajasthan

Chickpea is most preferred pulse crop of rabi season of Rajasthan. Farmers always eager to cultivate chickpea in almost districts of Rajasthan. But terminal droughts affected area/coverage of chickpea, technological packages were finalized in active participation of farmers to conduct Cluster Front Line Demonstrations on chickpea during rabi 2016-17. Farmers contributed 25 to 30 per cent cost of seeds of different varieties of chickpea. Maximum average yield (19 q/ha) reported in Transitional Plain of inland drainage zone followed by 16.08 q/ha irrigated north western

plain zone. Farmers have opined that they will continue application of accepted technological packages in coming season. It is clear from below table that yield of chickpea could be increased by simple use of quality seeds of farmers preferred variety(s) in different agroecological zones of Rajasthan. Farmers were perceived that GNG-1581 variety is compitable with existing farming situations. Farmers obtained net profit of Rs. 62,400/- ha with B.C. ration 3.41 in Flood prone eastern plain zone (Semi-arid). Farmers also briefed that productivity of chickpea is quite satisfactory during rabi 2016-17 as there was less attack of pod-borer in chickpea.



| Agro- climatic Zone/ Climate | KVKs | Dist. Avg. (q/ha) | Area | No. of Demo | Yield | (q/ha) | % increase | | eturn /ha) | ВС | CR |
|--|--|---|--------|-------------------|-------|--------|------------|----------|---------------|-------|------|
| | | (ф/па) | (ha) | Demo | Check | Demo | | Check | Demo | Check | Demo |
| I a -Arid western plains zone (Arid) | Barmer- I | 08.92 | 10.40 | 26 | 08.21 | 10.29 | 25.33 | 27577.00 | 37998.00 | 2.68 | 3.80 |
| I b – Irrigated north western plain zone | Hanumangarh-I Sriganganagar | 10.33 05.51 | 70.00 | 150 | 10.36 | 16.08 | 54.85 | 31866.00 | 65700.00 | 3.11 | 4.74 |
| I c- Hyper arid and partially irrigated western plain (Arid) | Bikaner-I Jaisalmer-I Churu-I | 12.50 10.50 03.72 | 80.00 | 195 | 11.79 | 15.94 | 35.43 | 40000.00 | 57245.00 | 2.97 | 3.46 |
| II a - Transitional plain of inland drainage (Semi arid) | Jhunjhunu Sikar Nagaur- I Jaipur- I Tonk | 04.83 12.11 10.42 07.76 11.55 | 110.00 | 225 | 15.51 | 19.03 | 22.68 | 56615.00 | 74345.00 | 3.22 | 3.76 |
| Middle Gujarat Zone | Vadodra Panchmahal | 12.61 19.14 | 40.00 | 100 | 10.80 | 14.55 | 35.31 | 33950.00 | 52790.00 | 2.74 | 3.59 |
| North Gujarat Zone | Sabarkantha | 11.56 | 20.00 | 50 | 10 | 12.7 | 27.00 | 21750.00 | 30500.00 | 2.05 | 2.36 |
| South Gujarat medium rainfall | Bharuch Narmada | 9.06 9.65 | 40.00 | 115 | 12.5 | 15.23 | 21.84 | 30150.00 | 56300.00 | 2.28 | 3.67 |
| North saurastra zone | Amreli Jamnagar | 9.84 9.84 | 30.00 | 75 | 17.72 | 20.82 | 17.54 | 63883.00 | 80357.00 | 3.58 | 4.29 |
| I a -Arid western plains zone (Arid) | Barmer- I | 08.92 | 10.40 | 26 | 08.21 | 10.29 | 25.33 | 27577.00 | 37998.00 | 2.68 | 3.80 |
| I b – Irrigated north western plain zone | Hanumangarh-I Sriganganagar | 10.33 05.51 | 70.00 | 150 | 10.36 | 16.08 | 54.85 | 31866.00 | 65700.00 | 3.11 | 4.74 |
| I c- Hyper arid and partially irrigated western plain (Arid) | Bikaner-I Jaisalmer-I Churu-I | 12.50 10.50 03.72 | 80.00 | 195 | 11.79 | 15.94 | 35.43 | 40000.00 | 57245.00 | 2.97 | 3.46 |



| Agro- climatic Zone/ Climate | KVKs | Dist. Avg. (q/ha) | Area | No. of Demo | Yield (q/ha) | | % increase | Net Return (Rs./ha) | | BCR | |
|--|--|---|--------|-------------------|--------------|-------|------------|------------------------|----------|-------|------|
| | | (q/11a) | (ha) | Demo | Check | Demo | | Check | Demo | Check | Demo |
| II a - Transitional plain of inland drainage (Semi arid) | Jhunjhunu Sikar Nagaur- I Jaipur- I Tonk | 04.83 12.11 10.42 07.76 11.55 | 110.00 | 225 | 15.51 | 19.03 | 22.68 | 56615.00 | 74345.00 | 3.22 | 3.76 |
| II b - Transitional plain of Luni basin (Semi arid) | Sirohi Karauli Pali | 06.82 17.00 13.50 | 60.00 | 150 | 13.93 | 17.83 | 27.82 | 42417.00 | 59767.00 | 3.25 | 3.73 |
| III a - Semi arid eastern plain (Semi arid) | Dausa Ajmer | 11.72 04.65 | 90.00 | 40 | 14.08 | 17.98 | 29.83 | 41500.00 | 58600.00 | 2.57 | 3.22 |
| III b - Flood prone eastern plain zone (Semi arid) | Alwar-I Dholpur Bharatpur | 10.48 14.28 12.42 | 60.00 | 154 | 14.66 | 18.23 | 24.22 | 42801.00 | 62400.00 | 2.81 | 3.41 |
| IV a - Sub humid southern plain & Aravalli hill zone (Sub- humid) | Rajsamand Chittorgarh Pratapgarh Udaipur | 10.00 11.14 08.24 09.96 | 130.00 | 317 | 13.92 | 116 | 30.52 | 47240.00 | 64770.00 | 3.04 | 3.44 |
| IV b- Humid southern plain (Humid) | Banswara Bhilwara Dungarpur | 11.40 07.26 08.98 | 249.00 | 80 | 10.74 | 17.39 | 67.06 | 28145.00 | 55388.00 | 2.19 | 2.90 |
| V - Humid south eastern plain (Humid) | Kota Jhalawar S.Madhopur Bundi | 13.24 10.09 11.00 11.30 | 335.00 | 140 | 15.70 | 22.10 | 22.12 | 74039.00 | 92915.00 | 4.17 | 4.71 |







Performance of Chickpea CFLDs during Rabi 2016-17 in Gujarat

Chickpea is also cultivated in Gujarat during rabi season. GJG-3, GC-3 are preferred varieties of farmers of Middle, South Gujarat medium and highest rainfall zones. Technological packages were advocated and demonstrated as per perception and demand of farmers of selected districts. Maximum 16.88 q/ha yield was found in middle Gujarat along with net profit 60244/ha. Farmers have readily accepted potentiality of technological packages and they will follow in next season.

| Agro- climatic Zone/ | KVKs | Dist. Area Avg. (ha) | | No. of Demo. | Yield (q/ha) | | % increase | Net Return (Rs./ha) | | BCR | |
|---|--|----------------------------------|--------|--------------|--------------|-------|------------|------------------------|----------|-------|------|
| Climate | | (q/ha) | | | Check | Demo | | Check | Demo | Check | Demo |
| South Gujarat Heavy rainfall (Sub humid semi arid) | Valsad Kheda Navsari | 11.80 11.30 07.80 | 82.00 | 320 | 9.99 | 12.41 | 25.96 | 37600.00 | 43760.00 | 3.12 | 3.52 |
| South Gujarat medium rainfall (Sub humid semi arid) | Surat Bharuch Narmada | 11.40 | 60.00 | 206 | 13.77 | 17.17 | 24.86 | 45200.00 | 62480.00 | 3.33 | 3.98 |
| North Gujarat (Arid, semi arid) | Patan | 05.15 | 20.00 | 50 | 11.20 | 14.40 | 28.57 | 36700.00 | 51400.00 | 2.66 | 3.12 |
| Middle Gujarat | Panchmahal Dahod | 06.50 07.67 | 35.00 | 85 | 10.58 | 16.88 | 61.07 | 40800.00 | 60244.00 | 2.97 | 3.82 |
| North Saurastra (Semi-arid) | Rajkot-I Jamnagar Amreli Surendranagar | 11.00 08.80 08.80 07.39 | 100.00 | 250 | 15.59 | 18.57 | 20.23 | 59664.00 | 74990.00 | 3.65 | 4.25 |
| South Saurasthara (Dry, Sub- humid) | Porbandar | 12.41 | 8.00 | 20 | 11.05 | 20.84 | 88.60 | 32090.00 | 79000.00 | 2.39 | 4.13 |
| Bhal and costal (Semi-arid) | Bhavnagar Ahmedabad | 11.48 07.09 | 37.60 | 94 | 11.39 | 13.39 | 17.87 | 33363.00 | 43345.00 | 2.50 | 2.84 |

South Gujarat Heavy rainfall - GJG-3 (GJG 0207), South Gujarat medium rainfall - GJG-3 & North Gujarat - GC-3, Middle Gujarat - GG-2 & GJG-3 (GJG 0207) North Saurastra- GJG-3 & GG-5, South Saurasthara- GJG-3 & Bhal and costal- GG-2 & GJG-3 State Average Yield: 12.51q/ ha.





Performance of Lentil CFLDs during Rabi 2016-17 in Rajasthan

Lentil demonstrations were laid out by KVK Bharatpur during 2016-17 in 20.00 ha at 50 farmers' field. JL-3 variety along with technological packages was demonstrated at farmers' fields. Demonstration yield was 12.72 q/ha and there was 22.78 percent increase over local practice. Farmers obtained Rs. 45400/ha net profit under demonstrated technologies of lentil.



Achievements of CFLDs on pulses during summer 2017

In summer 2017, 175 demonstrations on green gram were laid out in 70.00 ha by 3 KVKs in Rajasthan while 19 KVKs of Gujarat state organized 1210 CFLDs in 473.60 ha. Overall in summer, 1385 demonstrations have been covered in 543.60 ha area.

| Agro- climatic Zone/ | KVKs | Dist. Avg. (q/ha) | Area (ha) | No. of Demo. | Yield (q/ha) | | Yield (q/ha) | | % increase | Net R (Rs. | eturn /ha) | ВС | CR |
|---|-----------|-------------------|-----------|--------------|--------------|-------|--------------|----------|------------|---------------|---------------|----|----|
| Climate | | (ц/па) | | | Check | Demo | | Check | Demo | Check | Demo | | |
| III b - Flood prone eastern plain zone (Semi arid) | Bharatpur | 10.54 | 20.00 | 50 | 10.36 | 12.72 | 22.78 | 36341.00 | 45400.00 | 2.15 | 3.45 | | |

III b- JL-3 State Average Yield: 8.53 q/ ha

| SI. | State Crop | | Sancti | oned | Implemented | | |
|-----|----------------|------------|------------|-----------|-------------|-----------|--|
| No. | | | Demo (No.) | Area (ha) | Demo (No.) | Area (ha) | |
| 1. | Rajasthan (03) | Green gram | 175 | 70.00 | 175 | 70.00 | |
| 2. | Gujarat (19) | Green gram | 1225 | 490.00 | 1210 | 473.60 | |
| | | Zone Total | 1400 | 560.00 | 1385 | 543.60 | |





Cluster Frontline Demonstrations (CFLDs) on oilseeds under NMOOP

India is one of the largest vegetable oil economies in the world. However, domestic consumption of edible oils in India has increased substantially over the years owing to rising income levels, increase in population and improvement of living standards. The demand of edible oils in India is 23.49 million tonnes against the domestic availability of 8.64 million tonnes during 2015-16. Oilseeds production assumes great importance in India because of the gap in demand and supply which force our country to import vegetable oil.

Keeping this in view, National Mission on Oilseeds and Oil Palm was launched in April, 2014 by Government of India with following objectives.

Objectives

- 1. To increase production and productivity of oilseeds crops under NMOOP
- 2. To pilot innovations and improved efficiency within the overall objective of the Scheme and its expected outcomes
- 3. To undertake mitigation/restoration activities in case of natural calamities in the oilseeds sector.

During 2016-17, a total of 2263 Cluster Frontline Demonstrations (CFLDs) on oilseeds were laid out in the 911.4 ha area against the sanctioned 2292 CFLDs in 916.6 ha area. Out of 2263 planned demonstrations, 1201CFLDs were conducted in 483.40 ha areas in Rajasthan while 1062 demonstrations were laid out in 428.00 ha by KVKs functioning in Gujarat.



Details of FLDs on Oilseeds during Kharif 2016-17

| SI. | State | Crop | Sancti | oned | Implemented | | |
|-----|-----------|-----------|--------|-----------|-------------|-----------|--|
| No. | | | Demo | Area (ha) | Demo | Area (ha) | |
| 1. | Rajasthan | Groundnut | 234 | 93.60 | 234 | 93.60 | |
| | | Soybean | 408 | 163.00 | 430 | 163.00 | |
| | | Sesamum | 550 | 220.00 | 537 | 226.80 | |
| | | Sub-Total | 1192 | 476.60 | 1201 | 483.40 | |
| 2. | Gujarat | Groundnut | 600 | 240.00 | 582 | 232.00 | |
| | | Soybean | 250 | 100.00 | 274 | 100.00 | |
| | | Sesamum | 250 | 100.00 | 206 | 96.00 | |
| | | Sub-Total | 1100 | 440.00 | 1062 | 428.00 | |
| | | Total | 2292 | 916.60 | 2263 | 911.40 | |

Performance of sesame demonstration conducted during Kharif 2016-17 in Rajasthan

| Agro | Agro KVKs Dis | | Area | No. | Yield (q/ha) % | | | Net Retur | n (Rs./ha) | BCR | |
|--|---|------------------------------|---------|------------|----------------|------|----------|-----------|------------|-------|------|
| Climatic Zone/Climate | | Avg. (q/ha) | (in ha) | of Demo | Check | Demo | increase | Check | Demo | Check | Demo |
| I a- Arid western plains zone (Arid) | Jodhpur-I | 4.11 | 10.00 | 25 | 3.08 | 8.28 | 33.51 | 13300.00 | 33380.00 | 2.61 | 2.94 |
| I c- Hyper arid and partially irrigated western plain zone (Arid) | Churu-I | 4.37 | 20.00 | 50 | 6.19 | 9.13 | 47.50 | 25196.00 | 41055.00 | 2.89 | 3.76 |
| II b- Transitional plain of Luni basin zone (Semi Arid) | Jalore Pali Sirohi | 4.44 3.40 2.60 | 60.00 | 130 | 4 | 6.03 | 60.58 | 18950.00 | 27178.00 | 1.98 | 3.03 |
| III a- Semi arid eastern plain zone (Semi arid) | Jaipur-I Tonk | 2.63 1.92 | 46.80 | 117 | 5.11 | 7.28 | 42.79 | 18653.00 | 31290.00 | 1.91 | 2.39 |
| III b - Flood prone eastern plain zone (Semi- arid) | Bharatpur Karauli Dholpur S.Madhopur | 3.40 5.27 5.71 4.97 | 80.00 | 190 | 5.44 | 6.16 | 15.86 | 23149 | 28516 | 2.99 | 3.32 |
| IV a- Sub humid southern plain & Aravalli hill zone (Sub humid) | Rajsamand | 3.40 | 10.00 | 25 | 3.98 | 5.1 | 28.14 | 27820 | 37900 | 3.48 | 4.74 |

I a- RT-351, RT-346, II b- RT-351, II-a RT-351

State Average yield: 3.40q/ha.

Performance of sesame CFLDs during Kharif 2016-17 in Rajasthan

During Kharif 2016-17, 537 CFLDs on RT-351 and RT-346, varieties of sesame along with packages were demonstrated in 226.8 ha area in Rajasthan by KVK Jodhpur-I, Churu-I, Jalore, Pali, Sirohi, Jaipur-I, Tonk, Bharatpur, Karauli, Dholpur, S. Madhopur, Rajsamand. The performance of sesame was

highest in Churu-I district where the productivity under CFLDs was 9.13 q/ha.

During Kharif 2016-17, 240 CFLDs on JS- 95-60 and JS- 95-60 varieties of soybean along with packages were demonstrated in 83 ha area in Rajasthan by KVK Bhilwara, Chittorgarh, Banswara and Dungarpur. The performance of soybean was highest in Sub humid southern plain & Aravali hill zone (IV A) where the yield under CFLDs was 12.04 q/ha.

Performance of soybean CFLDs conducted during Kharif 2016-17 in Rajasthan

| Agro Climatic Zone/Climate | KVKs | Dist. Avg. | g. (in | in of | Yield | Yield (q/ha) | | Net Return (Rs./ha) | | BCR | |
|---|-------------------------|----------------|--------|-------|-------|--------------|-------|------------------------|-------|-------|------|
| Zone/Climate | | (q/ha) | ha) | Demo | Check | Demo | | Check | Demo | Check | Demo |
| IV A Sub humid southern plain & Aravali hill zone | Bhilwara Chittorgarh | 10.34 12.47 | 40.00 | 82 | 10.03 | 12.04 | 25.15 | 15445 | 21747 | 1.62 | 1.80 |
| IV B Humid southern plain | Banswara Dungarpur | 8.45 10.36 | 43.00 | 158 | 7.15 | 9.18 | 29.85 | 7462 | 14496 | 1.53 | 1.93 |

IV a - JS- 95-60, IV b - JS- 95-60

Performance of Groundnut CFLDs in Gujarat during Kharif 2016-17 in Gujarat

| Agro Climatic | KVKs | Dist. Avg. | Area (in | No. of | Yield (q/ha) | | % increase | Net Return (Rs./ha) | | BCR | |
|---------------------|--|----------------------------------|----------|-----------|--------------|-------|------------|------------------------|-------|-------|------|
| Zone/Climate | | (q/ha) | ha) | Demo | Check | Demo | | Check | Demo | Check | Demo |
| South Gujarat | Tapi | 16.91 | 20.00 | 50 | 11.90 | 16.39 | 37.73 | 37190 | 59.09 | 2.58 | 3.41 |
| North Gujarat | Banaskantha Sabarkantha Mehsana Patan | 11.23 22.73 04.90 04.92 | 80.00 | 230 | 17.56 | 21.49 | 22.13 | 42966 | 61810 | 2.56 | 3.19 |
| North west arid | Kutch-I | 22.21 | 40.00 | 91 | 23.26 | 27.51 | 16.51 | 32741 | 40910 | 1.80 | 1.95 |
| North Saurashtra | Jamnagar Rajkot Bhavnagar Amreli | 14.25 11.35 13.19 10.01 | 62.00 | 152 | 19.88 | 22.44 | 22.99 | 36685 | 55932 | 2.17 | 2.72 |
| South Saurashtra | Junagardh | 15.78 | 20.00 | 50 | 20.25 | 22.80 | 12.62 | 47700 | 62164 | 2.22 | 2.69 |

South Gujarat-GG-20, North West arid-GT-34-A, North Saurashtra-GJG-9, South Saurashtra-GG-20 State yield: 13.85 q/ha



During Kharif 2016-17, 573 CFLDs on GG-20, GT-34-A and GJG-9 varieties of Groundnut along with packages were demonstrated in 222 ha area in Gujarat by KVK Tapi, Banaskantha, Sabarkantha, Mehsana, Patan, Kutch-I, Jamnagar, Rajkot, Bhavnagar, Amreli, and Junagardh. The performance of Groundnut was highest in Kutch district where the productivity under CFLDs was 27.51 q/ha.

During Kharif 2016-17, 163 CFLDs on GT-2, GT-3 and GT-4 varieties of Sesame along with packages were demonstrated in 66 ha area

in Gujarat by KVK Jamnagar, Rajkot, Amreli, and Junagardh. The performance of Sesame was highest in North Saurashtra where the yield under CFLDs was 8.17 q/ha.

During Kharif 2016-17, 274 CFLDs on NRC-37 and JS-335varieties of Soybean along with packages were demonstrated in 90 ha area in Gujarat by KVK Surat, Narmada, Dahod and Vadodara. The performance of Soybean was highest in Middle Gujarat zone where the productivity under CFLDs was 17.04 q/ha.

Performance of Sesame CFLDs in Gujarat during Kharif 2016-17

| Agro KVKs Climatic Zone/Climate | KVKs | Avg. (in of | | Yield | (q/ha) | % increase | Net Return (Rs./ha) | | BCR | | |
|---------------------------------------|------------------------------|-------------------------|-------|-------|--------|------------|------------------------|-------|-------|-------|------|
| | | (q/ha) | ha) | Demo | Check | Demo | | Check | Demo | Check | Demo |
| North Saurashtra | Jamnagar Rajkot Amreli | 04.83 01.45 03.27 | 46.00 | 115 | 7.29 | 8.17 | 10.77 | 24018 | 32144 | 2.47 | 3.01 |
| South Saurashtra | Junagarh | 03.95 | 20.00 | 47 | 6 | 7.18 | 19.72 | 17200 | 25445 | 2.01 | 2.64 |

North Saurashtra-GT-2, GT-3, GT-4, South Saurashtra-GT-3 State yield: 04.12 q/ha

Performance of Soybean CFLDs in Gujarat during Kharif 2016-17

| Agro Climatic | KVKs Dist. Area No. Yield (q/ha) Avg. (in of | | % increase | Net Return (Rs./ha) | | BCR | | | | | |
|-------------------|--|----------------|------------|------------------------|-------|-------|-------|-------|-------|-------|------|
| Zone/Climate | | (q/ha) | ha) | Demo | Check | Demo | | Check | Demo | Check | Demo |
| South Gujarat | Surat Narmada | 07.90 08.09 | 40.00 | 124 | 12.50 | 16.25 | 30.29 | 16200 | 26875 | 1.99 | 2.58 |
| Middle Gujarat | Dahod Vadodara | 07.87 08.32 | 60.00 | 150 | 14.93 | 17.04 | 18.35 | 22447 | 30555 | 2.15 | 2.47 |

South Gujarat-NRC-37, JS-335, Middle Gujarat-NRC-37 State yield: 07.97q/ha

Implementation of CFLDs during Rabi 2016-17 in Rajasthan & Gujarat

| Sl. | State | Crop | Sanct | ioned | Implemented | | |
|-----|-----------|---------|-------|-----------|-------------|-----------|--|
| No. | | | Demo | Area (ha) | Demo | Area (ha) | |
| 1. | Rajasthan | Mustard | 1650 | 660.00 | 1600 | 640 | |
| 2. | Gujarat | Mustard | 750 | 300.00 | 450 | 160 | |
| | | Total | 2400 | 960.00 | 2050 | 800 | |



During Rabi 2016-17, a total of 2050 Cluster Frontline Demonstrations (CFLDs) on Mustard were laid out in the 800 ha area against the sanctioned 2400 CFLDs in 960 ha area. Out

of 2050 planned demonstrations, 1600 CFLDs were conducted in 640 ha areas in Rajasthan while 450 demonstrations were laid out in 160 ha by KVKs functioning in Gujarat.

Performance of mustard demonstrations conducted during Rabi 2016-17 in Rajasthan

| Agro | KVKs Dist. Area No. Yield (q/ha) % | | % | Net Retur | n (Rs./ha) | BC | CR | | | | |
|--|---|---|------------|------------|------------|-------|----------|-----------|-----------|-------|------|
| Climatic Zone/Climate | | Avg. (q/ha) | (in ha) | of Demo | Check | Demo | increase | Check | Demo | Check | Demo |
| III a – semi arid eastern plain | Jaipur Ajmer Tonk Dausa | 10.23 07.14 09.37 14.62 | 80.00 | 189 | 14.94 | 17.66 | 18.57 | 35,025.75 | 45,523.00 | 2.68 | 3.00 |
| III b - Flood prone eastern plain zone (Semi arid) | Alwar-1 Bharatpur Karauli Dholpur | 13.91 13.91 14.95 11.45 | 80.00 | 200 | 18.33 | 22.33 | 21.88 | 39,556.50 | 52,320.00 | 2.43 | 2.83 |
| IV a- Sub humid southern plain & Aravalli hill zone (Sub humid) | Chittorgarh Udaipur Bhilwara Rajsamand Pratapgarh | 09.47 08.87 08.83 08.87 14.10 | 153.20 | 380 | 13.95 | 17.37 | 25.18 | 29,292.00 | 39,504.20 | 2.74 | 3.05 |
| IV b – humid southern plain | Dungarpur | 11.82 | 20.00 | 98 | 12.00 | 16.20 | 35.00 | 17,800.00 | 35,400.00 | 2.67 | 3.68 |
| I a -Arid western plains zone | Jodhpur Barmer-I | 14.00 06.90 | 60.00 | 126 | 12.24 | 16.31 | 35.91 | 26,504.25 | 38,846.25 | 2.62 | 3.32 |
| I b -Irrigated north western plain zone | Hanumangarh-I Sriganganagar | 10.70 11.65 | 40.00 | 100 | 15.64 | 17.74 | 13.47 | 38,025.00 | 48,023.50 | 2.87 | 3.21 |
| I c -Hyper arid and partially irrigated western plain | Bikaner-I Jaisalmer-I Churu-I | 09.58 11.00 09.88 | 70.00 | 165 | 12.23 | 15.55 | 26.96 | 24,655.67 | 35,625.56 | 2.33 | 2.76 |
| II a - Transitional plain of inland drainage | Sikar Jhunjhunu Nagaur | 13.15 05.55 11.99 | 157.20 | 368 | 15.62 | 19.21 | 23.26 | 33,993.14 | 43,188.43 | 2.64 | 2.94 |
| II b- Transitional plain of Luni basin | Pali Jalore Sirohi | 11.50 10.30 10.75 | 60.00 | 140 | 8.43 | 12.85 | 61.42 | 21,887.50 | 36,090.75 | 2.39 | 3.10 |
| V -Humid south eastern plain | Kota Jhalawar Bundi S. Madhopur Baran | 15.00 07.51 14.00 15.00 15.00 | 110.00 | 240 | 15.66 | 20.82 | 45.18 | 34,677.30 | 46,960.60 | 2.53 | 2.97 |

III b- NRCHB-101, RH-749, NRCDR-2, IV a- NRCDR-2, BR-50 & V- NRCHB-101, NRCDR-2 State Average yield: 11.83 q/ha.



Rajasthan is the largest producer of rapeseed-mustard. During Rabi 2016-17, mainly NRCHB-101, RH-749, NRCDR-2 and BR-50 were demonstrated in all the agro-climatic zones of Rajasthan. The performance of Mustard was highest in Flood prone eastern plain zone (Semi arid) where the average productivity under CFLDs was 22.33 q/ha.

During Rabi 2016-17, mainly NRCHB-101, GDM-4 and CS-52 were demonstrated in Gujarat. The performance of Mustard was highest in North Gujarat zone) where the average yield was 17.32 q/ha under package demonstration.

9.1 FLDs on Oilseed Crops (other than NMOOP)

Technology demonstrations on oilseed crops organized on an area of 1172.7hain the zone-VI.It includes an area of 775.6ha in Rajasthan and 397.1ha in Gujarat. Active involvement of 3017 farmers including farm women was ensured through the demonstrations

at their fields. The major kharif oilseeds undertaken were castor, groundnut, sesame and soybean while FLDs on mustard and niger were demonstrated in rabi season (2016-17).

9.1.1 FLDs organized by KVKs of Rajasthan

In Rajasthan, demonstrations were conducted on 2079 farmers' fields on oilseed crops. Crop wise performance of FLDs is given in table 9.2.

Castor: FLDs on castor crop were conducted by KVK, Sirohi on 40 farmers' fields in 16 ha land. From total 40 varietal demonstrations, the average yield was observed as 39.2 q/ha compared to local variety (31.2 q/ha). Varietal demonstrations' exhibited 25.64% higher yield with the BC ratio of 3.35 as compared to local practice (2.77).

Groundnut: FLDs on groundnut were conducted by Bikaner-II, Chittorgarh and Jaisalmer-II. KVKs on two components i.e., Integrated Crop Management (ICM) and varietal components. 90 farmers took part in groundnut

Performance of mustard demonstrations conducted during Rabi 2016-17 in Gujarat

| Agro | KVKs | Dist. | Area | No. | Yield | (q/ha) | % | Net Return (Rs./ha) | | BCR | |
|-----------------------|---------------------------------------|-------------------------|------------|------------|-------|--------|----------|---------------------|-----------|-------|------|
| Climatic Zone/Climate | | Avg. (q/ha) | (in ha) | of Demo | Check | Demo | increase | Check | Demo | Check | Demo |
| North Gujarat | Banaskantha-I Sabarkantha Patan | 15.94 14.50 07.60 | 60.00 | 150 | 13.21 | 17.32 | 32.09 | 29,966.00 | 46,263.39 | 2.77 | 3.68 |
| North west | Kutch-II | 13.40 | 20.00 | 28 | 13.18 | 15.00 | 13.81 | 38,000.00 | 65,000.00 | 2.41 | 3.17 |
| South Saurasthara | Junagadh | 10.00 | 20.00 | 42 | 8.00 | 9.84 | 23.04 | 7,750.00 | 5,164.82 | 1.47 | 1.85 |
| Bhal and costal | Bhavnagar | 15.00 | 10.40 | 20 | 11.50 | 14.42 | 25.39 | 12,429.00 | 22,552.99 | 1.85 | 2.08 |

North Gujarat-GDM-4, North west-CS-52, South Saurasthtra- GDM-4, Bhal and costal-NRCHB-101



Table 9.2 Performance of FLDs on Oilseed Crops in Rajasthan

| Crops/ No of | Theme | No. of | Area | W | eighted M | lean | BCR | | |
|---------------|---------------------|---------|--------|-------------------------|--------------------------|-----------------------------|--------|--------|--|
| KVKs | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check | |
| Castor (1) | Varietal evaluation | 40 | 16.00 | 39.2 | 31.2 | 25.64 | 1:3.35 | 1:2.77 | |
| Groundnut (3) | ICM | 17 | 6.40 | 42.77 | 30.61 | 39.73 | 1:5.59 | 1:4.71 | |
| | Varietal evaluation | 73 | 27.50 | 31.42 | 25.39 | 23.66 | 1:4.42 | 1:3.51 | |
| | Total | 90 | 33.90 | 33.56 | 26.37 | 26.69 | 1:4.66 | 1:3.73 | |
| Sesame (3) | ICM | 25 | 10.00 | 4.98 | 3.10 | 52.86 | 1:3.37 | 1:2.75 | |
| | Varietal evaluation | 200 | 80.00 | 4.75 | 3.74 | 33.38 | 1:5.30 | 1:4.31 | |
| | Total | 225 | 90.00 | 4.96 | 3.66 | 35.54 | 1:5.09 | 1:4.14 | |
| Soybean (10) | ICM | 60 | 13.00 | 16.80 | 15.61 | 17.70 | 1:2.27 | 1:2.31 | |
| | IPM | 623 | 220.00 | 14.61 | 11.62 | 8.68 | 1:1.91 | 1:1.65 | |
| | Varietal evaluation | 435 | 140.00 | 13.06 | 9.76 | 38.76 | 1:2.53 | 1:2.21 | |
| Mustard (11) | ICM | 85 | 40.00 | 21.44 | 15.63 | 37.16 | 1:2.62 | 1:2.38 | |
| | IPM | 20 | 50.00 | 16.5 | 12.03 | 22.90 | 1:2.49 | 1:2.21 | |
| | IDM | 38 | 15.20 | 18.48 | 17.45 | 19.22 | 1:2.25 | 1:1.95 | |
| | Varietal evaluation | 433 | 187.50 | 20.00 | 17.62 | 13.68 | 1:2.69 | 1:2.46 | |
| | Total | 606 | 262.70 | 19.59 | 16.88 | 16.85 | 1:2.63 | 1:2.39 | |
| | Total | 1118 | 373.00 | 14.11 | 11.06 | 31.73 | 1:2.12 | 1:1.84 | |
| | Grand Total | 2079 | 775.6 | 775.60 | | | | | |

demonstration during Kharif 2016. Overall, 26.69% more yield was recorded with 4.66 BC ratio. A maximum yield was recorded in ICM (39.73%) demonstration than varietal component.

Sesame: Demonstrations on sesame were conducted by 3 KVKs (Jodhpur-II, Rajsamand and Bhilwara) at 225 farmers fields on an area of 90ha. The highest yield of 4.98q/ha was recorded under ICM component followed by varietal (4.75 q/ha). The weighted mean yield of sesame was recorded 4.96 q/ha with an increase

of 35.54% yield. Hence, there is greater need to promote sesame production technology among farmers to increase the productivity at farmers' level.

Soybean: Total 10 KVKs (Banswara, Bundi, Chittorgarh, Jhalawar, Kota, Pratapgarh, Udaipur, Dungarpur, Baran and Bhilwara) conducted demonstrations at 1118 farmers' field over an area of 373 ha. The highest yield of 16.8 q/ha was recorded under ICM followed by IPM (14.61 q/ha)varietal component (13.06 q/ha). The percentage increase in yield was 38.76,





Input distribution FLD KVK Bundi

28.68 and 7.70 ICM, IPM and varietal respectively. Weighted mean yield of soya bean was 14.11 q/ha obtained under demonstration which was 31.73% higher over local check.

Mustard: FLDs on mustard crop were conducted by 11 KVKs (Jaipur-II, Bikaner-II, Jaipur-I, Alwar-II, Udaipur, Bharatpur, Nagour II, Jodhpur-II, Baran, Hanumangarh-II and Barmer-II) under four components, i.e., ICM, integrated pest management (IPM), Integrated disease management (IDM)and varietal druing rabi 2016-17. Total area under demonstration was 262.7 ha by including 606 farmers' fields. Overall, an increase of 16.85% yield was observed with 2.63 BC ratio. A maximum yield was recorded in ICM (37.16%) followed by IPM, IDM, and varietal components.

9.1.2 FLDs organized by KVKs of Gujarat

In Gujarat, FLDs were conducted on castor, groundnut, mustard, sesame and soybean crops (Table 9.3).

Castor: Castor is an important oilseeds of Gujarat state and 80 per cent area of Castor is covered in different parts of Gujarat. Demonstrations on castor crops conducted by 10



FLD on soybean KVK - Baran

KVKs (Banaskantha-I, Narmada, Banaskantha-II, Gandhinagar, Patan, Junagadh, Ahmedabad, Kutch-II, Anand and Amreli) on201 farmers' fields in an area of 94.4ha. The highest yield of 29.98q/ha was recorded under ICM followed by 28.95 q/ha under INM, Varietal evaluation (27.56 q/ha), RCT (20.90 q/ha), and integrated pest management (IPM) (20.80 q/ha). The percentage increase in yield was 15.73, 35.32, 14.50, 11.17 and 6.12 respectively. Overall the weighted mean yield of 26.81q/ha was obtained under FLDs which was 18.93% higher over local check.

Groundnut: FLDs on groundnut were undertaken by 8 KVKs (Sabarkantha, Kutch-II, Jamnagar, Rajkot-II, Surendranagar, Dangs, Tapi and Junagadh) on 390 farmers' fields in the area of 145.7 ha. The highest yield of 24.71q/ha was recorded under ICM followed by IDM (22.83 q/ha), IPM (22.66 q/ha), IWM (21.78 q/ha) and varietal (18.98 q/ha). Percentage increase in yield was 9.68, 16.91, 25.89, 5.42, and 21.85 respectively. The weighted mean yield of 20.38 q/ha was obtained under demonstrations which was 20.87% higher over local check (16.95 q/ha).



Table 9.3 Performance of FLDs on Oilseed Crops in Gujarat

| Crops (KVKs) | Theme | No. of | Area | W | eighted M | Iean | В | CR |
|--------------|---------------------|---------|--------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Castor (10) | ICM | 25.00 | 25.00 | 25.00 | 25.81 | 35.32 | 1:3.78 | 1:2.96 |
| | INM | 12.00 | 12.00 | 12.00 | 21.16 | 15.73 | 1:3.68 | 1:3.26 |
| | IPM | 10.00 | 10.00 | 10.00 | 19.60 | 6.12 | 1:3.41 | 1:3.28 |
| | RCT | 10.00 | 10.00 | 10.00 | 18.80 | 11.17 | 1:3.50 | 1:3.36 |
| | Varietal evaluation | 37.40 | 37.40 | 37.40 | 24.08 | 14.50 | 1:3.97 | 1:3.35 |
| | Total | 94.40 | 94.40 | 94.40 | 22.49 | 18.93 | 1:3.79 | 1:3.22 |
| Groundnut(8) | ICM | 24.00 | 24.00 | 24.00 | 18.00 | 25.89 | 1:3.20 | 1:1.44 |
| | IDM | 17.20 | 17.20 | 17.20 | 19.40 | 16.91 | 1:1.77 | 1:2.31 |
| | IPM | 6.00 | 6.00 | 6.00 | 22.53 | 9.68 | 1:1.99 | 1:1.75 |
| | Varietal evaluation | 93.50 | 93.50 | 93.50 | 15.67 | 21.85 | 1:2.67 | 1:3.12 |
| | IWM | 5.00 | 5.00 | 5.00 | 20.66 | 5.42 | 1:2.57 | 1:2.24 |
| | Total | 145.70 | 145.70 | 145.70 | 16.95 | 20.87 | 1:2.57 | 1:2.36 |
| Mustard (4) | ICM | 24.00 | 24.00 | 24.00 | 13.03 | 29.63 | 1:3.18 | 1:2.54 |
| | IPM | 4.00 | 4.00 | 4.00 | 20.40 | 9.80 | 1:2.35 | 1:2.23 |
| | Varietal evaluation | 64.00 | 64.00 | 64.00 | 18.04 | 27.20 | 1:2.96 | 1:2.66 |
| | Total | 92.00 | 92.00 | 92.00 | 16.84 | 27.08 | 1:2.97 | 1:2.62 |
| Niger(1) | Varietal evaluation | 6.00 | 6.00 | 6.00 | 3.97 | 18.67 | 1:2.46 | 1:2.11 |
| Sesame (1) | Varietal Evaluation | 4.00 | 4.00 | 4.00 | 4.90 | 8.37 | 1:2.66 | 1:2.54 |
| Soybean (4) | ICM | 15.00 | 15.00 | 15.00 | 10.14 | 35.74 | 1:2.07 | 1:1.40 |
| | IPM | 10.00 | 10.00 | 10.00 | 12.70 | 6.30 | 1:2.46 | 1:2.37 |
| | Varietal Evaluation | 30.00 | 30.00 | 30.00 | 16.87 | 7.39 | 1:2.74 | 1:2.52 |
| | Total | 55.00 | 55.00 | 55.00 | 14.28 | 14.92 | 1:2.47 | 1:2.13 |
| | Grand Total | 938 | 397.10 | 397.10 | 397.10 | | | |

Sesame: Demonstrations on sesame were undertaken by KVK Surendranagar over an area of 4 ha in 10 farmers' fields. From total 10varietal demonstrations, the average yield was observed as 5.31 q/ha compared to local variety (4.93 q/ha). Varietal demonstrations' exhibited 8.37% higher yield with the BC ratio of 2.74 as compared to local practice (2.54).

Soybean: Demonstrations were conducted by 4 KVKs (Dahod, Tapi, Narmada and Bharuch) at 167 farmers' fields on an area of 55 ha. The highest yield of 18.12 q/ha was recorded under



ICM followed by varietal (13.60 q/ha) and IPM (13.50 q/ha). The percentage yield increase recorded as 7.39%, 35.74% and 6.30%, respectively. The weighted mean of yield was recorded as 16.05 q/ha which is 14.92% higher than local check.

Mustard: Demonstrations were undertaken by 4 KVKs i.e.,Panchmahal, Anand, Banaskantha-II and Kutch-II at 130 farmers' fields covering an area of 92 ha. The maximum yield of 22.95 q/ha was recorded under varietal evaluation followed by IPM (22.40 q/ha) and ICM (16.20 q/ha). The percentage increase yield was 27.20, 9.80, and 29.63, respectively. The weighted mean yield of mustard was 21.17q/ha which is 27.08% higher than check.

Niger: FLDs on niger crop were conducted by KVK, Dangs on 40 farmers' fields in 6 ha land. From total 40 varietal demonstrations, the average yield was observed as 4.83 q/ha compared to local variety (3.97 q/ha). Varietal demonstrations' exhibited 18.67% higher yield with the BC ratio of 2.46 as compared to local practice (2.11).

9.2 FLDs on Pulse Crops other than NFSM

FLDs on pulse production technology were organized on an area of 577.18 ha involving 1630 farmers of Rajasthan & Gujarat. Under the pulses demonstrations, Rajasthan covered 241.5 ha area in the 592 farmers fields while in Gujarat, 335.68 ha area FLDs were laid out 1038 farmers' fields. FLDs on blackgram, green gram, cow pea and mothbean were undertaken in kharif while production potential of chickpea were demonstrated in rabi season (2016-17).

9.2.1 Details of FLDs organized by KVKs of Rajasthan

Demonstrations on pulse crops were conducted on 592 farmers' fields in an area of 241.5 ha.

- 1. Black gram: FLDs on black gram were undertaken by KVK Rajsamand at 25 farmers' fields in 10 ha area. Out of 25 varietal component The highest yield of 7.58 q/ha was recorded whereas local check yield was 6.02 Q/ha The percentage increase in demonstration yield was 25.91% over local check.
- **2. Green gram:** Total 9 KVKs (Jodhpur-I, Bikaner-II, Churu-II, Nagour II, Jaisalmer-II, Jodhpur-II, Dungarpur, Rajsamand and Hanumangarh-II) conducted demonstrations on green gram at 254 farmers' fields covering an area of 93 ha. The highest yield of 9.72 q/ha was recorded under ICM followed by varietal evaluation (9.09 q/ha). The percentage increase in yield was 35.25 and 30.23, respectively. Overall, average productivity of 9.24 q/ha was recorded under demonstrations than local check (7.06 q/ha)as depicted in Table 9.4.
- **3. Cow pea:** Demonstrations on cowpea were undertaken by KVK Churu-II over an area of 10 ha in 25 farmers' fields during Kharif 2016-17. From total 25 varietal demonstrations, the average yield was observed as 11.84 q/ha compared to local variety (9.99 q/ha). Varietal demonstrations' exhibited 18.51% higher yield with the BC ratio of 2.90 as compared to local practice (2.52).
- **4. Moth bean:** FLDs on moth bean were undertaken by KVK Jodhpur-I, Bikaner-II and Barmer-II on 70 farmers' fields in an area of 30



| Crops (KVKs) | Theme | No. of | Area | W | eighted N | Aean | В | CR |
|----------------|---------------------|---------|-------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Black gram (1) | Varietal evaluation | 25 | 10.00 | 7.58 | 6.02 | 25.91 | 1:3.31 | 1:2.63 |
| Green gram (9) | ICM | 49 | 22.00 | 9.72 | 7.06 | 35.25 | 1:4.70 | 1:3.72 |
| | Varietal evaluation | 205 | 71.00 | 9.09 | 7.06 | 30.23 | 1:3.43 | 1:2.93 |
| | Total | 254 | 93.00 | 9.24 | 7.06 | 31.42 | 1:3.68 | 1:3.09 |
| Cow pea (1) | Varietal evaluation | 25 | 10.00 | 11.84 | 9.99 | 18.51 | 1:2.90 | 1:2.52 |
| Moth bean (3) | ICM | 45 | 20.00 | 7.98 | 6.25 | 27.64 | 1:3.66 | 1:3.20 |
| | Varietal evaluation | 25 | 10.00 | 3.75 | 3.10 | 20.97 | 1:1.68 | 1:1.38 |
| | Total | 70 | 30.00 | 6.57 | 5.20 | 25.42 | 1:2.90 | 1:2.52 |
| Chickpea (10) | ICM | 78 | 39.00 | 19.64 | 14.58 | 38.22 | 1:3.69 | 1:2.92 |
| | IDM | 18 | 7.00 | 18.46 | 16.30 | 14.10 | 1:3.19 | 1:3.06 |
| | Varietal evaluation | 122 | 52.50 | 15.76 | 12.89 | 22.31 | 1:3.52 | 1:2.97 |
| | Total | 218 | 98.50 | 17.49 | 13.80 | 28.02 | 1:3.57 | 1:2.96 |
| | Grand Total | 592 | 241.5 | 241.50 | | | | |

Table 9.4 Performance of FLDs on Pulse Crops in Rajasthan

ha. Under ICM production was 7.98 q/ha while in varietal demonstration the production was 3.75 q/ha.

5. Chickpea (Gram): Demonstrations on chickpea were undertaken by 10 KVKs (Jaipur-II, Bikaner-II, Tonk, Alwar-II, Hanumangarh-I, Nagaur II, Jaisalmer-II, Jodhpur-II, Churu-II and Hanumangarh-II) on 218 farmers' fields in an area of 98.5 ha. The highest yield of 19.64 g/ha was recorded under ICM followed by IDM 18.46 g/ha and varietal component (15.76 g/ha). The percentage increase in yield was observed as 38.22, 14.10, and 22.31 respectively. The weighted mean yield of 17.49 q/ha was obtained under demonstrations which was 28.02% higher over local check.

9.2.2 FLDs organized by KVKs of Gujarat

FLDs on pulses were conducted by KVKs of Gujarat state (Table 9.5). FLDs were conducted at 1038 farmers field in an area of 335.68 ha area during rabi 2016-17.

Black gram: FLDs on black gram were undertaken by KVK Valsad at 50 farmers' fields in 5 ha area during kharif 2016. Out of 50 ICM demonstration the yield of 2.84g/ha was recorded in demonstration whereas local check yield was 2.25 g/ha The percentage increase in demonstration yield was 26.22% over local check. Due to heavy rains during flower and pod formation stage black gram yield was found very low under Front Line Demonstration programme.



Table 9.5 Performance of FLDs on Pulses demonstrations in Gujarat

| Crops (KVKs) | Theme | No. of | Area (ha) | W | eighted M | ean | BCR | | |
|-----------------|---------------------|---------|-----------|-------------------------|--------------------------|-----------------------------|--------|--------|--|
| | | farmers | | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check | |
| Blackgram (1) | ICM | 50 | 5.00 | 2.84 | 2.25 | 26.22 | 1:1.73 | 1:1.68 | |
| Green gram (11) | ICM | 50 | 20.00 | 9.95 | 7.50 | 32.67 | 1:2.85 | 1:2.58 | |
| | INM | 75 | 25.00 | 8.72 | 7.12 | 21.75 | 1:2.23 | 1:1.80 | |
| | Varietal evaluation | 468 | 147.80 | 7.79 | 6.49 | 20.02 | 1:2.89 | 1:2.68 | |
| | Total | 593 | 192.80 | 8.14 | 6.68 | 21.55 | 1:2.79 | 1:2.51 | |
| Frenchbean(1) | INM | 25 | 5.00 | 31.00 | 26.50 | 16.98 | 1:4.40 | 1:3.96 | |
| Pigeon pea (6) | ICM | 14 | 5.80 | 18.28 | 15.97 | 14.86 | 1:3.05 | 1:2.90 | |
| | IDM | 26 | 10.00 | 15.49 | 14.33 | 8.53 | 1:2.99 | 1:3.72 | |
| | Varietal evaluation | 78 | 30.00 | 9.63 | 8.00 | 21.36 | 1:3.22 | 1:2.67 | |
| Chickpea (4) | ICM | 25 | 10.00 | 16.20 | 14.30 | 13.29 | 1:3.69 | 1:3.46 | |
| | IDM | 56 | 22.00 | 14.64 | 13.85 | 5.66 | 1:3.45 | 1:3.30 | |
| | IPM | 35 | 14.00 | 14.97 | 14.01 | 6.82 | 1:3.42 | 1:3.35 | |
| | Varietal evaluation | 136 | 41.08 | 13.33 | 10.60 | 27.41 | 1:3.10 | 1:3.03 | |
| | Total | 252 | 87.08 | 14.25 | 12.40 | 16.98 | 1:3.33 | 1:3.22 | |
| | Total | 118 | 45.80 | 12.00 | 10.39 | 17.73 | 1:3.13 | 1:3.00 | |
| | Grand Total | 1038 | 335.68 | | | | | | |

Frenchbean: FLDs on frenchbean were undertaken by KVK Dangs on 25 farmers' fields in 5 ha area. Out of 25 INM demonstration the highest yield of 31.00 q/ha was recorded whereas local check yield was 26.50 q/ha The percentage increase in demonstration yield was 16.98% over local check with B:C ratio of 4.40.

Greengram: A total of 11 KVKs (Panchmahal, Banaskantha-II, Dahod, Anand, Tapi, Kutch-II, Dangs, Jamnagar, Surendranagar, Kheda and Valsad) conducted demonstrations on green gram on 593 farmers' fields in an area of 192.8 ha. Farmers obtained more yield under ICM in comparison to INM and varietal components.

Pigeonpea: Demonstrations on pigeonpea were undertaken by 6 KVKs (Narmada, Rajkot-I, Surat, Dangs, Tapi and Dahod) on118 farmers' fields on an area of 45.8 ha during kharif 2016-17. Medium duration pigeonpea (160-165 days) varieties along with other package technologies were demonstrated. Maximum yield advantage was reported in ICM followed by IDM (15.49 q/ha) and varietal (9.63 q/ha).

Chickpea: FLDs on chickpea production technology were undertaken by 4 KVKs (Dahod, Dangs, Tapi and Rajkot-II) on 252 farmers' fields having an area of 87.08 ha. The maximum yield i.e., 16.20 q/ha was observed in ICM (18.28 q/ha) followed by the IPM (14.97



q/ha), IDM (14.64 q/ha), and varietal (13.33 q/ha).

9.3 FLDs on Cereal Crops

FLDs on cereal crops were conducted at 3994 farmers' fields in an area of 1375.3 ha during kharif & rabi 2016-17. In Rajasthan, 1947 farmers' fields were covered under FLDs on cereals with an area of 721.1 ha. In Gujarat, 2047 farmers' fields were covered under FLDs on cereals with an area of 654.2 ha.

9.3.1 Details of FLDs on cereal crops in Rajasthan

The major crops of Rajasthan on which FLDs undertaken are wheat, barley, maize and paddy. The detailed information of FLDs on cereal crops are depicted in Table 9.6.

Wheat: Demonstrations were conducted on 1092 farmers' fields covering an area of 421.8 ha by 25 KVKs (Ajmer, Alwar-II, Sikar, Jaipur-II, Bikaner-II, Pali, Churu-II, Banswara, Bundi, Jhalawar, Kota, Pratapgarh, Jaipur-I, Sawai Madhopur, Dausa, Bharatpur, Dholpur, Jhunjhunu, Nagaur-II, Baran, Chittorgarh, Rajsamand, Sirohi, Hanumangarh-I and Hanumangarh-II). Farmers have followed situation specific technological packages including suitable varieties. Maximum yield was reported in Integrated Crop Management (40.97 g/ha) followed by IDM (37.69 g/ha) and varietal (36.89 g/ha). Majority of farmers kept seeds of imporved varieties of wheat for coming rabi (2017-18) multiplication.

Table 9.6 Performance of FLDs on Cereal Crops in Rajasthan

| Crops | Theme | No. of | Area | W | eighted Me | ean | BCR | | |
|------------|---------------------|---------|--------|-------------------------|--------------------------|-----------------------------|--------|--------|--|
| (KVKs) | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check | |
| Wheat(26) | ICM | 16 | 8.00 | 37.69 | 34.81 | 8.27 | 1:2.21 | 1:2.05 | |
| | IDM | 687 | 270.80 | 36.89 | 31.54 | 17.74 | 1:2.83 | 1:2.48 | |
| | Varietal evaluation | 389 | 143.00 | 40.97 | 34.68 | 22.44 | 1:2.68 | 1:2.32 | |
| Barley(13) | ICM | 213 | 74.00 | 46.40 | 39.17 | 18.23 | 1:2.63 | 1:2.63 | |
| | Varietal evaluation | 200 | 68.50 | 38.73 | 31.71 | 23.31 | 1:3.23 | 1:2.82 | |
| | Total | 413 | 142.50 | 42.71 | 35.58 | 20.67 | 1:2.85 | 1:2.71 | |
| Maize(4) | ICM | 200 | 80.00 | 40.08 | 30.23 | 39.03 | 1:2.64 | 1:2.22 | |
| | Varietal evaluation | 150 | 40.00 | 26.75 | 17.64 | 51.51 | 1:3.34 | 1:2.71 | |
| | Total | 350 | 120.00 | 35.64 | 26.03 | 43.19 | 1:2.79 | 1:2.32 | |
| Paddy(3) | ICM | 67 | 26.80 | 48.48 | 43.35 | 12.23 | 1:2.89 | 1:2.59 | |
| | Varietal evaluation | 25 | 10.00 | 35.45 | 21.50 | 64.88 | 1:2.63 | 1:1.67 | |
| | Total | 92 | 36.80 | 44.94 | 37.41 | 26.54 | 1:2.85 | 1:2.45 | |
| | Total | 1092 | 421.80 | | | | | | |
| | Grand Total | 1947 | 721.10 | 45.64 | 39.07 | 17.29 | 1:3.51 | 1:3.10 | |





FLD on wheat KVK Bundi

Barley: 13 KVKs (Sikar, Jaipur-II, Pali, Churu - II, Sriganganagar, Jaipur-I, Bharatpur, Dausa, Churu-II, Nagour II, Dungarpur, Rajsamand and Hanumangarh-II) conducted demonstrations on 413 farmers' fields over an area of 142.50 ha. An average 20.67 percent yield increase was noticed.

Maize: Demonstrations on maize were undertaken by 4 KVKs (Banswara, Pratapgarh, Dungarpur and Rajsamand) on 350 farmers' fields covering an area of 120 ha. Maize productivity has been reported maximum in Banswara and lowest in Rajsamand district during kharif 2016.

Paddy: Demonstrations on paddy were conducted by 3 KVKsBundi, Kota and Dungarpur on 92 farmers' fields covering an area of 36.8ha. Average yield 44.94 q/ha was obtained by majority of farmers under ICM component. Farmers showed positive response and viewed that area area under paddy will enhance in near future in these districts.

9.3.2 FLDs organized by KVKs of Gujarat

The major crops on which FLDs were undertaken in Gujarat are maize, oat, paddy and wheat. The area under FLDs was 649.20 ha. The FLDs were demonstrated on 2035 farmers' fields. Performance of FLDs on cereal crops are depicted in table 9.7.

Maize: Demonstrations on maize crop were undertaken by KVK Dahod on 50 farmers' fields over an area of 20haduring Kharif 2016. Farmers obtained average yield of 14.50 q/ha under varietal component.

Paddy: Demonstrations were undertaken by 10 KVKs (Anand, Surat, Navsari, Narmada, Valsad, Ahmedabad, Kheda, Dangs, Tapi and Bharuch) on 1374 farmers' fields over an area of 360.8 ha during kahrif 2016. Average yield 36.81 q/ha was obtained by majority of farmers under ICM component with average increase of 16.30 per cent.



Table 9.7 Performance of FLD on Cereal Crops in Gujarat

| Crops | Theme | No. of | Area | V | Veighted Me | an | ВС | CR |
|-----------|---------------------|---------|--------|-------------------------|--------------------------|-----------------------------|--------|--------|
| (KVKs) | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Maize(1) | Varietal component | 50 | 20.00 | 14.50 | 12.80 | 13.28 | 1:1.72 | 1:1.57 |
| Paddy(10) | ICM | 5 | 10.00 | 53.22 | 50.21 | 6.35 | 1:2.23 | 1:1.79 |
| | IDM | 883 | 204.40 | 35.65 | 35.90 | 22.00 | 1:2.41 | 1:1.85 |
| | INM | 30 | 20.00 | 50.80 | 42.90 | 18.41 | 1:2.40 | 1:1.90 |
| | IPM | 128 | 38.40 | 41.34 | 38.72 | 7.44 | 1:1.99 | 1:1.84 |
| | Varietal component | 328 | 88.00 | 34.87 | 29.76 | 18.64 | 1:2.14 | 1:1.88 |
| | Total | 1374 | 360.80 | 36.81 | 31.09 | 16.30 | 1:2.27 | 1:1.82 |
| Wheat(19) | ICM | 118 | 67.00 | 39.48 | 30.92 | 28.10 | 1:2.56 | 1:2.04 |
| | INM | 224 | 102.00 | 31.37 | 27.60 | 14.31 | 1:2.35 | 1:2.25 |
| | IPM | 25 | 10.00 | 37.20 | 31.30 | 18.85 | 1:2.24 | 1:2.03 |
| | Varietal evaluation | 244 | 89.40 | 36.19 | 31.57 | 16.04 | 1:2.31 | 1:1.96 |
| | Total | 611 | 268.40 | 30.97 | 26.22 | 16.32 | 1:2.36 | 1:2.07 |
| | Grand Total | 2035 | 649.20 | | | | | |

Wheat: Demonstrations on wheat crop was undertaken by 19 KVKs (Banaskantha-I, Sabarkantha, Bharuch, Patan, Banaskantha-II, Rajkot-I, Kutch-II, Ahmedabad, Tapi, Jamnagar, Junagadh, Porbandar, Dahod, Anand, Amreli, Rajkot-II, Surendranagar, Mehsana and Gandhinagar) on 515 farmers field covering an area of 268.4 ha during 2016-17. Majority of farmers used seed of improved varieties.

9.4 FLDs on Commercial Crops

FLDs on commercial crops were conducted at 459 farmers' fields in an area of 176.60 ha in 2016-17 in Zone-VI. In Rajasthan, 40 farmers' fields were covered under FLDs on cotton with an area of 16.00 ha. In Gujarat, 419 farmers' fields were covered under FLDs on commercial crops with an area of 160.60 ha. The details are given in Table 9.8.

Table 9.8 Performance of FLD on Cotton in Rajasthan

| Crops (KVKs) | | | No. of Area | | Weighted Mean | | | | |
|-----------------|-------------|------|-------------------------|--------------------------|-----------------------------|-------|--------|--------|--|
| (KVKs) | farmers (h | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check | | |
| Cotton(1) | ICM | 40 | 16.00 | 23.41 | 21.01 | 11.36 | 1:3.52 | 1:3.24 | |
| | Total | 40 | 16.00 | 23.41 | 21.01 | 11.36 | 1:3.52 | 1:3.24 | |
| | Grand Total | 40 | 16.00 | | | | | | |



Cotton: FLDs on cotton were undertaken by KVK Sriganganar on 40 farmers' fields in 16 ha area. Out of 25 ICM demonstration the weighted mean yield of 23.41 q/ha was recorded whereas local check yield was 21.01 q/ha The percentage increase in demonstration yield was 11.36% over local check with B:C ratio of 3.52.

9.4.1 FLDs on commercial crops organized by KVKs of Gujarat

The performance of demonstration is illustrated in Table 9.9.

Cotton: More than 1.00 million ha area is covered under Cotton crop including potential districts of Gujarat. Now farmers have shown their interest in cultivation of Bt. Cotton. FLDs on cotton were undertaken by 16 KVKs (Banaskantha-I, Sabarkantha, Narmada, Rajkot-I, Ahmedabad, Junagadh, Porbandar, Anand, Tapi, Jamnagar, Rajkot-II, Mehsana, Amreli, Surendranagar, Gandhinagar and Kutch-I) on

353 farmers' fields in 139.6 ha area. The highest yield of 25.57 q/ha was recorded in ICM followed by IPM (20.44 q/ha), varietal component (20.26 q/ha) and INM (13.69 q/ha). The percent increase was 13.53, 13.14, 12.37 and 16.86 respectively. Thematic area wise weighted mean yield was 19.27 q/ha was obtained under demonstration which was 14.17% higher over local check.

Sugarcane: Sugarcane is grown in South part of Gujart and this crop is treated as remunerative for enhancing income of farmers. Farmers have shown interest to participate in sugarcane cultivation. FLDs on sugarcane were undertaken by 4 KVKs (Junagadh, Surat, Valsad and Navsari) on 66 farmers' fields over an area of 21 ha. Farmers received very attractive remunerative price as well as benefit from sugarcane demonstrations. They have assured that demonstrated technology will be used in coming next season. Farmers also viewed that

Table 9.9 Performance of FLDs on commercial crops in Gujarat

| Crops | Theme | No. of | Area | W | eighted Mea | n | ВС | CR |
|--------------|---------------------|---------|--------|-------------------------|--------------------------|---------------------------------|--------|--------|
| (KVKs) | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increas e in yield (%) | Demo | Check |
| Cotton(16) | ICM | 101 | 40.40 | 25.57 | 22.46 | 13.53 | 1:4.90 | 1:4.23 |
| | INM | 52 | 22.00 | 13.69 | 11.75 | 16.86 | 1:2.35 | 1:2.10 |
| | IPM | 142 | 57.00 | 20.44 | 18.11 | 13.14 | 1:3.03 | 1:2.74 |
| | Varietal Evaluation | 58 | 20.20 | 20.26 | 17.98 | 12.37 | 1:2.86 | 1:2.47 |
| | Total | 353 | 139.60 | 19.27 | 16.94 | 14.17 | 1:3.09 | 1:2.75 |
| Sugarcane(4) | IPM | 24 | 10.00 | 595.91 | 528.35 | 17.45 | 1:3.65 | 1:3.18 |
| | Varietal evaluation | 32 | 7.00 | 1112.70 | 1017.35 | 9.22 | 1:2.89 | 1:2.55 |
| | IWM | 10 | 4.00 | 936.80 | 80958.00 | 15.71 | 1:2.21 | 1:2.05 |
| | Total | 66 | 21.00 | 1849.85 | 16011.28 | 14.38 | 1:3.02 | 1:2.68 |
| | Grand Total | 419 | 160.60 | | | | | |



neighboring villagers have already assured for lifting quality materials (seeds) for cultivation of sugarcane in coming season.

9.5 FLDs on other crops

Cluster bean: Fifteen KVKs (Jodhpur-I, Dholpur, Sikar, Jaipur-II, Bikaner-II, Pali, Jaipur-I, Alwar-II, Alwar-I, Jalore, Churu-II, Nagour II, Jodhpur-II, Hanumangarh-II,

Barmer-II) conducted demonstrations on 486 farmers' fields covering an area of 193.5 ha. The highest yield of 13.5 q/ha. was recorded under ICM followed by IDM (11.97 q/ha) and Varietal evaluation (9.0 q/ha).

Cluster bean: Demonstrations were undertaken by KVK Kutch-I on 11 farmers' fields over an area of 4.4 ha.

| Crops (KVKs) | Theme | No. of | Area | W | eighted N | BCR | | |
|------------------|---------------------|---------|--------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Cluster bean(15) | ICM | 20 | 10.00 | 13.50 | 9.61 | 31.07 | 1:2.34 | 1:2.10 |
| | IDM | 244 | 100.00 | 11.97 | 10.30 | 25.81 | 1:4.05 | 1:3.69 |
| | Varietal evaluation | 222 | 83.50 | 9.00 | 7.58 | 19.20 | 1:2.46 | 1:2.20 |
| | Total | 486 | 193.50 | 10.77 | 8.77 | 23.23 | 1:2.47 | 1:2.21 |

| Crops (KVKs) Theme | No. of | Area | We | eighted Mo | ean | В | CR | |
|--------------------|---------------------|---------|------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Cluster bean (1) | Varietal evaluation | 11 | 4.40 | 9.78 | 7.95 | 23.02 | 1:2.16 | 1:2.02 |



FLD - Clusterbean KVK Kutch-I

9.6 FLDs on Fodder Crops

Fodder is an important ingredient for managing health as well as enhancing milk yields of cows, buffalo, goat, etc. and proper and balance dose fo fodder also improve draft power of animals. Concerned Subject Matter Specialists analysed gaps between recommended and existing pattern of fodder use and feeding uptake in cow, buffalo, goat, etc and accordingly Frontline Demonstrations were finalized and organized during 2016-17 in

Rajasthan and Gujarat. State-wise performance of FLDs on fodder is as follows:

9.6.1 Details of FLDs organized in Rajasthan

FLDs were conducted at 375 locations in 88.8 ha. Area in Rajasthan. FLDs were conducted on berseem, dhaman grass, napier, lucerne, pearlmillet, oat, and sorghum and the details are given in table 9.10.

Barseem: Demonstrations were undertaken by 3 KVK (Dholpur, Sawai Madhopur and Alwar-I)

Table 9.10 Performance of FLDs on Fodder Crops in Rajasthan

| Crops (KVKs) | Theme | No. of | Area | W | eighted Mo | ean | BCR | |
|------------------|---------------------|---------|-------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Barseem (3) | Varietal evaluation | 51 | 5.00 | 532.00 | 466.40 | 14.09 | 1:3.70 | 1:3.41 |
| | ICM | 25 | 1.00 | 1054.00 | 717.00 | 47.00 | 1:3.84 | 1:3.12 |
| | Total | 76 | 6.00 | 619.00 | 508.17 | 19.58 | 1:3.73 | 1:3.35 |
| Dhaman (1) | Varietal Evaluation | 5 | 1.00 | 36.00 | 29.00 | 24.14 | 1:1.38 | 1:1.20 |
| | Total | 5 | 1.00 | 36.00 | 29.00 | 24.14 | 1:1.38 | 1:1.20 |
| Lucerne (2) | Varietal Evaluation | 12 | 1.40 | 503.29 | 449.43 | 12.19 | 1:6.06 | 1:5.67 |
| | Total | 12 | 1.40 | 503.29 | 449.43 | 12.19 | 1:6.06 | 1:5.67 |
| Pearlmillet (1) | Varietal Evaluation | 8 | 1.00 | 320.00 | 230.00 | 39.13 | 1:1.53 | 1:1.21 |
| | Total | 8 | 1.00 | 320.00 | 230.00 | 39.13 | 1:1.53 | 1:1.21 |
| Oat (6) | ICM | 40 | 40.00 | 357.25 | 258.50 | 38.20 | 1:2.12 | 1:1.62 |
| | Varietal evaluation | 89 | 11.40 | 311.35 | 238.86 | 28.94 | 1:3.13 | 1:2.60 |
| | Total | 129 | 51.40 | 347.07 | 254.15 | 36.15 | 1:2.25 | 1:1.75 |
| Napier grass (1) | ICM | 20 | 5.00 | 204.50 | 149.40 | 36.88 | 1:4.24 | 1:2.86 |
| | Total | 20 | 5.00 | 204.50 | 149.40 | 36.88 | 1:4.24 | 1:2.86 |
| Sorghum (3) | ICM | 80 | 13.00 | 230.83 | 198.86 | 14.72 | 1:2.08 | 1:1.83 |
| | Varietal evaluation | 45 | 10.00 | 87.20 | 65.00 | 34.15 | 1:1.91 | 1:1.10 |
| | Total | 125 | 23.00 | 168.38 | 140.66 | 23.17 | 1:2.02 | 1:1.61 |
| | Grand Total | 375 | 88.80 | | | | | |



Fodder Demonstration KVK Alwar-I

on 76 farmers' fields in an area of 6.00ha. under irrigated situation during October, 2016. Farmers did seven (7) cutting of Berseem. In corporation of Berseem as green fodder with wheat straw improved health of animals and increased milk per day of milch animals.

Dhaman: Demonstrations were undertaken by KVK Barmer-Iat 5 farmers' fields in an area of 1.00 ha. Dhaman grass in mainly grown in rainfed dry land situation

Lucern: Demonstration were undertaken by 2 KVK (Barmer-I and Hanumangarh-II) on 12 farmers' fields over an area of 1.40 ha. Lucern is most suitable green fodder of Rajasthan. Majority of farmers are ready to cultivate Lucern as green fodder in coming season.

Pearlmillet: Demonstrations were undertaken by 1 KVK Alwar-II on 8 farmers' fields in an area of 1 ha. Pearlmillet has become popular among farming community. There is ample

opportunity to promote pearlmillet as fodder during kharif season in different parts of Rajasthan.

Oat: Demonstrations were undertaken by 6 KVKs Sawai Madhopur, Jhunjhunu, Alwar-II, Pali, Barmer-I and Hanumangarh-II) on 129 farmers' fields in an area of 51.4 ha. Two cutting of Oat could be done under partial irrigated condition.

Napier grass: Demonstrations were undertaken by KVKs Pali at 20 farmers' fields in an area of 5 ha. Farmers have accepted utility of Napier grass and area will increase in coming year.

Sorghum: Demonstrations were undertaken by 3 KVKs (Pali, Barmer-I and Alwar-I) at125 farmers' fields over an area of 23 ha. during Kharif 2016. Sorghum as fodder improves digestibility as well as uptake of feeds ultimately help in increasing milk yield.



9.6.2 FLDs organized by KVKs of Gujarat

In Gujarat, FLDs on fodder crops were conducted on 367 locations in 131.3 ha. area. FLDs were conducted on Barley, Makhan grass, guinea grass, hybrid napier, lucerne, Pearlmillet, oat and sorghum (Table 9.11).

Barley: Demonstrations were undertaken by 1 KVK Kutch-II on 19 farmers' fields covering an area of 7.6 ha. Barley fodder is nutritive rich, platable and can be easily grown in water stress condition.

Guinea grass: Demonstrations were undertaken by 1 KVK Anand on 10 farmers' fields covering an area of 10 ha. Guinea grass is nutritive rich, palatable and can be easily grown in water stress condition

Lucern: FLDs on lucerne were undertaken by 3 KVKs (Porbandar, Baroda and Mehsana) on 47 farmers' fields in an area of 15 ha. during rabi 2016-17. Farmers fetched good remuneration as well as quality fodder.

Table 9.11 Performance of FLDs on Fodder Crops in Gujarat

| Crops (KVKs) | Theme | No. of | Area | Weig | ghted Mea | an | В | CR |
|------------------|---------------------|---------|--------|----------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Barley (1) | Varietal evaluation | 19 | 7.60 | 471.85 | 394.47 | 19.66 | 1:2.85 | 1:2.58 |
| | Total | 19 | 7.60 | 471.85 | 394.47 | 19.66 | 1:2.85 | 1:2.58 |
| Guinea grass (1) | Varietal evaluation | 10 | 10.00 | 650.00 | 440.00 | 47.73 | 1:5.56 | 1:2.55 |
| | Total | 10 | 10.00 | 650.00 | 440.00 | 47.73 | 1:5.56 | 1:2.55 |
| Lucerne (3) | Varietal evaluation | 47 | 15.00 | 752.00 | 678.67 | 10.86 | 1:3.06 | 1:2.65 |
| | Total | 47 | 15.00 | 752.00 | 678.67 | 10.86 | 1:3.06 | 1:2.65 |
| Makhan grass (1) | Varietal evaluation | 5 | 2.00 | 693.00 | 650.00 | 6.62 | 1:2.69 | 1:2.64 |
| | Total | 5 | 2.00 | 693.00 | 650.00 | 6.62 | 1:2.69 | 1:2.64 |
| Napier grass (1) | Varietal Evaluation | 14 | 2.00 | 38.10 | 34.30 | 11.08 | 1:1.59 | 1:1.45 |
| | Total | 14 | 2.00 | 38.10 | 34.30 | 11.08 | 1:1.59 | 1:1.45 |
| Oat (6) | Varietal evaluation | 189 | 69.20 | 407.74 | 356.76 | 14.10 | 1:2.54 | 1:2.29 |
| | Total | 189 | 69.20 | 407.74 | 356.76 | 14.10 | 1:2.54 | 1:2.29 |
| Pearlmillet (1) | Varietal Evaluation | 15 | 1.50 | 491.00 | 448.00 | 9.60 | 1:1.38 | 1:1.27 |
| | Total | 15 | 1.50 | 491.00 | 448.00 | 9.60 | 1:1.38 | 1:1.27 |
| Sorghum (2) | Varietal evaluation | 80 | 29.00 | 413.14 | 382.69 | 7.85 | 1:3.41 | 1:3.22 |
| | Total | 80 | 29.00 | 413.14 | 382.69 | 7.85 | 1:3.41 | 1:3.22 |
| | Grand Total | 367 | 131.30 | | | | | |



Makhan grass: Demonstrations were undertaken by 1 KVK Rajkot-I at 5 farmers' fields in an area of 2 ha during 2016-17. Farmers optioned towards utility of grass and cultivation of Makhan grass will be continued.

Napier grass: Demonstrations were undertaken by 1 KVK Bharuch on 14 farmers' fields over an area of 2 ha. Napier grass could be undertaken at least three years in the same fields. This fodder is very much useful during summer season for milch animals.

Oat: Demonstrations on oat crop were undertaken by 5KVK (Kutch-II, Vadodara, Gandhinagar, Kheda, Bharuch and Mehsana) at 189 farmers' fields over an area of 69.2 ha. Majority of farmers reported that two cuttings of Oat as fodder could be taken besides grains.

Pearl millet: Demonstrations were undertaken by KVKMehsanaat15 farmers' fields over an area of 1.5 ha. This intervention has been found very effective especially in buffalo.

Sorghum: Demonstrations were undertaken by 2 KVKs Dangs and Mehsana at 80 farmers' fields over an area of 29.00 ha. Farmers reported that more than 413.00 q/ha green fodder productivity was achieved.

9.7 FLDs on Horticultural Crops

Horticulture plays important role in providing nutritional security, income augmentation and sustainable land use system. Arid fruit crops have potential and suitable for different parts of Rajasthan & Gujarat.

FLDs on horticultural crops include fruit crops, vegetables, and flowers. The description about FLDs on these three areas is given separately (Table 10.12 to 10.16).

9.7.1 FLDs on Fruit crops

9.7.1.1 FLDs organized by KVKs of Rajasthan

In Rajasthan, 16 farmers' fields were covered under FLDs on fruit crops on an area of 3 ha in Rajasthan district. (Table 9.12).

From the above table, it can be concluded that papaya cultivation is more profitable, cost effective, affordable and acceptable to farming community. Farmers need to be encouraged towards cultivation of Papaya through organization of Front Line Demonstrations under existing resources of the farmers. Follow up and regular contacts with identified farmers is foremost requirement as papaya is only two or three years duration fruit crop. Based on profitability of papaya cultivation, it can be popularized among other farmers.

| Crops (KVKs) | Theme | No. of | | We | eighted M | BCR | | |
|--------------|---------------------|---------|------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Papaya (2) | Varietal evaluation | 16 | 3.00 | 1306.67 | 900.00 | 41.61 | 1:7.08 | 1:5.22 |
| | Total | 16 | 3.00 | 1306.67 | 900.00 | 41.61 | 1:7.08 | 1:5.22 |
| | Grand Total | 16 | 3.00 | | | | | |

Table 9.12 Performance of FLDs on Fruit Crops in Rajasthan



9.7.1.2 FLDs organized by KVKs of Gujarat

KVKs in Gujarat conducted FLDs on Banana, Guava, Mango, Lime, and Pomegranate. The state covered much more area i.e., 120 ha land under FLDs on 308 farmers' fields (Table 9.13).

Banana: FLDs were undertaken by KVK Surat at 20 farmers' fields over an area of 8ha land on ICM components. An average yield 709.54 q/ha was obtained and farmers opined for adoption of this ICM module in coming years on large scale.

Guava: Guava is important fruit crop after lime of Mehsana district of Gujarat. KVK organized

FLDs on IDM component to reduce disease intensity during 2016-17. farmers obtained 146.49 q/ha yield of guava.

Mango: FLDs on mango were undertaken by 4 KVKs (Dangs, Junagadh, Navsari and Surat) at252farmers' fields over an area of 97ha. The major aspects covered under FLDs were INM, IPM and IDM during 2016-17 at farmers fields. Management of insect-pests in mango recorded highest yield 59.49 q/ha.

Pomegranate: FLDs on pomegranate were undertaken by Mehsana KVK at 12 locations in 5 ha on Integrated Nutrient Management. Farmers

Table 9.13 Performance of FLDs on Fruit Crops in Gujarat

| Crops (KVKs) | Theme | No. of | Area | W | eighted M | ean | BCR | |
|---|-------------|---------|--------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Banana (1) | ICM | 20 | 8.00 | 709.54 | 563.47 | 25.92 | 1:3.90 | 1:3.04 |
| | Total | 20 | 8.00 | 709.54 | 563.47 | 25.92 | 1:3.90 | 1:3.04 |
| Guava (1) (5-6 years old orchard) | IDM | 12 | 5.00 | 146.49 | 118.80 | 23.31 | 1:3.17 | 1:2.82 |
| | Total | 12 | 5.00 | 146.49 | 118.80 | 23.31 | 1:3.17 | 1:2.82 |
| Lime (1) (6 years old orchard) | IDM | 12 | 5.00 | 141.52 | 122.35 | 15.67 | 1:4.01 | 1:3.70 |
| | Total | 12 | 5.00 | 141.52 | 122.35 | 15.67 | 1:4.01 | 1:3.70 |
| Mango(4) (5 years old orchard) | IDM | 42 | 15.00 | 46.61 | 43.67 | 7.34 | 1:2.42 | 1:2.18 |
| | INM | 152 | 62.00 | 61.59 | 55.99 | 9.76 | 1:2.47 | 1:2.26 |
| | IPM | 58 | 20.00 | 62.68 | 57.17 | 9.85 | 1:4.30 | 1:3.76 |
| | Total | 252 | 97.00 | 59.49 | 54.33 | 9.40 | 1:2.72 | 1:2.47 |
| Pomegranate (1) (six years old orchard) | INM | 12 | 5.00 | 101.32 | 92.45 | 9.59 | 1:4.90 | 1:4.56 |
| | Total | 12 | 5.00 | 101.32 | 92.45 | 9.59 | 1:4.90 | 1:4.56 |
| | Grand Total | 308 | 120.00 | | | | | |



obtained 101.3 q/ha fruit yield of pomegranate and also fetched attractive remunerations during 2016-17. Farmers have accepted utility of INM components and large scale application has been initiated in pomegranate on this technology in coming season.

9.7.2 FLDs on Vegetable Crops

9.7.2.1 FLDs organized by KVKs of Rajasthan

Vegetable cultivation provided additional benefit to farmers. In the present scenario of agricultural development, Majority of farmers are eager to cultivate Vegetables. Inclusion of Vegetables under different farming systems is the major vegetables, Cabbage, Carrot, Long and Onion. (Table 9.14)

Cabbage: Ten demonstrations on cabbage were undertaken by KVK Alwar-I at 10 farmers' fields over an area of 2.50 ha. farmers obtained 295 q/ha yield and good remunerative price.

Carrot: FLDs were undertaken by KVK Alwar-I at 10 farmers' fields over at area of 2.50 ha. Farmers received 220.5 q/ha yield within 100 days. An attractive CB ration 1:3.73 was reported by concerned KVK.

Long melon: Demonstrations were undertaken by KVK Banswara at 20 farmers' fields over an area of 4 ha. An average yield 161.60 q/ha was noticed and farmers received good price by selling in the market.

Onion: Demonstrations on onion were undertaken by 2 KVKs (Rajsamand and Banswara) at 20 farmers' fields covering an area of 3.0 ha. Farmers obtained 272.53 q/ha yield within existing resources.

9.7.2.2 FLDs organized by KVKs of Gujarat

KVKs located in Gujarat implemented FLDs on vegetable crops which covered 795 farmers' fields in 224.36ha area. The major vegetables on which FLDs undertaken were

| Crops (KVKs) | Theme | No. of | Area | W | eighted M | ean | BCR | | | | | |
|----------------|---------------------|---------|------|-------------------------|--------------------------|-----------------------------|--------|--------|--|--|--|--|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check | | | | |
| Cabbage (1) | Varietal evaluation | 10 | 2.50 | 295.00 | 244.00 | 20.90 | 1:3.73 | 1:3.34 | | | | |
| | Total | 10 | 2.50 | 295.00 | 244.00 | 20.90 | 1:3.73 | 1:3.34 | | | | |
| Carrot (1) | Varietal evaluation | 10 | 2.50 | 220.50 | 183.00 | 20.49 | 1:3.37 | 1:3.04 | | | | |
| | Total | 10 | 2.50 | 220.50 | 183.00 | 20.49 | 1:3.37 | 1:3.04 | | | | |
| Long Melon (1) | Varietal evaluation | 20 | 4.00 | 161.60 | 123.50 | 30.85 | 1:2.73 | 1:2.22 | | | | |
| | Total | 20 | 4.00 | 161.60 | 123.50 | 30.85 | 1:2.73 | 1:2.22 | | | | |
| Onion (2) | Varietal evaluation | 20 | 3.00 | 272.53 | 222.13 | 22.45 | 1:2.83 | 1:2.42 | | | | |

Table 9.14 Performance of FLD on Vegetable Crops in Rajasthan

3.00

12.00

272.53

222.13

22.45

1:2.83 1:2.42

Total

Grand Total

20

60





FLD on cabbage - KVK Alwar-I

Bitter gourd, Cabbage, Coriander, Cowpea, Cucumber, Indian Bean, Onion, Pigeon pea, Pointed gourd, Tomato, Watermelon (Table 9.15).

Bitter gourd: FLDs on bitter gourd were conducted by KVKValsad at25 farmers' fields in 2.5 ha area. In ICM demonstrations, maximum yield was noticed (216.30 q/ha). An average 15.75% yield enhancement was reported over Farmers practice.

Cabbage: FLDs on cabbage were conducted by KVK kheda at40 farmers' field in 10 ha area. Cabbage is important vegetable crop and its demand is increasing day by day in the daily food habit. In the existing environment, Farmers obtained 207.76 q/ha yield of cabbage. Farmers obtained remuneration more during rainy season.

Coriander: Demonstrations were undertaken by KVK Sabarkanthaat 10 farmers' fields over an area of 1.00. Now farmers realized benefit of

cultivation of coriander. Mainly leaves of coriander are sold by farmers. Maximum 330 q/ha coriander leaves yield was reported with CB ration 1:4.88.

Cowpea: Demonstrations were undertaken by KVK Gandhinagarat 20 farmers' fields over an area of 5 ha. Pods of cowpea have been preferred by farmers. Farmers obtained 131.00 q/ha yield of green pods of cowpea.

Cucumber: Demonstrations were undertaken by KVK Tapi at 10 farmers' fields over an area of 2 ha. Farmers obtained 96.80 q/ha yield in their fields.

Indian bean: Demonstrations were undertaken by 2 KVKs Tapi and Navsariat 101 farmers' fields over an area of 8.6 ha. farmers obtained 16.84 q/ha yield in their fields.

Onion: Demonstrations were undertaken by 5 KVKs (Junagadh, Bhavnagar, Kutch-II, Amreli and Rajkot-I) at48 farmers' fields over an area of



Table 9.15 Performance of FLDs on Vegetable Crops in Gujarat

| Crops (KVKs) | Theme | No. of | Area | W | eighted Me | ean | BCR | | |
|-------------------|---------------------|---------|-------|-------------------------|--------------------------|-----------------------------|--------|--------|--|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check | |
| Bitter gourd (1) | ICM | 25 | 2.50 | 216.30 | 186.80 | 15.75 | 1:1.74 | 1:1.58 | |
| | Total | 25 | 2.50 | 216.30 | 186.80 | 15.75 | 1:1.74 | 1:1.58 | |
| Cabbage (1) | IPM | 40 | 10.00 | 207.76 | 203.80 | 1.94 | 1:3.59 | 1:2.59 | |
| | Total | 40 | 10.00 | 207.76 | 203.80 | 1.94 | 1:3.59 | 1:2.59 | |
| Corainder (1) | ICM | 10 | 1.00 | 330.00 | 317.00 | 4.10 | 1:4.88 | 1:3.72 | |
| | Total | 10 | 1.00 | 330.00 | 317.00 | 4.10 | 1:4.88 | 1:3.72 | |
| Cowpea (1) | INM | 20 | 5.00 | 131.60 | 108.00 | 21.85 | 1:2.19 | 1:1.69 | |
| | Total | 20 | 5.00 | 131.60 | 108.00 | 21.85 | 1:2.19 | 1:1.69 | |
| Cucumber (1) | IPM | 10 | 2.00 | 96.80 | 82.64 | 17.13 | 1:3.63 | 1:2.80 | |
| | Total | 10 | 2.00 | 96.80 | 82.64 | 17.13 | 1:3.63 | 1:2.80 | |
| Indian Bean (2) | Varietal evaluation | 101 | 8.60 | 16.84 | 13.86 | 19.57 | 1:3.14 | 1:2.90 | |
| | Total | 101 | 8.60 | 16.84 | 13.86 | 19.57 | 1:3.14 | 1:2.90 | |
| Onion (5) | IPM | 23 | 7.00 | 290.08 | 261.43 | 11.30 | 1:3.48 | 1:2.84 | |
| | Varietal evaluation | 25 | 10.00 | 301.13 | 280.10 | 7.47 | 1:1.94 | 1:1.88 | |
| | Total | 48 | 17.00 | 296.58 | 272.41 | 9.05 | 1:2.36 | 1:2.17 | |
| Pointed gourd (1) | ICM | 20 | 8.00 | 168.56 | 140.15 | 20.27 | 1:2.56 | 1:2.09 | |
| | Total | 20 | 8.00 | 168.56 | 140.15 | 20.27 | 1:2.56 | 1:2.09 | |
| Pigeon pea (1) | Varietal evaluation | 40 | 4.00 | 72.80 | 62.40 | 16.67 | 1:6.29 | 1:5.63 | |
| | Total | 40 | 4.00 | 72.80 | 62.40 | 16.67 | 1:6.29 | 1:5.63 | |
| Water melon (2) | INM | 29 | 10.00 | 180.50 | 157.90 | 13.64 | 1:3.36 | 1:2.79 | |
| | RCT | 21 | 1.76 | 189.00 | 154.00 | 22.73 | 1:3.49 | 1:3.14 | |
| | Total | 50 | 11.76 | 181.77 | 157.32 | 15.00 | 1:3.38 | 1:2.84 | |
| | Grand Total | 344 | 61.86 | | | | | | |

17.0 ha. Rainy season onion cultivation is gradually increasing and farmers get more profit in comparison to winter onion.

Pointed gourd: Demonstrations were undertaken by KVK Surat, at 20 farmers' fields

over an area of 8.0 ha. A quite good yield potential was realized (168.56 q/ha) and CB ratio was 1:2.56.

Pigeon pea: Demonstrations were undertaken by KVK Dahod at 40 farmers' fields over an



area of 4.0 ha. Vegetable pigeon pea pods yield was 72.8 q/ha and more benefit accrued. Tribal farmers prefer to eat pigeonpea pods as vegetable. They sell green pods of pigeonpea pods in nearby markets. Highest CB ratio has been reported in vegetable pigeonpea in comparison to other vegetable crops.

Water melon: Demonstrations were undertaken by 2 KVKs Tapi and Dangs at 50 farmers' fields over an area of 11.70 ha. Water melon has become popular among tribal farmers.

9.7.3 FLDs on Flower crops

9.7.3.1 FLDs organized by KVKs of Gujarat

A total of 85 demonstrations were conducted at farmers' field in 17 ha in Gujarat. The detail information are given in Table 9.16.

Marigold: Demonstrations were undertaken by KVK Bharuch and Dahod at 35 farmers' fields over an area of 4 ha. Farmers obtained good remuneration from cultivation of Marigold. CB ratio was reported 1:3.17.

Mogra: Demonstrations were undertaken by KVK Ahmedabad at 10 farmers' fields over an area of 5 ha. Farmers obtained good remuneration from cultivation of Mogra and area under flower crop will increase.

Deshi Red Rose: Demonstrations were undertaken by KVK Anand and Dahod on 40 farmers' fields over an area of 8 ha. Farmers viewed that there is good market chain in nearby Anand, Ahmedabad, Vadodara of rose flowers. Thus farmers get benefit from rose cultivation and CB ration is 1:3.81.

9.8 FLDs on Millets

FLDs on millets undertaken by KVKs of Rajasthan and Gujarat during 2016-17 are as under:

9.8.1 FLDs organized by KVKs of Rajasthan

In Rajasthan, 372 farmers' fields were selected to conduct the FLDs at 240.5 ha area. The details are given in table 9.17.

| Crops | Theme | No. of | Area | Wei | BCR | | | |
|--------------|---------------------|---------|-------|--------------------------------|--------------------------|-----------------------------|--------|--------|
| (KVKs) | | farmers | (ha) | Demo yield flower (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Marigold (2) | Varietal Evaluation | 35 | 4.00 | 109.65 | 88.80 | 30.52 | 1:3.17 | 1:2.42 |
| | Total | 35 | 4.00 | 109.65 | 88.80 | 30.52 | 1:3.17 | 1:2.42 |
| Mogra (1) | INM | 10 | 5.00 | 30.00 | 26.50 | 13.50 | 1:3.82 | 1:3.24 |
| | Total | 10 | 5.00 | 30.00 | 26.50 | 13.50 | 1:3.82 | 1:3.24 |
| Rose (2) | INM | 40 | 8.00 | 92.50 | 66.00 | 46.14 | 1:3.81 | 1:2.88 |
| | Total | 40 | 8.00 | 92.50 | 66.00 | 46.14 | 1:3.81 | 1:2.88 |
| | Grand Total | 85 | 17.00 | | | | | |

Table 9.16 Performance of FLD on Flower Crops in Gujarat



| Crops (KVKs) | Theme | No. of | Area | Weighted Mean | | | BCR | |
|------------------|---------------------|---------|--------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Pearlmillet (11) | ICM | 231 | 179.00 | 20.55 | 14.64 | 43.21 | 1:2.71 | 1:2.10 |
| | Varietal evaluation | 116 | 51.50 | 14.96 | 12.81 | 18.41 | 1:2.10 | 1:1.98 |
| | Total | 347 | 230.50 | 19.30 | 14.23 | 37.67 | 1:2.59 | 1:2.07 |
| Sorghum (1) | Varietal evaluation | 25 | 10.00 | 18.11 | 14.14 | 28.08 | 1:2.98 | 1:2.39 |
| | Total | 25 | 10.00 | 18.11 | 14.14 | 28.08 | 1:2.98 | 1:2.39 |
| | Grand Total | 372 | 240.50 | | | | | |

Pearl Millet: Demonstrations were undertaken by 11 KVKs Jodhpur-I, Ajmer, Sikar, Jaipur-II, Pali, Jaipur-I, Dausa, Dholpur, Jodhpur-II, Barmer-I, Hanumangarh-II) at 347 farmers' fields over an area of 179 ha. Pearl millet is important crop of Kharif season in Rajasthan. Farmers obtained 19.30 q/ha yield advantage in the existing resources and prevailing farming situation.

Sorghum: Demonstrations were undertaken by KVK Rajsamand at 25 farmers' fields over an area of 10 ha. Yield advantage (18.11 q/ha) was reported by KVK and this need to be popularized in other parts of the district.

9.8.2 FLDs organized by KVKs of Gujarat

In Gujarat, 156 farmers' fields were chosen to conduct the FLDs at 36.00 ha. The details of FLDs undertaken are given in table 9.18.

Table 9.18 Performance of FLD on Millets in Gujarat

| Crops (KVKs) | (KVKs) Theme | | Area | W | Weighted Mean | | | BCR | |
|------------------|---------------------|---------|-------|-------------------------|--------------------------|-----------------------------|--------|--------|--|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check | |
| Finger millet(2) | Varietal evaluation | 115 | 21.00 | 12.10 | 10.11 | 19.52 | 1:1.87 | 1:1.71 | |
| | Total | 115 | 21.00 | 12.10 | 10.11 | 19.52 | 1:1.87 | 1:1.71 | |
| Little millet(1) | Varietal evaluation | 15 | 5.00 | 10.97 | 9.66 | 13.56 | 1:2.74 | 1:2.63 | |
| | Total | 15 | 5.00 | 10.97 | 9.66 | 13.56 | 1:2.74 | 1:2.63 | |
| Pearlmillet (1) | Varietal Evaluation | 10 | 4.00 | 21.31 | 19.54 | 9.06 | 1:3.28 | 1:2.86 | |
| | Total | 10 | 4.00 | 21.31 | 19.54 | 9.06 | 1:3.28 | 1:2.86 | |
| Sorghum (1) | IPM | 16 | 6.00 | 13.50 | 12.30 | 9.76 | 1:1.93 | 1:1.82 | |
| | Total | 16 | 6.00 | 13.50 | 12.30 | 9.76 | 1:1.93 | 1:1.82 | |
| | Grand Total | 156 | 36.00 | | | | | | |



Finger Millet: FLDs on finger millet was organized by 2 KVKs(Valsad and Dangs) at115 farmers' fields over an area of 21.00 ha during Kharif 2016. Tribal farmers obtained more than 12.00 g/ha yield.

Littlemillet: FLDs on littlemillet were organized by KVK Dangs on 15 farmers' fields over an area of 5.00 ha. Farmers obtained 10.97 q/ha under existing situation (rainfed farming situation).

Pearl Millet: Demonstrations were undertaken by KVK Jamnagar at 10 farmers' fields over an area of 4 ha. Pearl millet is important crop Gujarat. Farmers obtained 21.31 q/ha yield advantage in the existing resources and prevailing farming situations.

Sourghum: FLDs were undertaken by KVK Narmada at 16 farmers' fields over an area of 6 ha. Sourghum being important Kharif coarse cereal crop proved to be more remunerative as farmers obtained 13.5 q/ha yield during 2016.

9.9 FLDs on Spice Crops

Overall, 1247 FLDs on spice crops were undertaken covering an area of 450.2 ha area in during 2016-17. A total of 686 FLDs were undertaken by KVKs of Rajasthan while in Gujarat,561 farmers' fields were selected for demonstration. The area under demonstrations were 243 ha and 207.2 ha, respectively. The details of FLDs are presented in table 9.19 (Rajasthan) and table 9.20 (Gujarat).

Table 9.19 Performance of FLD on Spice Crops in Rajasthan

| Crops (KVKs) | Theme | No. of | Area | W | eighted Mean | | BCR | |
|---------------|---------------------|---------|--------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Coriander (7) | ICM | 82 | 33.50 | 16.39 | 13.69 | 19.71 | 1:3.59 | 1:3.16 |
| | Varietal evaluation | 65 | 28.50 | 13.23 | 11.53 | 15.04 | 1:3.63 | 1:3.43 |
| | Total | 147 | 62.00 | 14.94 | 12.69 | 17.57 | 1:3.61 | 1:3.28 |
| Cumin (7) | ICM | 120 | 52.00 | 7.44 | 6.03 | 24.74 | 1:3.97 | 1:3.41 |
| | Varietal evaluation | 112 | 47.00 | 6.10 | 4.39 | 38.45 | 1:3.47 | 1:2.53 |
| | Total | 232 | 99.00 | 6.81 | 5.25 | 31.25 | 1:3.73 | 1:2.99 |
| Fennel (2) | Varietal evaluation | 78 | 24.00 | 22.55 | 18.06 | 28.29 | 1:5.85 | 1:4.76 |
| | Total | 78 | 24.00 | 22.55 | 18.06 | 28.29 | 1:5.85 | 1:4.76 |
| Fenugreek (5) | ICM | 128 | 41.00 | 17.50 | 12.50 | 40.00 | 1:3.89 | 1:3.13 |
| | Varietal evaluation | 25 | 5.00 | 16.15 | 13.05 | 25.38 | 1:2.15 | 1:1.71 |
| | Total | 153 | 46.00 | 16.30 | 12.99 | 26.96 | 1:2.33 | 1:1.85 |
| Garlic (2) | ICM | 10 | 1.00 | 91.62 | 72.15 | 26.99 | 1:3.16 | 1:2.84 |
| | Varietal evaluation | 66 | 11.00 | 88.82 | 75.33 | 17.91 | 1:4.74 | 1:3.86 |
| | Total | 76 | 12.00 | 89.06 | 75.07 | 18.67 | 1:4.60 | 1:3.77 |
| | Grand Total | 686 | 243.00 | | | | | |

9.9.1 FLDs organized by KVKs of Rajasthan

In Rajasthan, FLDs on spice crops were undertaken on coriander, cumin, fennel and fenugreek crops (Table 9.21).

Coriander: Demonstrations on coriander were conducted by 7 KVKs (Ajmer, Kota, Pratapgarh, Alwar-I, Dholpur, Baran and Bundi) at147 farmers' fields over an area of 62 ha.Coriander cultivation is remunerative and cost effective as majority of farmers obtained average 14.94 q/ha yield during rabi 2016-17.

Cumin: FLDs on cumin were undertaken by 7 KVKs (Jodhpur-I, Ajmer, Pali, Nagour II, Jodhpur-II, Barmer-I and Barmer-II)at 232farmers' fields covering an area of 99.00 ha. Cumin is important seed spice crop of Rajasthan. Demonstrations on wilt resistant varieties are best option to increase productivity as well as total production in Rajasthan.

Fennel: FLDs on fennel were undertaken by 2 KVKs (Bharatpur and Dungarpur) at78 farmers' fields covering an area of 24.00 ha during rabi 2016-17. This another seed spice crop mainly grown in Sandy soils. Farmers obtained 22.55 q/ha yield and highest net profit per unit area with CB ratio 1:5.95.

Fenugreek: FLDs on fenugreek were conducted by 5 KVKs namely Pali, Jhalawar, Pratapgarh, Churu-I and Chittorgarh. Under fenugreek demonstrations, 153 farmers were covered with an area of 46.00 ha. farmers received 17.58 q/ha yield in ICM component followed by 16.15 q/ha in varietal component.

Garlic: FLDs on garlic were conducted by 2 KVKs namely Kota and Baran. Under garlic demonstrations, 76 farmers were covered with

an area of 21.00 ha. Farmers received 91.62 q/ha yield in ICM component followed by 88.82 q/ha in varietal component

9.9.2 FLDs organized by KVKs of Gujarat

In Gujarat, FLDs were conducted on spice crops i.e., Ajawain, Coriander, Cumin, Fennel, Fenugreek, Garlic, Ginger and Turmeric. The details are presented in table 9.20.

Ajawain: Demonstrations were undertaken by 3 KVKs Patan, Kutch-II and Mehsana conducted FLDs at 42 farmers' fields in 14 ha. Ajawain is important spice crop of Gujarat (North). An average yield advantage (10.37 q/ha) was reported during rabi 2016-17.

Coriander: Demonstrations were undertaken by 4 KVKs Kutch-I, Kutch-II, Amreli and Jamnagar conducted FLDs 86 farmers' fields in 34.6 ha. Coriander is important spice crop of Gujarat. An average yield advantage (16.73 q/ha) was reported during rabi 2016-17.

Cumin: Demonstrations were undertaken by 11 KVKs (Jamnagar, Rajkot-I, Surendranagar, Kutch-I, Kutch-II, Patan, Banaskantha-II, Porbandar, Ahmedabad, Amreli and Rajkot-II) at 244 farmers' fields over an area of 104 ha. Cumin is grown in almost important district of Gujarat by exploiting good management. Farmers obtained 9.0 q/ha yield with 4.12 B.C ratio.

Fennel: Demonstrations were undertaken by 5 KVKs (Sabarkantha, Patan, Gandhinagar, Mehsana and Patan) at 108 farmers' fields over an area of 37 ha. Fennel is important seed spice. Farmers obtained 16.53 q/ha yield with 2.86 B.C ratio.



Table 9.20 Performance of FLD on Spice Crops in Gujarat

| Crops (KVKs) | Theme | No. of | Area | W | eighted M | Iean | BCR | |
|---------------|------------------------|---------|--------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Ajawain (3) | Varietal demonstration | 42 | 14.00 | 10.37 | 9.22 | 12.17 | 1:2.78 | 1:2.57 |
| | Total | 42 | 14.00 | 10.37 | 9.22 | 12.17 | 1:2.78 | 1:2.57 |
| Coriander (4) | ICM | 10 | 4.00 | 18.05 | 15.20 | 18.75 | 1:3.51 | 1:2.99 |
| | IDM | 34 | 13.60 | 17.51 | 14.09 | 24.56 | 1:3.25 | 1:2.69 |
| | INM | 12 | 5.00 | 15.35 | 13.32 | 15.24 | 1:2.94 | 1:2.60 |
| | Varietal evaluation | 30 | 12.00 | 15.98 | 14.05 | 13.99 | 1:2.75 | 1:2.25 |
| | Total | 86 | 34.60 | 16.73 | 14.09 | 18.88 | 1:3.02 | 1:2.51 |
| Cumin (11) | ICM | 105 | 47.00 | 10.24 | 8.42 | 23.06 | 1:5.06 | 1:3.82 |
| | IDM | 75 | 30.00 | 7.41 | 6.40 | 16.12 | 1:3.34 | 1:2.55 |
| | INM | 20 | 9.00 | 7.89 | 7.00 | 12.46 | 1:3.85 | 1:3.36 |
| | Varietal evaluation | 44 | 18.00 | 8.99 | 7.36 | 23.60 | 1:3.55 | 1:3.12 |
| | Total | 244 | 104.00 | 9.00 | 7.53 | 20.23 | 1:4.12 | 1:3.27 |
| Fennel (5) | ICM | 5 | 2.00 | 13.25 | 11.10 | 19.37 | 1:2.46 | 1:2.07 |
| | IDM | 20 | 5.00 | 16.50 | 13.70 | 20.44 | 1:3.02 | 1:2.60 |
| | Varietal evaluation | 83 | 30.00 | 16.75 | 14.95 | 12.20 | 1:2.86 | 1:2.57 |
| | Total | 108 | 37.00 | 16.53 | 14.57 | 13.70 | 1:2.86 | 1:2.54 |
| Fenugreek (1) | INM | 12 | 5.00 | 19.35 | 17.65 | 9.63 | 1:1.95 | 1:1.82 |
| | Varietal evaluation | 12 | 5.00 | 16.64 | 15.10 | 10.20 | 1:1.90 | 1:1.76 |
| | Total | 24 | 10.00 | 18.00 | 16.38 | 9.92 | 1:1.93 | 1:1.80 |
| Garlic (1) | Varietal evaluation | 5 | 2.00 | 56.25 | 50.00 | 12.50 | 1:2.52 | 1:2.08 |
| | Total | 5 | 2.00 | 56.25 | 50.00 | 12.50 | 1:2.52 | 1:2.08 |
| Ginger (1) | IDM | 20 | 4.00 | 132.70 | 127.23 | 4.30 | 1:5.76 | 1:5.53 |
| | Total | 20 | 4.00 | 132.70 | 127.23 | 4.30 | 1:5.76 | 1:5.53 |
| Turmeric | Varietal evaluation | 32 | 1.60 | 170.00 | 150.00 | 13.33 | 1:3.81 | 1:3.79 |
| | Total | 32 | 1.60 | 170.00 | 150.00 | 13.33 | 1:3.81 | 1:3.79 |
| | Grand Total | 561 | 207.20 | | | | | |





FLD on fennel KVK Patan

Fenugreek: FLDs on fenugreek were conducted by KVK Mehsana. Under fenugreek demonstrations, 24 farmers were covered with an area of 10.00 ha. farmers received 19.35 q/ha yield in INM component followed by 16.64 q/ha in varietal component.

Garlic: FLDs on garlic were conducted by KVK namely Rajkot-I. Under garlic demonstrations 5 farmers were covered with an area of 2 ha. farmers received 56.25 q/ha in varietal component

Ginger: Demonstrations were undertaken by Dahod KVK at20 farmers' fields over an area of 4 ha. Proven technology of Ginger could be popularized through FLDs per desired level production & augmenting farmers income in tribal area of district.

Turmeric: Demonstrations were undertaken by Dangs KVK at 32 farmers' fields over an area of 1.6 ha. Proven technology of turmeric could be popularized through FLDs per desired level

production & augmenting farmers income in tribal dominating farming population.

9.10 FLDs on Hybrid Crops

The FLDs on hybrid crops were conducted by KVKs on Brinjal, Castor, Cauliflower, Chilly, Cotton, Maize, Napier grass, Okra, Papaya, Pearl millet, Tomato, Bitter gourd, Cabbage and Cucumber. The detail information about yield, area, BC ratio etc., are given in table 9.21 to 9.24.

9.10.1 FLDs organized by KVKs of Rajasthan

In Rajasthan, FLDs were conducted on Brinjal, Castor, Cauliflower, Chilli, Cotton, Maize, Napier grass, Okra, Papaya, Pearlmillet and Tomato. Performances of FLDs in Rajasthan are presented in table 9.21.

Hybrid brinjal: Demonstrations on brinjal were conducted by 2 KVKs (Alwar-I, and Banswara) on 15 locations in 3.5 ha area. Average yield was reported 374.77 q/ha with CB ratio 1:3.91.



Table 9.21 Performance of FLDs on Hybrid Crops (Fruit & Vegetables) in Rajasthan

| Crops (KVKs) | Theme | No. of | Area | W | eighted Mo | ean | BCR | |
|-----------------|---------------------|---------|-------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Brinjal (2) | Varietal evaluation | 15 | 3.50 | 374.77 | 295.94 | 25.83 | 1:3.91 | 1:3.35 |
| | Total | 15 | 3.50 | 374.77 | 295.94 | 25.83 | 1:3.91 | 1:3.35 |
| Cauliflower (1) | Varietal evaluation | 10 | 2.50 | 245.00 | 196.00 | 25.00 | 1:4.00 | 1:3.50 |
| | Total | 10 | 2.50 | 245.00 | 196.00 | 25.00 | 1:4.00 | 1:3.50 |
| Chilli (3) | Varietal evaluation | 40 | 7.50 | 129.53 | 92.66 | 38.88 | 1:4.31 | 1:3.39 |
| | Total | 40 | 7.50 | 129.53 | 92.66 | 38.88 | 1:4.31 | 1:3.39 |
| Okra (1) | Varietal evaluation | 40 | 4.00 | 142.60 | 80.30 | 77.58 | 1:3.79 | 1:2.81 |
| | Total | 40 | 4.00 | 142.60 | 80.30 | 77.58 | 1:3.79 | 1:2.81 |
| Papaya (2) | Varietal evaluation | 16 | 3.00 | 1306.67 | 900.00 | 41.61 | 1:7.08 | 1:5.22 |
| | Total | 16 | 3.00 | 1306.67 | 900.00 | 41.61 | 1:7.08 | 1:5.22 |
| Tomato (4) | Varietal evaluation | 40 | 6.00 | 460.32 | 368.84 | 23.84 | 1:4.00 | 1:3.48 |
| | Total | 40 | 6.00 | 460.32 | 368.84 | 23.84 | 1:4.00 | 1:3.48 |
| | Grand Total | 161 | 26.50 | | | | | |



FLD On Brinjal Pusa Hyb-6 KVK-Alwar-I



Hybrid cauliflower: FLDs on hybrid cauliflower were undertaken by Alwar-I KVK on 10 locations in 2.5 ha land. Majority of farmers opined that cultivation of cauliflower is remunerative and more benefits are obtained during off season (Sept - Oct and May - June).

Chilli: Demonstrations on chilli hybrid were conducted by 3 KVKs i.e., Alwar-I, Udaipur and Banswara on 40 farmers fields covering 7.5 ha land.

Okra: Demonstrations on okra hybrid were conducted by one KVK i.e., Banswara on 40 farmers' fields covering 4.00 ha area. Farmers fetched attractive price due to colour, size and keeping quality of hybrid okra.

Papaya: Demonstrations on Papaya hybrids were conducted by 2 KVKs i.e., Rajsamand and Baran on 16 farmers' fields covering 3.00 ha area. Very good remuneration with CB ratio 1:7.80 was reported.

Tomato: Demonstrations on tomato were conducted by 4 KVKs i.e., Alwar-I, Alwar-II, Bharatpur and Banswara on 40 farmers' fields covering 6.0 ha land. Farmers viewed on quality of hybrid tomato is quite satisfactory and good remunerations were obtained by farmers.

Hybrid castor: FLDs on hybrid castor were undertaken by Sirohi KVK on 40 locations in 16 ha area during kharif season 2016. More than 39 q/ha yield was reported with CB ratio 1:3.35.

Table 9.22 Performance of FLDs on Hybrid Crops (other crops) in Rajasthan

| Crops (KVKs) | Theme | No. of | Area | W | eighted M | ean | BCR | |
|------------------|---------------------|---------|--------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Castor (1) | Varietal evaluation | 40 | 16.00 | 39.20 | 31.20 | 25.64 | 1:3.35 | 1:2.77 |
| | Total | 40 | 16.00 | 39.20 | 31.20 | 25.64 | 1:3.35 | 1:2.77 |
| Cotton (1) | ICM | 40 | 16.00 | 23.41 | 21.01 | 11.36 | 1:3.52 | 1:3.24 |
| | Total | 40 | 16.00 | 23.41 | 21.01 | 11.36 | 1:3.52 | 1:3.24 |
| Maize (3) | ICM | 200 | 80.00 | 40.08 | 30.23 | 39.03 | 1:2.64 | 1:2.22 |
| | Varietal evaluation | 150 | 40.00 | 26.75 | 17.64 | 51.51 | 1:3.34 | 1:2.71 |
| | Total | 350 | 120.00 | 35.64 | 26.03 | 43.19 | 1:2.79 | 1:2.32 |
| Napier grass (1) | ICM | 20 | 5.00 | 204.50 | 149.40 | 36.88 | 1:4.24 | 1:2.86 |
| | Total | 20 | 5.00 | 204.50 | 149.40 | 36.88 | 1:4.24 | 1:2.86 |
| Pearlmillet (11) | ICM | 291 | 119.00 | 20.22 | 15.43 | 33.69 | 1:2.42 | 1:1.96 |
| | Varietal evaluation | 116 | 51.50 | 14.96 | 12.81 | 18.41 | 1:2.10 | 1:1.98 |
| | Total | 407 | 170.50 | 18.63 | 14.64 | 29.07 | 1:2.34 | 1:1.96 |
| | Grand Total | 1018 | 354.00 | | | | | |



Hybrid cotton: FLDs on hybrid cotton was conducted by 1 KVK (Sriganganagar) 40 farmers locations in 16 ha area during 2016-17. Being a commercial crop, farmers received more profit and CB ratio was reported 1:3.52.

Hybrid maize: Demonstrations on hybrid maize were laid out by Pratapgarh, Banswara, and Rajsamand KVKs on 350 locations in 120 ha land. Area under hybrid maize is gradually increasing as farmers told that yield advantage in per unit area is more under hybrid maize in comparison to desi and composite maize cultivation.

Hybrid Napier grass: Demonstrations on napier grass were conducted by KVK Pali on 20 locations in 5 ha land.

Pearl millet: The FLDs on hybrid pearl millet were conducted by 11 KVKs i.e., Jodhpur-I, Ajmer, Sikar, Jaipur-II, Pali, Jaipur-I, Dausa, Dholpur, Jodhpur-II, Barmer-I and Hanumangarh-II on 407 farmers' fields in 170.5 ha area. Hybrid pearlmillet varieties are preferred by farmers as short duration, higher yield, disease resistant, drought tolerant, etc.

9.10.2 FLDs organized by KVKs of Gujarat

In Gujarat, FLDs were conducted on Bittergourd, Brinjal, Cabbage, Castor, Chilly, Cotton, Cucumber, Napier grass, Okra, Paddy, Pearlmillet, Tomato and Watermelon. Achievements of FLDs in Gujarat are presented in table 9.23 and 9.24.

Bitter gourd: Demonstrations on hybrid bitter gourd were conducted by Valsad KVK on 25 farmers' fields covering 2.5 ha. Attractive returns were obtained by participating farmers.

Brinjal: Demonstrations on hybrid brinjal were conducted by KVK-Jamnagar on 5 farmers' fields covering 2 ha. Farmers reported yield level of 593.00 g/ha with CB ratio 1:4.33.

Cabbage: Demonstrations on cabbage were conducted by KVK-Kheda on 40 farmers' fields covering 10 ha during 2016-17. Farmers have shown positive opinion and also assured to increase area under cabbage cultivation in coming season,

Chilli: Demonstrations on hybrid chilli were conducted by 4 KVKs (Vadodara, Patan, Jamnagar and Panchmahal) on 53 farmers' fields covering 14.00 ha. Farmers fetched good remuneration from chilli.

Cucumber: Demonstrations on hybrid cucumber were conducted by KVK-Tapi on 10 farmers' fields covering 2 ha. Potential interventions were accepted by partner farmers.

Okra: Demonstrations on hybrid okra were conducted by 3 KVKs (Surat, Dangs and Tapi) on 136 farmers' fields covering 33 ha. Proven technologies were accepted by partner farmers.

Tomato: Demonstrations on hybrid tomato were conducted by 2 KVK (Anand and Vadodara) on 41 farmers' fields covering 13.00 ha. Farmers obtained 593.00 q/ha tomato sold and more profit was also reported.

Watermion: Demonstrations on watermelon were conducted by 2 KVK (Dangs and Tapi) on 29 farmers' fields covering 10.00 ha. Farmers had positive attitude towards water melon technology demonstrated under FLDs.



Table 9.23 Performance of FLDs on Hybrid Crops (Vegetables and Fruits) in Gujarat

| Crops (KVKs) | Theme | No. of | Area | W | eighted Me | an | BCR | |
|-----------------|---------------------|---------|-------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers | (ha) | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Bittergourd (1) | ICM | 25 | 2.50 | 216.30 | 186.80 | 15.75 | 1:1.74 | 1:1.58 |
| | Total | 25 | 2.50 | 216.30 | 186.80 | 15.75 | 1:1.74 | 1:1.58 |
| Brinjal (1) | IPM | 5 | 2.00 | 593.75 | 542.50 | 9.45 | 1:4.33 | 1:3.55 |
| | Total | 5 | 2.00 | 593.75 | 542.50 | 9.45 | 1:4.33 | 1:3.55 |
| Cabbage (1) | IPM | 40 | 10.00 | 207.76 | 203.80 | 1.94 | 1:3.59 | 1:2.59 |
| | Total | 40 | 10.00 | 207.76 | 203.80 | 1.94 | 1:3.59 | 1:2.59 |
| Chilli (4) | INM | 38 | 10.00 | 236.70 | 220.63 | 7.48 | 1:1.76 | 1:1.63 |
| | IPM | 5 | 2.00 | 143.00 | 128.00 | 11.72 | 1:4.90 | 1:3.97 |
| | Varietal evaluation | 10 | 2.00 | 166.60 | 126.30 | 31.91 | 1:2.76 | 1:2.26 |
| | Total | 53 | 14.00 | 213.30 | 193.92 | 11.57 | 1:2.25 | 1:1.99 |
| Cucumber (1) | IPM | 10 | 2.00 | 96.80 | 82.64 | 17.13 | 1:3.63 | 1:2.80 |
| | Total | 10 | 2.00 | 96.80 | 82.64 | 17.13 | 1:3.63 | 1:2.80 |
| Okra (3) | ICM | 10 | 2.00 | 157.11 | 139.72 | 12.45 | 1:4.09 | 1:3.23 |
| | INM | 94 | 22.00 | 91.02 | 83.32 | 10.64 | 1:3.80 | 1:3.09 |
| | IPM | 32 | 9.00 | 100.40 | 90.50 | 10.86 | 1:2.63 | 1:2.17 |
| | Total | 136 | 33.00 | 97.59 | 88.70 | 10.81 | 1:3.51 | 1:2.84 |
| Tomato (2) | INM | 21 | 5.00 | 314.00 | 270.00 | 16.30 | 1:1.60 | 1:1.35 |
| | IPM | 20 | 8.00 | 563.50 | 504.00 | 11.81 | 1:3.94 | 1:3.62 |
| | Total | 41 | 13.00 | 467.54 | 414.00 | 13.53 | 1:3.06 | 1:2.74 |
| Watermelon (2) | INM | 29 | 10.00 | 180.50 | 157.90 | 13.64 | 1:3.36 | 1:2.79 |
| | Total | 29 | 10.00 | 180.50 | 157.90 | 13.64 | 1:3.36 | 1:2.79 |
| | Grand Total | 334 | 84.50 | | | | | |

Castor: Demonstrations on hybrid castor were conducted by 9 KVKs (Banaskantha-I, Narmada, Banaskantha-II, Gandhinagar, Patan, Junagadh, Ahmedabad, Kutch-II, Anand and Amreli) on 196 farmers' fields covering 84.4 ha. Gujarat is major producer of castor, hence application of proven technologies demonstrated under FLDs will be continued on large scale.

Cotton: Demonstrations on cotton were conducted by 15 KVKs (Banaskantha-I, Sabarkantha, Narmada, Rajkot-I, Junagadh, Porbandar, Anand, Tapi, Jamnagar, Rajkot-II Mehsana, Amreli, Surendranagar, Gandhinagar and Kutch-I) on 343 farmers' fields covering 134.6 ha. Farmers fetched better return under demonstration.



Table 9.24 Performance of FLDs on Hybrid Crops (other crops) in Gujarat

| Crops (KVKs) | Theme | No. of | Area | W | eighted M | lean | BCR | |
|------------------|---------------------|--------------|--------|-------------------------|--------------------------|-----------------------------|--------|--------|
| | | farmers (ha) | | Demo yield (q/ha) | Local check (q/ha) | Increase in yield (%) | Demo | Check |
| Castor (9) | ICM | 45 | 12.00 | 29.98 | 25.81 | 15.73 | 1:3.68 | 1:3.26 |
| | INM | 65 | 25.00 | 28.95 | 21.16 | 35.32 | 1:3.78 | 1:2.96 |
| | IPM | 5 | 10.00 | 20.80 | 19.60 | 6.12 | 1:3.41 | 1:3.28 |
| | Varietal evaluation | 81 | 37.40 | 27.56 | 24.08 | 14.50 | 1:3.97 | 1:3.35 |
| | Total | 196 | 84.40 | 27.51 | 22.93 | 19.85 | 1:3.81 | 1:3.21 |
| Cotton (15) | ICM | 42 | 17.00 | 29.70 | 26.01 | 14.40 | 1:4.75 | 1:4.11 |
| | INM | 101 | 40.40 | 13.69 | 11.75 | 16.86 | 1:2.35 | 1:2.10 |
| | IPM | 142 | 57.00 | 20.44 | 18.11 | 13.14 | 1:3.03 | 1:2.74 |
| | Varietal Evaluation | 58 | 20.20 | 20.26 | 17.98 | 12.37 | 1:2.86 | 1:2.47 |
| | Total | 343 | 134.60 | 19.56 | 17.18 | 14.30 | 1:3.05 | 1:2.72 |
| Napier grass (1) | Varietal Evaluation | 14 | 2.00 | 38.10 | 34.30 | 11.08 | 1:1.59 | 1:1.45 |
| | Total | 14 | 2.00 | 38.10 | 34.30 | 11.08 | 1:1.59 | 1:1.45 |
| Paddy (1) | IPM | 10 | 5.00 | 30.60 | 27.50 | 11.27 | 1:2.15 | 1:2.04 |
| | Total | 10 | 5.00 | 30.60 | 27.50 | 11.27 | 1:2.15 | 1:2.04 |
| Pearlmillet (1) | Varietal Evaluation | 10 | 4.00 | 21.31 | 19.54 | 9.06 | 1:3.28 | 1:2.86 |
| | Total | 10 | 4.00 | 21.31 | 19.54 | 9.06 | 1:3.28 | 1:2.86 |
| | Grand Total | 573 | 230.00 | | | | | |



FLD on Chilli KVK Patan





Installation of Yellow Sticky trap for Pink boll warm in Bt. Cotton KVK Kutch-I

Napier grass: Demonstrations on napier grass were conducted by KVK-Bharuch on 14 farmers' fields covering 2 ha. Good returns were obtained by farmers.

Paddy: Demonstrations on hybrid paddy were conducted by KVK Dangs on 10 farmers' fields covering 5 ha.

Pearlmillet: Demonstrations on hybrid pearlmillet were conducted by 1 KVK (Jamnagar) on 10 farmers' fields covering 4.00 ha. Use of seed of hybrid pearlmillets enhanced productivity and farmers obtained average yield of 21.31 q/ha.

9.11 FLDs on Farm Implements

In the present scenario of agriculture of our country, contribution of farm mechanization technology is well recognized. In the context of Rajasthan and Gujarat states, use of farm implements under different field operations and post harvest processing plays important role in enhancing efficiency and efficacy and reducing drudgery and saving time. There are situation and operation specific implements developed and promoted by research institute, public sectors and private agencies. Krishi vigyan Kendras are also actively involved in promotion of efficacy and suitability of different implements under various farming systems. State wise description of performance of front line demonstrations on farm implements as follows;

9.11.1 FLDs organized by KVKs of Rajasthan

In Rajasthan, KVK Jodhpur, conducted 50 FLDs in 75 ha area on the farm implements mainly on improve Kassi in wheat.

It was reported that 25 per cent time saving under improved Kassi use in harvesting of wheat.

9.11.2 FLDs organized by KVKs of Gujarat

In Gujarat, 70 FLDs were undertaken in 5 ha land on the farm implements. The KVKs



were Gandhinagar and Mehsana. The details about FLDs on the farm implements are given in table 9.25.

9.12 Performance of FLDs on Vermi-Compost

Total 30 FLDs were conducted by KVKs of Rajasthan and Gujarat. KVK Jhalawar and Mehsana undertaken FLDs on vermicomposting production on 30 units shows 14.62% higher production of vermi compost. The details are given in Table 9.26.

9.13 FLDs on Livestock

9.13.1 FLDs organized by KVKs of Rajasthan

In Rajasthan, KVK, Ajmer, Dausa, Hanumangarh-I, Kota, Nagaur-I and Udaipur organized FLDs on livestock on 941 units in 935 farmers' livestock (Table 9.28).

FLD on cow was conducted by KVK Ajmer on application of UMMB on 66 units and mineral mixture supplementation on 42 units for improving milk production. The milk yield under UMMB and mineral mixture demo

Table 9.25 Performance of FLD on Farm Implements

| District | Name of the implement | Crop | Technology demonstrated | No. of Farmer | Area (ha) | Major parameters | Filed observation (output/man hour) | Local check | % change in major parameter |
|-------------|---------------------------------|-----------------------|--|------------------|--------------|-----------------------------------|--|----------------|-----------------------------------|
| Gandhinagar | Seed cum fertilizer drill | Wheat | Sowing Implements | 10 | 5.00 | Saving of seed and uniform sowing | 38.4 | 33.8 | 13.61% |
| Mehsana | Wheel hoe | Wheel hoe | Interculturing and weed management | 10 | 4.00 | Field Capacity (ha/hr) | 30 | 46 | 34.78% |
| Mehsana | Power weeder | Cotton | Interculturing and weed management | 10 | 3.00 | Field Capacity (ha/hr) | 291 | 316.5 | 8.06% |
| Mehsana | Zero Seed Drill | Zero Seed Drill | Sowing Implements | 10 | 5.00 | Land preparation and sowing | 38.95 | 38.67 | 0.72% |
| Mehsana | Fruits grader | Lime | Post harvest technology | 10 | 2.00 | Field Capacity (ha/hr) | 0.38 | 0.93 | 59.14% |
| Mehsana | Naveen dibbler | Castor | Durgey reduction | 10 | 4.00 | Man hr. | 2.32 | 2.08 | 11.54% |
| Mehsana | Serrated sickle | Sesame | Use of Power weeder for interculturing | 10 | 5.00 | Man hr. | 16 | 18 | 11.11% |
| | | | Total | 70 | 28.00 | | | | |

7.44

6.32

17.72

Mehsana Vermicompost

Total



Gujarat

| State | District | Technology demonstrated | | Units | Performance parameters / | Production q | change | |
|-----------|----------|-------------------------|------------|-------|-----------------------------|---------------|--------|---------------|
| | | | of Demo | | indicators | Demonstration | Check | milk yield |
| Rajasthan | Jhalawar | Vermicompost | 20 | 20 | Production of vermi-compost | 8.32 | 7.46 | 11.53 |

Production of vermi-compost

10

30

10

30

Table 9.26 Performance of FLDs on Vermi-Compost

was recorded, 6.67 lit/ day and 7.21 lit/day respectively; while in check it was 6.03 and 6.65 lit/day. Hence, 10.61 and 8.42% milk yield was enhanced through the intervention of the urea mineral molasses block (UMMB) and mineral mixture supplementation, respectively.

Dausa KVK conducted FLDs in 36 units on effect of balanced concentrate mixture in milk yield of buffaloes. The milk production under demonstration was recorded 7.013 litre/day while in check, it was 6.361 litre/day. Overall, 10.24% increase in milk production was observed due to feeding of balanced concentrate mixture.

Frontline demonstrations were conducted by KVK Hanumangarh-I on azolla fern feeding to increase milk yield of dairy cattle on 20 units. The milk yield under demo was recorded 6.05 litres/day, however, in check it was 5.58 litres/day. Hence, 8.50% milk was enhanced through the intervention of azolla fern feeding to dairy cattle. Further it was also observed that food intake increased especially in cow by use of this feed ingredient.

Similarly, FLD was conducted on 4.0% urea treated straw to dairy cattle on 11 units. It was observed that milk yield under demo was recorded 7.986 litre/day, however, in check it

was 7.623 litre/day. Therefore, 3.58% milk yield was enhanced through the intervention of urea treated straw fed to dairy cattle. In another FLD on indigenous cattle feeding UMMB on 10 units was also conducted. The milk production under demo was 6.75 litres/day, while, in check it was found 6.16 litres/day. Hence, 8.93% milk yield was increased through the intervention of urea mineral molasses block (UMMB).

KVK Kota conducted FLDs on 706 indigenous cows to demonstrate the impact of special feeding during last 2 month of pregnancy. The average milk yield under demo was 6.5 litres/day, however, in check it was 3.5 litres/day. Hence, 85.0% milk yield was enhanced through the intervention of special feeding during last 2 month of pregnancy.

Nagaur-I KVK conducted FLDs in 45 units on effect of balanced concentrate mixture in milk yield of buffaloes. The milk yield under demonstration was recorded 6.83 litre/day; while in check, it was 6.28 litre/day. Overall, 8.66% increase in milk yield was observed due to feeding of balanced concentrate mixture to milking buffaloes in Nagaur district.

FLD on Manger construction was conducted by KVK Udaipur on 5 units. It was observed that under demo group of 4 animals

Table 9.27 Performance of FLD on livestock

| Category | Thematic area | Name of the | No. of | No.of Units | Major pa | arameters | % |
|-----------------------|----------------------------------|---|--------|-------------------------------------|---------------------------------|---------------------------------|---------------------------------|
| | | technology demonstrated | Farmer | (Animal/ Poultry/ Birds, etc) | Demo | Check | change in major parameter |
| Ajmer | | | | | | | |
| Cattle | Feed Management | Use of UMMB in milch animal ration | 66 | 66 | 6.67 milk lit./ day | 6.03 milk lit./ day | 10.61 |
| Cattle | Feed Management | Use of mineral mixture in milch animal ration | 42 | 42 | 7.21 milk lit./ day | 6.65 milk lit./ day | 8.42 |
| Dausa | | | | | | | |
| Buffalo | Feed management | Mineral mixture | 36 | 36 | 7.013 milk lit./ day | 6.361 milk lit./ day | 10.24 |
| Hanumangarh-I | | | | | | | |
| Cattle | Feed management | Effect of feeding Azola fern on milk yield of animals | 20 | 20 | 6.05 milk lit./ day | 5.58 milk lit./ day | 8.5 |
| Cattle | Feed Management | Urea treatment (NIFTD) | 11 | 11 | 7.896 milk lit./ day | 7.623 milk lit./ day | 3.58 |
| Cattle | Feed management | Popularization of urea molasses block feeding | 10 | 10 | 6.75 milk lit./ day | 6.16 milk lit./ day | 8.93 |
| Kota | | | | | | | |
| Cattle Indigenous cow | Feed mgt | Special feeding during last 2 month of pregnancy | 700 | 706 | 6.5 milk lit./ day | 3.5 milk lit./ day | 85 |
| Nagaur-I | | | | | | | |
| Buffalo | Feed Management | Mineral Mixture | 25 | 25 | 6.83 milk lit./ day | 6.28 milk lit./ day | 8.66 |
| Buffalo | Feed Management | Mineral Mixture | 20 | 20 | 6.77 milk lit./ day | 6.22 milk lit./ day | 8.76 |
| Udaipur | | | | | | | |
| Cattle | Feed and Fodder Technology | Manger Construction | 5 | 20 | 19.2 kg/day for 4 animals | 24.0 kg/day for 4 animals | 20.0% fodder saved. |



saved 19.2 kg/day fodder wastage, while, in check it was 24.0 kg/day by a group of 4 animals. Hence, 20.0% fodder wastage was saved due to construction of feed manger provided to dairy cattle.

9.13.2 FLDs organized by KVKs of Gujarat

In Gujarat, FLDs on the livestock were conducted on 1134 units related to 961 farmers. The theme wise information about FLDs is given in table 9.28. Total 14 KVKs conducted FLDs on various aspect of livestock feeding, breeding, health and management on cattle and buffalo. Under mineral mixture supplementation 7 KVKs (Bharuch, Gandhinagar, Junagadh, Mehsana, Porbandar, Surat, Vadodra) organized FLDs; while on chelated mineral mixture only three KVKs i.e. Anand, Navsari and Rajkot-I conducted FLDs. Under balanced feeding 3 KVKs (Mehsana and Navsari) conducted FLDs on urea treated straw provided to dairy cattle for improving milk production. To improve the health and diseases for clean milk production 7 KVKs (Ahmedabad, Anand, Mehsana, Bharuch, Dahod, Kutch-I and Mehsana), respectively conducted FLDs on cattle and buffaloes.

FLDs on improving milk production through deworming and disinfection in buffaloes was conducted by KVK Ahmedabad on 10 units. Results showed 7.0 lit/day milk yield under demo and 6.80 lit/day under local check. Hence, an increase of 6.8% in milk yield was recorded due to deworming and disinfection intervention in buffaloes.

KVK Anand conducted FLDs to show the effect of technologies on buffaloes. The demonstrated technologies were use of Anubhav

Chelated mineral mixture and deworming bolus and Deltamethrin, respectively on 10 and 20 units. The increased milk yield in buffaloes was registered as 13.3% and 12.0%, respectively over local check. Daily milk yield recorded under demo was 6.80 lit/day and 5.60 lit/day, respectively in buffaloes; while under local check it was 6.00 lit/day and 5.00 lit/day, respectively.

Bharuch KVK conducted FLDs to demonstrate the effect of cattle mineral mixture, deworming bolus and ecto-parasites, respectively on 100, 50 and 50 units. The increased milk yield in cattle was registered as 9.92%. 6.99% and 6.80%, respectively over local check. Daily milk yield recorded under these demo, respectively was 6.25, 3.75 and 5.39 lit/day, respectively in cattle; while under local check it was 6.00 lit/day and 5.00 lit/day, respectively.

KVK Dahod conducted FLD on use of probiotic for improving growth of calves on 15 units. It was observed that the growth of under probiotic intervention recorded 31.19% higher body weight as compared to calves under control group (126.17 kg vs 95.67 kg) during the study period. FLDs improving milk production through deworming and disinfection in buffaloes was also conducted on 50 units. Results showed 6.29 lit/day milk yield under demo and 5.55 lit/day under local check. Hence, an increase of 13.46% in milk yield was recorded due to deworming and disinfection intervention in buffaloes.

Gandhinagar KVK conducted FLDs on chelated mineral mixture and bypass fat to lactating cattle for improving milk yield in dairy



Table 9.28 Performance of FLD on livestock

| Category | Thematic | Name of the | No. of | No. of | Major par | rameters | % |
|--------------|-------------------------------------|---|--------|--|-------------------------|-------------------------|----------------------------------|
| | area | technology demonstrated | Farmer | Units (Animal/ Poultry/ Birds, etc) | Demo | Check | change in major milk yield |
| Ahmedabad | | | | | | | |
| Buffalo | Health and Disease management | Deworming tablet | 10 | 10 | 7.0 milk lit./ day | 4.8 milk lit./ day | 6.8 |
| Anand | | | | | | | |
| Buffalo | Feed supplement | Use of Anubhav Chelated mineral mixture | 10 | 10 | 6.8 milk lit./ day | 6.0 milk lit./ day | 13.33 |
| Buffalo | Disease Management | Deworming bolus and Deltamethrin | 20 | 20 | 5.6 milk lit./ day | 5.0 milk lit./ day | 12.00 |
| Bharuch | | | | | | | |
| Cow | Animal Nutrition | Mineral Mixture | 100 | 100 | 6.87 milk lit./ day | 6.25 milk lit./ day | 9.92 |
| Cow | Health Management | Dewormer | 50 | 50 | 3.93 milk lit./ day | 2.75 milk lit./ day | 6.99 |
| Cow | Health Management | Ectoparasite eradication | 50 | 256 | 5.39 milk lit./ day | 5 milk lit./ day | 7.80 |
| Dahod | | | | | | | |
| Calf | Health Management | Pro-biotic | 15 | 15 | Body weight 126.17 | Body weight 95.67 | 31.19 |
| Buffalo/ Cow | Dairy management | Deworming & Disinfestations | 50 | 50 | 6.29 milk lit./ day | 5.55 milk lit./ day | 13.46 |
| Gandhinagar | | | | | | | |
| Cattle | Nutritional Mgmt. | Mineral Mixture | 20 | 20 | 11.97 milk lit./ day | 9.56 milk lit./ day | 7.98 |
| Cattle | Nutritional Mgmt. | Bypass Fat | 20 | 20 | 9.30 milk lit./ day | 8.78 milk lit./ day | 5.9 |
| Junagarh | | | | | | | |
| Buffalo | Animal nutrition management | Effect of supplementing mineral mixture @ 40gm/ animal/ day on milk yield in buffalo | 15 | 15 | 10.03 milk lit./ day | 9.35 milk lit./ day | 7.27 |



| Category | Thematic | Name of the | No. of | No. of | Major par | rameters | % |
|-----------|-----------------------------------|--|--------|--|---------------------------|---------------------------------|----------------------------------|
| | area | technology demonstrated | Farmer | Units (Animal/ Poultry/ Birds, etc) | Demo | Check | change in major milk yield |
| Kutch-I | | | | | | | |
| Cows | Feed & Fodder Tech. | Ensilage Process | 5 | 5 | 9.20 milk lit./ day | 8.50 milk lit./ day | 8.23 |
| Cows | Disease Mangt | Control of Endo & Ecto Parasites | 15 | 15 | 6.60 milk lit./ day | 5.90 milk lit./ day | 11.18 |
| Mehsana | | | | | | | |
| Cattle | Disease Management | Potassium Permanganate | 20 | 20 | 8.1 milk lit./ day | 6.9 milk lit./ day | 2.53 |
| Buffalo | Nutrient management | Mineral mixture(Sagar booster plus) | 10 | 10 | 20 milk lit./ day | 17 milk lit./ day | 17.65 |
| Buffalo | Value addition | Urea Treatment on Wheat Straw | 20 | 20 | 8.4 milk lit./ day | 7.7 milk lit./ day | 9.09 |
| Buffalo | Disease Management | Fenbendazole | 20 | 20 | 8.6 milk lit./ day | 7.8 milk lit./ day | 10.26 |
| Navsari | | | | | | | |
| Cattle | Animal Nutrition Management | Urea treatment of paddy straw | 316 | 316 | 12.4 milk lit./ day | 11.39 milk lit./ day | 8.87 |
| Cattle | Animal Nutrition Management | Use of bypass fat during transition period | 20 | 20 | 8.7 milk lit./ day | 7.95 milk lit./ day | 9.43 |
| Cattle | Animal Nutrition Management | Use of chelated minerals and vitamins | 20 | 20 | 11.05 milk lit./ day | 10.20 milk lit./ day | 8.33 |
| Porbandar | | | | | | | |
| Buffalo | Animal Nutrition Management | Mineral Mixture | 50 | 50 | 2600 milk lit./lactation | 2150 milk lit./ lactation | 20.93 |
| Rajkot-I | | | | | | | |
| Buffalo | Nutrient Manage- ment | Chelated mineral mixture power | 20 | 1 | 1550 milk lit./lactation | 1475 milk lit./ lactation | 5.08 |
| Buffalo | Nutrient Manage- ment | By Pass protein | 10 | 1 | 1646 milk lit./ lactation | 1541 milk lit./ lactation | 6.81 |
| Buffalo | Fodder Management | Makhan grass | 5 | 1 | 693 milk lit./ lactation | 650 milk lit./ lactation | 6.62 |



| Category | Thematic | Name of the | No. of | No. of | Major par | rameters | % |
|-----------|-------------------------|--|--------|--|---------------------------|---------------------------------|----------------------------------|
| | area | technology demonstrated | Farmer | Units (Animal/ Poultry/ Birds, etc) | Demo | Check | change in major milk yield |
| Rajkot-II | | | | | | | |
| Cattle | Nutrition management | Calcium Supplements | 10 | 10 | 1795 milk lit./ lactation | 1690 milk lit./ lactation | 6.21 |
| Surat | | | | | | | |
| Cow | Nutrition Management | Mineral Mixture 40 mg per Day and De-worming 3 g Tablet | 20 | 20 | 8.78 milk lit./ day | 7.8 milk lit./ day | 12.5 |
| Tapi | | | | | | | |
| Buffalo | Nutrition management | Bypass fat @ 50 gm /day for 120 days (Oral route) | 20 | 20 | 8.4 milk lit./ day | 7.1 milk lit./ day | 15.47 |
| Vadodara | | | | | | | |
| Buffalo | Ani. Nutrition | Mineral Mixture+ Common Salt | 20 | 20 | 6.71 milk lit./ day | 5.92 milk lit./ day | 13.34 |
| Total | | | 961 | 1134 | | | |

cattle respectively on 20 units each. Results showed milk yield of 11.97 and 9.30lit/day under demo and 11.56 and 8.78lit/day under local check was recorded. Hence, an increase of 7.98 and 5.9% in milk yield was registered due to mineral mixture and bypass fat provided to lactating cattle.

KVK Junagadh conducted FLDs to show the effect of proven technologies on buffaloes. The demonstrated technology was feeding of concentrate mixture @ 40g/day/ animal on 15 units. The increased milk yield in buffaloes was registered as 7.27% over local check. Daily milk yield recorded under demo was 10.3 lit/day; while under local check it was 9.35 lit/day. A

little increase of 6.0 % in fat was also observed under the demo unit (7.35% fat) due to supplementation of concentrate mixture @ 40 g/day/ animal.

FLDs were conducted by KVK Kutch-I on fodder ensiling and control of ecto and endo parasites for improving milk production and health of dairy cattle, respectively on 5 and 15 units. Results showed increase in milk yield of 9.20 and 6.60 lit/day respectively under demonstration and 8.50 and 5.90 lit/day under local check. Hence, an increase of 8.23 and 11.18.% in milk yield was registered due to fodder ensiling and control of ecto and endo parasites of lactating cattle.



KVK Mehsana demonstrated urea treatment technique, KMnO4 for teat dipping, mineral; mixture, urea treated straw and fenbendazole for deworming, respectively on 20, 10, 10 and 20 units in cattle and buffaloes. Data analysis on milk production indicated 8.5, 17.65, 9.09 and 10.26% higher milk yield under all the four demos (8.10, 20.00, 8.40 and 8.60 lit/day) than local check (7.90, 17.0, 7.70 and 7.80litre/day), respectively. Further it was also observed that buffaloes' teat dipped in KMnO4 effectively controlled the mastitis disease.

Navsari KVK conducted FLDs on cows to notice the results of urea treated straw, use of bypass fat and chelated mineral mixture, respectively on 316, 20 and 20 cows. Data analysis on milk increase indicated 8.87, 9.43 and 8.33% higher milk yield under all the three demos (12.4, 8.70 and 11.05 litre/day) than local check (11.39, 7.95 and 10.20.48 litre/day), respectively. It was noticed that balanced feeding with urea treated straw, bypass fat and chelated mineral mixture supplementation had a significant improvement in milk yield and overall health status of lactating dairy cattle.

Fifty FLDs were conducted on buffaloes about feeding of mineral mixture by KVK Porbandar. The results of mineral mixture supplementation showed 20.93% higher milk production under demonstrated buffaloes (2600lit/ lactation) as compared to local check (2150lit/ lactation), which clearly indicated significance of mineral mixture feeding to lactating buffaloes.

KVK Rajkot-I conducted FLDs on buffaloes about feeding of chelated mineral mixture, bypass protein and Makhna grass, respectively on 20, 10 and 5 units. The results showed 5.08, 6.81 and 6.62% higher milk yield under demonstrated trial (1550, 1646 and 693 lit/ lactation) as compared to local check (1475, 1541 and 650 lit/ lactation), respectively. It was also observed that buffaloes fed chelated minerals mixture, bypass protein and Makhan grass had better health and exhibited regular estrus symptoms.

KVK Pipalia (Rajkot-II) conducted FLDs in 10 units each on cattle by using feed additives i.e. calcium supplement. Data analysis on milk production indicated 6.21% higher milk production under demos (1795lit/lactation) than local check (1690lit/lactation). In addition to it was also observed that supplementation of calcium feeding in cow had better health and exhibited regular estrus symptoms as well.

Twenty FLDs were conducted by Surat KVK on cows to mitigate mineral deficiency through mineral mixture and 3.0g tablet (Albendazole) for deworming. Results indicated 12.5% higher milk yield (8.78litre/day) than local cattle (7.80 litre/day). There was a reduction of 30% in service period of cow under demo (105 days) over local check (150 days). It clearly showed that mineral deficiency could be mitigated significantly through mineral mixture supplement along-with deworming tablet.

FLDs on feeding bypass fat (@ 50gm/day for 120days through oral route) was conducted on 20 units of buffaloes by KVK Tapi. The results of feeding bypass fat to dairy buffaloes showed 15.47% increase in milk yield under demo unit (8.40lit/day) as compared to local check (7.10lit/day).



Vadodra KVK conducted FLDs on mitigation of mineral deficiency in buffaloes through balanced feeding (mineral mixture) in 20 units. The milk yield under demo was 6.71 litre/day as compared to check (5.92 litre/day). Hence, an increase of 13.34% milk per day was recorded due to mineral mixture supplementation and overall health of buffaloes was also improved.

9.13.3 FLDs on Fisheries

Total 272 FLDs were conducted on fisheries which covered an area of 37.33 ha in

both the states of Rajasthan and Gujarat. KVK Hanumangarh-I conducted 10 FLDs on popularizing composite fish culture in water storage tank at 10 farmers' fish ponds. Under demonstration 880 kg/unit (100'x100'x10') fish production was recorded, however, there was not control group in these demonstrations for comparison with demo unit. Anand KVK conducted 3 FLDs on feed management using supplementary fish feed in 3.0ha area. Under demonstration 48.37 percent more fish was harvested as compared to local check (4145 vs 2797 kg/unit).

| Category | Thematic | Name of the | No. of | | Major parai | neters | % change | Surviva | al (%) |
|------------------------|------------------------|--|--------|------|--|-------------------------------------|-----------------------|---------------|--------|
| | area | technology demonstrated | Farmer | (ha) | Demons ration | Check | in major parameter | Demons ration | Check |
| 1.Hanumangarh-I | | | | | | | | | |
| Common Carps | Composite fish culture | Popularise fish culture in water storage tank | 10 | 10 | 8.80 | - | - | | |
| 2.Anand | | | | | | | | | |
| Feed Management | Feed management | Use of supplementary feed | 3 | 3 | 41.54 | 27.97 | 48.37 | | |
| 3.Navsari | | | | | | | | | |
| Common Carps | Aquaculture | Fish seed stocking density and species ratio | 90 | 8.33 | 2596 | 1644 | 57.91 | 78 | 58 |
| Common Carps | Aquaculture | Fish seed rearing | 15 | 1 | 32000 numbers yearling production/0.75 ha | 12000 yearlings per ha | 166.67 | 22 | 8 |
| Composite fish culture | Aquaculture | Composite fish culture | 25 | 4 | 2600 kg fish + 400 Kg prawn | 1700 Kg fish +150 Kg prawn | 52.94 | 70 | 60 |
| Feed Management | Aquaculture | Fish nutrition and feeding rate | 129 | 11 | 2460 | 1644 | 49.64 | 76 | 58 |



KVK Navsari conducted FLDs 90, 15, 25 and 129 on fish seed stocking, fish seed rearing, composite fish culture and fish nutrition, and feeding rate, respectively covering an area of 8.11, 1.0, 4.0 and 11.0ha. Mainly calta, rohu, mringal and grass carp fish were used in these FLDs at farmers' fish ponds. The results showed that fish production under demo units of seed stocking density and nutrition was 25.96 and 24.60q/ha, respectively over local check (16.44q/ha in both). Hence, an increase of 57.91 and 49.64% was, respectively recorded under demo units as compared to farmer's practice. In addition to these fish seed rearing (fry to fingerlings) 78 per cent higher survival rate was recorded under demo unit (58%) over local check (18%).

The results of demo under fish seed rearing and composite fish culture recorded 32000 fingerlings/ha and 200kg fish +400 kg Prwan, respectively over local check (12000 fingerlings/ha and 170 0kg fish +150 kg Prwan). Thus, a net increase of 166.67 and 52.94 percent was noticed in fingerlings and prawn production, respectively. Survival percent rate was recorded 22 and 70, respectively under seed rearing and composite fish culture demonstrations as compared to local check i.e. 8 and 60 percent, respectively. Based on the results fisheries is recommended to be adopted in Gujarat state as highly profitable enterprise through which farmers can earn their sustainable livelihood and can provide employment to several unemployed rural youths.





TRAINING ACHIEVEMENTS

The Krishi Vigyan Kendra (KVK) is an innovative science based Farmer Centric based Centre which is actively involved in imparting need based training to farmers, farm women and providing gainful employment to rural youth by organization of vocational training courses of long duration (one month to six months). To provide latest technical know-how on regular basis indifferent areas related to agriculture, inservice training courses are organized for extension personnel/workers of the concerned district.

The KVKs of Rajasthan and Gujarat organized a total number of 4515 training courses were imparted for 414354 farmers, rural youth and extension functionaries, out of which 4114courses were organized for 128646 practicing farmers/ farm women. The participation of scheduled castes/tribes and farm women was reported as 34.81 per cent (49206) and 26.92 per cent (38048), respectively. The training courses conducted for the rural youth and extension functionaries were 229 and 172 through which 7040 rural youth 5668 extension functionaries, respectively, took part. These training programmes were conducted both 'on campus' and 'off campus' as per the convenience of participants and nature of training programmes. The state wise details of trainings on different thematic areas are depicted in Table 10.1 to 10.15.

Farmers and farm women

KVKs of this zone conducted a total number of 4969 training programmes in which152848 farmers and farm women took part. The state wise training programmes for Rajasthan and Gujarat comprised 2694 & 2275 courses and 76885 & 75963 participants, respectively Table 10.1)

Out of the total 36.76% (28266) and 38.54% (29279) trainees belonging to scheduled caste and scheduled tribes in Rajasthan and Gujarat, respectively. The highest number of training programmes were conducted in the area of Crop Production (1129) followed by Home Science (815), Horticulture (734), Livestock



ON campus training, KVK, Jamnagar

| Table 10.1 | Farmers and | l farm wome | n training ind | cluding sponsored |
|-------------------|-------------|-------------|----------------|-------------------|

| Area of Training | | Raja | sthan | | | Gu | jarat | | Grand Total | | | |
|-------------------------------------|------|-------|-------|-------|------|-------|-------|-------|-------------|-------|-------|--------|
| | C | M | F | T | C | M | F | T | C | M | F | T |
| Crop production | 701 | 17579 | 2786 | 20365 | 369 | 11014 | 1863 | 12877 | 1070 | 28593 | 4649 | 33242 |
| Horticulture | 362 | 9229 | 1381 | 10610 | 266 | 7203 | 1902 | 9105 | 628 | 16432 | 3283 | 19715 |
| Soil health & fertility management | 131 | 3272 | 564 | 3836 | 90 | 3151 | 223 | 3374 | 221 | 6423 | 787 | 7210 |
| Livestock production and management | 397 | 7816 | 2970 | 10786 | 264 | 4765 | 3756 | 8521 | 661 | 12581 | 6726 | 19307 |
| Home science/ women empowerment | 207 | 857 | 5299 | 6156 | 236 | 271 | 7414 | 7685 | 443 | 1128 | 12713 | 13841 |
| Agril. Engineering | 33 | 785 | 36 | 821 | 117 | 3094 | 688 | 3782 | 150 | 3879 | 724 | 4603 |
| Plant protection | 241 | 5971 | 900 | 6871 | 310 | 9678 | 1143 | 10821 | 551 | 15649 | 2043 | 17692 |
| Fisheries | 4 | 97 | 4 | 101 | 41 | 960 | 338 | 1298 | 45 | 1057 | 342 | 1399 |
| Production of input at site | 26 | 557 | 114 | 671 | 15 | 550 | 76 | 626 | 41 | 1107 | 190 | 1297 |
| Capacity building & group dynamics | 197 | 4565 | 1846 | 6411 | 94 | 2480 | 1148 | 3628 | 291 | 7045 | 2994 | 10039 |
| Agro forestry | 13 | 287 | 14 | 301 | 0 | 0 | 0 | 0 | 13 | 287 | 14 | 301 |
| Total | 2312 | 51015 | 15914 | 66929 | 1802 | 43166 | 18551 | 61717 | 4114 | 94181 | 34465 | 128646 |

C: No. of Course, M: Male, F: Female; T: Total

Production and Management (724), plant protection (667), Capacity Building & Group Dynamics (335), Soil Health & Fertility Management (273), agricultural engineering (149), Fisheries (68), Production of Inputs at Site (47) and agro forestry (28) with the participation of 36089, 22807, 22434, 21167, 21062, 11526, 8814, 4644, 2054, 1433 and 818 farmers / farm women, respectively.

Crop Production

Under crop production, a total number of 1070 courses were organized by KVKs of Rajasthan (701) and Gujarat (369) benefiting 33242 participants. The highest number of training programmes were conducted on weed management (337), crop diversification(117),



On campus Training programme on green gram cultivation KVK Jhunjhunu



micro irrigation (97), integrated farming (91), resource conservation technologies (90), cropping systems (76), soil & water conservation (55), integrated crop management (47), integrated nutrient management (43), production of organic inputes (43), seed production (38), nursery management (23) and others (7) involving 10472, 3134, 2998, 2717, 2862, 2589, 1740, 1455, 1321, 1588, 1184, 922 and 260 farmers, respectively. The state wise details are presented in Table 10.2.

Horticulture

KVKs of the zone organized 628 training programmes in which 19715 farmers/farm women took part. Various aspects were covered under the training programmes viz. vegetable

crops (297), fruit production (215), ornamental plants (15), plantation crops (14), tuber crops (9), spices (69) and medicinal & aromatic plants (9), involving 8691, 6110, 393, 398, 319, 2595and 439 participants, respectively. The state wise details of specific courses and participants are given in Table 10.3.

Soil Health and Fertility Management

A total number of 156 training programmes were organized by KVKs for 8814 farmers and farm women. The major areas on which training programmes conducted were soil fertility management (46), integrated water management (11), integrated nutrient management (43), production and use of organic inputs (31), management of problematic soils

Table 10.2 Training on Crops Production including sponsored

| Area of Training | Raj | asthan | Gu | ijarat | Grai | nd Total |
|------------------------------------|-----|--------|-----|--------|------|----------|
| | C | P | C | P | C | P |
| Weed Management | 221 | 6428 | 116 | 4044 | 337 | 10472 |
| Resource Conservation Technologies | 55 | 1576 | 35 | 1286 | 90 | 2862 |
| Cropping Systems | 57 | 1974 | 19 | 615 | 76 | 2589 |
| Crop Diversification | 81 | 2014 | 36 | 1120 | 117 | 3134 |
| Integrated Farming model | 73 | 2160 | 18 | 557 | 91 | 2717 |
| Micro Irrigation/irrigation system | 63 | 1657 | 34 | 1341 | 97 | 2998 |
| Seed production technology | 22 | 586 | 16 | 598 | 38 | 1184 |
| Nursery management | 19 | 540 | 10 | 382 | 29 | 922 |
| Integrated Crop Management | 28 | 771 | 19 | 684 | 47 | 1455 |
| Soil & water conservatioin | 22 | 640 | 33 | 1100 | 55 | 1740 |
| Integrated nutrient management | 28 | 812 | 15 | 509 | 43 | 1321 |
| Production of organic inputs | 29 | 1128 | 14 | 460 | 43 | 1588 |
| Others (pl specify) | 3 | 79 | 4 | 181 | 7 | 260 |
| Total | 701 | 20365 | 369 | 12877 | 1070 | 33242 |

Table 10.3 Training on Horticulture including sponsored

| Area of Training | Raia | sthan | Gui | arat | Grand Total | | |
|---|------|-------|-----|------|-------------|------|--|
| Area of Training | C | Р | C | P | C | P | |
| (a) Vegetable Crops | C | • | C | 1 | C | • | |
| Production of low value and high valume crops | 53 | 1442 | 39 | 993 | 92 | 2435 | |
| Off-season vegetables | 25 | 682 | 25 | 804 | 50 | 1486 | |
| Nursery raising | 36 | 987 | 32 | 911 | 68 | 1898 | |
| Exotic vegetables | 2 | 52 | 0 | 0 | 2 | 52 | |
| Export potential vegetables | 1 | 20 | 6 | 170 | 7 | 190 | |
| Grading and standardization | 4 | 98 | 2 | 37 | 6 | 135 | |
| Protective cultivation | 30 | 782 | 25 | 1323 | 55 | 2105 | |
| Others (pl specify) | 9 | 351 | 8 | 309 | 17 | 660 | |
| Total (a) | 160 | 4414 | 137 | 4547 | 297 | 8961 | |
| (b) Fruits | | | | | | | |
| Training and Pruning | 19 | 466 | 2 | 76 | 21 | 542 | |
| Layout and Management of Orchards | 45 | 1293 | 9 | 243 | 54 | 1536 | |
| Cultivation of Fruit | 34 | 1024 | 27 | 950 | 61 | 1974 | |
| Management of young plants/orchards | 15 | 405 | 7 | 256 | 22 | 661 | |
| Rejuvenation of old orchards | 7 | 185 | 3 | 94 | 10 | 279 | |
| Export potential fruits | 1 | 36 | 4 | 153 | 5 | 189 | |
| Micro irrigation systems of orchards | 6 | 208 | 15 | 573 | 21 | 781 | |
| Plant propagation techniques | 3 | 85 | 6 | 178 | 9 | 263 | |
| Others (pl specify) | 3 | 70 | 9 | 315 | 12 | 385 | |
| Total (b) | 133 | 3772 | 82 | 2838 | 215 | 6610 | |
| (c) Ornamental Plants | | | | | | | |
| Nursery Management | 4 | 105 | 5 | 139 | 9 | 244 | |
| Propagation techniques of Ornamental Plants | 5 | 126 | 1 | 23 | 6 | 149 | |
| Total (c) | 9 | 231 | 6 | 162 | 15 | 393 | |
| (d) Plantation crops | | | | | | | |
| Production and Management technology | 4 | 94 | 8 | 253 | 12 | 347 | |
| Total (d) | 4 | 94 | 10 | 304 | 14 | 398 | |
| (e) Tuber crops | | | | | | | |
| Production and Management technology | 2 | 84 | 7 | 235 | 9 | 319 | |
| Total (e) | 2 | 84 | 7 | 235 | 9 | 319 | |



| Area of Training | Raja | sthan | Guj | arat | Grand Total | |
|--|------|-------|-----|------|--------------------|-------|
| | C | P | C | P | C | P |
| (f) Spices | | | | | | |
| Production and Management technology | 43 | 1426 | 20 | 819 | 63 | 2245 |
| Processing and value addition | 2 | 85 | 3 | 115 | 5 | 200 |
| Others (pl specify) | 1 | 150 | 0 | 0 | 1 | 150 |
| Total (f) | 46 | 1661 | 23 | 934 | 69 | 2595 |
| (g) Medicinal and Aromatic Plants | | | | | | |
| Production and management technology | 6 | 276 | 0 | 0 | 6 | 276 |
| Post harvest technology and value addition | 2 | 78 | 1 | 85 | 3 | 163 |
| Total (g) | 8 | 354 | 1 | 85 | 9 | 439 |
| GT (a-g) | 362 | 10610 | 266 | 9105 | 628 | 19715 |

(10), micro nutrient deficiency in crops (8), nutrient use efficiency (11), balance use of fertilizers (11), soil and water testing (45) and others (5). Numbers of farmers / farm women

benefited were 1564, 289, 1118, 1197, 250, 288, 310, 327, 1632 and 235 respectively. The state wise details are given in Table 10.4.

Table 10.4 Training on soil health and fertility management including sponsored

| Area of Training | Rajas | sthan | Guj | arat | Grand Total | | |
|--------------------------------------|-------|-------|-----|------|--------------------|------|--|
| | C | P | C | P | C | P | |
| Soil fertility management | 20 | 583 | 26 | 981 | 46 | 1564 | |
| Integrated water management | 5 | 127 | 6 | 162 | 11 | 289 | |
| Integrated Nutrient Management | 24 | 681 | 19 | 437 | 43 | 1118 | |
| Production and use of organic inputs | 20 | 659 | 11 | 538 | 31 | 1197 | |
| Management of Problematic soils | 6 | 147 | 4 | 103 | 10 | 250 | |
| Micro nutrient deficiency in crops | 5 | 138 | 3 | 150 | 8 | 288 | |
| Nutrient Use Efficiency | 9 | 230 | 2 | 80 | 11 | 310 | |
| Balance use of fertilizers | 11 | 327 | 0 | 0 | 11 | 327 | |
| Soil and Water Testing | 27 | 769 | 18 | 863 | 45 | 1632 | |
| Others | 4 | 175 | 1 | 60 | 5 | 235 | |
| Total | 131 | 3836 | 90 | 3374 | 221 | 7210 | |



Livestock Production and Management

KVKs of Rajasthan and Gujarat organized a total number of 661 training programmes including 19307 farmers took active part. The specific training programmes were dairy management (206), poultry management (24), rabbit management (1), animal nutrition management (126), disease management (122), feed & fodder management (133), production of quality animal (29) and others (20). The training programmes were attended by 5757, 750, 23, 4075, 3449, 3736, 942 and 575 farmers and farm women, respectively. The state wise details are given in Table 10.5.

Home Science/women empowerment

KVKs of this zone organized a total number of 443 training programmes for 13841 beneficiaries. The major areas were Household food security by kitchen gardening and nutrition gardening (72), Design and development of low/minimum cost diet (26), Designing and



Vocational training KVK Rajkot-I

development for high nutrient efficiency diet (23), Minimization of nutrient loss in processing (16), Processing and cooking (14), Gender mainstreaming through SHGs (25), Storage loss minimization techniques (26), Value addition(108), Women empowerment (39), Location specific drudgery reduction technologies (41), Rural Crafts (11), Women and child care (39), and Others (9) The state wise details are given in Table 10.6.

Table 10.5 Training on livestock production and management including sponsored

| Area of Training | Raja | sthan | Guja | arat | Grand Total | |
|---------------------------------------|------|-------|------|------|--------------------|-------|
| | C | P | C | P | C | P |
| Dairy Management | 121 | 3151 | 85 | 2606 | 206 | 5757 |
| Poultry Management | 22 | 656 | 2 | 94 | 24 | 750 |
| Rabbit Management | 1 | 23 | 0 | 0 | 1 | 23 |
| Animal Nutrition Management | 91 | 2750 | 35 | 1325 | 126 | 4075 |
| Disease Management | 59 | 1503 | 63 | 1946 | 122 | 3449 |
| Feed & fodder technology | 75 | 1954 | 58 | 1782 | 133 | 3736 |
| Production of quality animal products | 13 | 318 | 16 | 624 | 29 | 942 |
| Others (pl specify) | 15 | 431 | 5 | 144 | 20 | 575 |
| Total | 397 | 10786 | 264 | 8521 | 661 | 19307 |

Table 10.6 Training on Home Science/women empowerment including sponsored

| Area of Training | Raja | sthan | Gujarat | | Grand Total | |
|--|------|-------|---------|------|--------------------|-------|
| | C | P | C | P | C | P |
| Household food security by kitchen gardening and nutrition gardening | 41 | 1230 | 31 | 1039 | 72 | 2269 |
| Design and development of low/minimum cost diet | 13 | 473 | 13 | 383 | 26 | 856 |
| Designing and development for high nutrient efficiency diet | 8 | 221 | 15 | 520 | 23 | 741 |
| Minimization of nutrient loss in processing | 6 | 155 | 10 | 287 | 16 | 442 |
| Processing and cooking | 7 | 173 | 7 | 208 | 14 | 381 |
| Gender mainstreaming through SHGs | 10 | 240 | 15 | 514 | 25 | 754 |
| Storage loss minimization techniques | 16 | 534 | 10 | 265 | 26 | 799 |
| Value addition | 42 | 1183 | 66 | 2135 | 108 | 3318 |
| Women empowerment | 23 | 758 | 16 | 551 | 39 | 1309 |
| Location specific drudgery reduction technologies | 20 | 613 | 21 | 760 | 41 | 1373 |
| Rural Crafts | 3 | 86 | 8 | 207 | 11 | 293 |
| Women and child care | 13 | 338 | 20 | 649 | 33 | 987 |
| Others (pl specify) | 5 | 152 | 4 | 167 | 9 | 319 |
| Total | 207 | 6156 | 236 | 7685 | 443 | 13841 |

Agricultural Engineering

A total number of 150 training programmes were organized by KVKs of this zone benefiting 4603 farmers. Major areas of trainings were repair and maintenance of Farm Machinary and its maintenance (21), Installation and maintenance of micro irrigation systems (46), Use of Plastics in farming practices (5), Production of small tools and implements (10), Repair and maintenance of farm machinery and implements (23), Small scale processing and value addition (13), Post Harvest Technology (19) and Others (13) benefiting 637, 1464, 166, 279, 694, 312, 632 and 419 farmers. The details are given in Table 10.7.

Plant Protection

Training programmes related to plant protection constituted 551 courses for 17692 farmers of Rajasthan and Gujarat. The various aspects like integrated pest management (271),



Participants taking practical knowledge about insecticide spray in fenugreek KVK Jhunjhunu



Table 10.7 Training on agricultural engineering including sponsored

| Area of Training | Rajasthan | | Gu | jarat | Grand Total | |
|--|-----------|-----|-----|-------|--------------------|------|
| | C | P | C | P | C | P |
| Farm Machinary and its maintenance | 9 | 233 | 12 | 404 | 21 | 637 |
| Installation and maintenance of micro irrigation systems | 7 | 176 | 39 | 1288 | 46 | 1464 |
| Use of Plastics in farming practices | 0 | 0 | 5 | 166 | 5 | 166 |
| Production of small tools and implements | 4 | 102 | 6 | 177 | 10 | 279 |
| Repair and maintenance of farm machinery and implements | 3 | 74 | 20 | 620 | 23 | 694 |
| Small scale processing and value addition | 1 | 17 | 12 | 295 | 13 | 312 |
| Post Harvest Technology | 8 | 195 | 11 | 437 | 19 | 632 |
| Others (pl specify) | 1 | 24 | 12 | 395 | 13 | 419 |
| Total | 33 | 821 | 117 | 3782 | 150 | 4603 |

integrated disease management (143), biocontrol of pests and diseases (79), production of bio control agents and bio pesticides (28) and others (30) benefiting 8835, 4362, 2492, 956, and 1047 farmers, respectively. The state wise details are given in Table 10.8.

Fish Production

KVKs had organized 45 training programmes related to fish production in which 1399 fish farmers actively took part. The

specific areas were Integrated fish farming (14), Carp breeding and hatchery management (2), Carp fry and fingerling rearing (3), Composite fish culture (5), Hatchery management and culture of freshwater prawn (2), Breeding and culture of ornamental fishes (1), Pen culture of fish and prawn (1), Shrimp farming (2), Edible oyster farming (7), Fish processing, value addition (4) and Others (4). The state wise details are given in Table 10.9.

Table 10.8 Training on plant protection including sponsored

| Area of Training | Rajasthan | | Gu | ıjarat | Grand Total | |
|---|-----------|------|-----|--------|--------------------|-------|
| | C | P | C | P | C | P |
| Integrated Pest Management | 121 | 3451 | 150 | 5384 | 271 | 8835 |
| Integrated Disease Management | 68 | 1761 | 75 | 2601 | 143 | 4362 |
| Bio-control of pests and diseases | 28 | 876 | 51 | 1616 | 79 | 2492 |
| Production of bio control agents and bio pesticides | 14 | 475 | 14 | 481 | 28 | 956 |
| Others | 10 | 308 | 20 | 739 | 30 | 1047 |
| Total | 241 | 6871 | 310 | 10821 | 551 | 17692 |



Table 10.9 Training on fish production including sponsored

| Area of Training | Raja | asthan | G | ujarat | Grand Total | | |
|---|------|--------|----|--------|--------------------|------|--|
| | C | P | C | P | C | P | |
| Integrated fish farming | 4 | 101 | 10 | 265 | 14 | 366 | |
| Carp breeding and hatchery management | 0 | 0 | 2 | 102 | 2 | 102 | |
| Carp fry and fingerling rearing | 0 | 0 | 3 | 112 | 3 | 112 | |
| Composite fish culture | 0 | 0 | 5 | 80 | 5 | 80 | |
| Hatchery management and culture of freshwater prawn | 0 | 0 | 2 | 74 | 2 | 74 | |
| Breeding and culture of ornamental fishes | 0 | 0 | 1 | 36 | 1 | 36 | |
| Portable plastic carp hatchery | 0 | 0 | 1 | 52 | 1 | 52 | |
| Pen culture of fish and prawn | 0 | 0 | 2 | 51 | 2 | 51 | |
| Shrimp farming | 0 | 0 | 7 | 212 | 7 | 212 | |
| Fish processing and value addition | 0 | 0 | 4 | 183 | 4 | 183 | |
| Others (pl specify) | 0 | 0 | 4 | 131 | 4 | 131 | |
| Total | 4 | 101 | 41 | 1298 | 45 | 1399 | |

Training on production of inputs

Production of input at the site related 41 training programmes were conducted by KVKs to train 1297 farmers and farm women. The state wise details are depicted in Table 10.10.

Capacity Building and Group Dynamics

A total of 291 specialized training courses on capacity building and group dynamics were organized for 10039 participants. The state wise details are shown in Table 10.11.

Table 10.10 Training on production of input at the site

| Area of Training | Raja | sthan | Gu | ijarat | Grand Total | | |
|---|------|-------|----|--------|--------------------|------|--|
| | C | P | C | P | C | P | |
| Seed Production | 2 | 48 | 3 | 121 | 5 | 169 | |
| Bio-agents production | 2 | 43 | 0 | 0 | 2 | 43 | |
| Bio-fertilizer production | 0 | 0 | 1 | 20 | 1 | 20 | |
| Vermi-compost production | 11 | 284 | 3 | 71 | 14 | 355 | |
| Organic manures production | 7 | 169 | 4 | 135 | 11 | 304 | |
| Production of livestock feed and fodder | 2 | 65 | 1 | 173 | 3 | 238 | |
| Mushroom Production | 1 | 23 | 3 | 106 | 4 | 129 | |
| Apiculture | 1 | 39 | 0 | 0 | 1 | 39 | |
| Total | 26 | 671 | 15 | 626 | 41 | 1297 | |



Table 10.11 Training on Capacity Building and Group Dynamics

| Area of Training | Rajasthan | | Gu | jarat | Grand Total | | |
|---|-----------|------|----|-------|--------------------|-------|--|
| | C | P | C | P | C | P | |
| Leadership development | 29 | 753 | 21 | 659 | 50 | 1412 | |
| Group dynamics | 21 | 666 | 8 | 286 | 29 | 952 | |
| Formation and Management of SHGs | 32 | 913 | 15 | 516 | 47 | 1429 | |
| Mobilization of social capital | 21 | 667 | 9 | 273 | 30 | 940 | |
| Entrepreneurial development of farmers/youths | 44 | 1322 | 24 | 1055 | 68 | 2377 | |
| WTO and IPR issues | 5 | 290 | 5 | 167 | 10 | 457 | |
| Others | 45 | 1800 | 12 | 672 | 57 | 2472 | |
| Total | 197 | 6411 | 94 | 3628 | 291 | 10039 | |

Agro Forestry

Agro forestry related 13 training programmes were organized by KVKs of Rajasthan for 301 practicing farmers. The details of training programmes and participants are given in Table 10.12.

Vocational Training programmes

A total number of 149 vocational trainings conducted by KVKs in zone comprising 64 in Rajasthan and 85 in Gujarat benefiting 3907 participants. The major areas were crop production and management (20), post harvest technology and value addition (36), livestock and fisheries (17), income generation activities (65) and agricultural extension (11). The state wise details are given in Table 10.13.

Rural youth

For the rural youth a total number of 229 training courses were organized in which 7040 rural youth including male and female acquired skill for gainful employment at their doorstep. A total of 130 training courses with 3739 participants were organized by Rajasthan whereas 99 & 3301 by Gujarat. The overall

Table 10.12 Training on Agro forestry

| Area of Training | Rajasthan | | Gu | ıjarat | Grand Total | | |
|----------------------------|-----------|-----|----|--------|--------------------|-----|--|
| | C | P | C | P | C | P | |
| Production technologies | 6 | 138 | 0 | 0 | 6 | 138 | |
| Integrated Farming Systems | 7 | 163 | 0 | 0 | 7 | 163 | |
| Total | 13 | 301 | 0 | 0 | 13 | 301 | |



Table 10.13 Vocational Training programmes

| Area of Training | Rajasthan | | G | ujarat | Grand Total | | |
|--|-----------|------|----|--------|--------------------|------|--|
| | C | P | C | P | C | P | |
| Crop production and management | 8 | 212 | 12 | 286 | 20 | 498 | |
| Post harvest technology and value addition | 13 | 362 | 23 | 630 | 36 | 992 | |
| Livestock and fisheries | 8 | 179 | 9 | 214 | 17 | 393 | |
| Income generation activities | 28 | 815 | 37 | 933 | 65 | 1748 | |
| Agricultural Extension | 7 | 156 | 4 | 120 | 11 | 276 | |
| Grand Total | 64 | 1724 | 85 | 2183 | 149 | 3907 | |

female participation in trainings for rural youth was 2545 (36.15%) comprising 1033 (27.62%) from Rajasthan and 1512 (45.80%) Gujarat. The

state wise details of training programmes and participants are depicted in Table 10.14

Table 10.14 Training for Rural youth including sponsored

| Area of Training | Rajas | sthan | Gujarat | | Grand Total | |
|---|-------|-------|---------|-----|--------------------|-----|
| | C | P | C | P | C | P |
| Nursery Management of Horticulture crops | 10 | 290 | 5 | 79 | 15 | 369 |
| Training and pruning of orchards | 1 | 29 | 3 | 65 | 4 | 94 |
| Protected cultivation of vegetable crops | 1 | 42 | 1 | 30 | 2 | 72 |
| Commercial fruit production | 4 | 108 | 2 | 44 | 6 | 152 |
| Integrated farming | 8 | 289 | 7 | 275 | 15 | 564 |
| Seed production | 4 | 159 | 4 | 178 | 8 | 337 |
| Production of organic inputs | 2 | 50 | 8 | 232 | 10 | 282 |
| Planting material production | 7 | 153 | 0 | 10 | 7 | 163 |
| Vermi-culture | 9 | 270 | 4 | 138 | 13 | 408 |
| Mushroom Production | 8 | 206 | 5 | 179 | 13 | 385 |
| Bee-keeping | 9 | 303 | 1 | 40 | 10 | 343 |
| Repair and maintenance of farm machinery and implements | 4 | 147 | 7 | 234 | 11 | 381 |
| Value addition | 16 | 423 | 14 | 365 | 30 | 788 |
| Small scale processing | 1 | 30 | 2 | 37 | 3 | 67 |
| Post Harvest Technology | 2 | 60 | 3 | 97 | 5 | 157 |
| Tailoring and Stitching | 5 | 146 | 4 | 107 | 9 | 253 |



| Area of Training | Rajas | Rajasthan | | Gujarat | | l Total |
|--|-------|-----------|----|---------|-----|---------|
| | C | P | C | P | C | P |
| Rural Crafts | 0 | 0 | 8 | 214 | 8 | 214 |
| Production of quality animal products | 0 | 0 | 0 | 25 | 0 | 25 |
| Dairying | 4 | 87 | 9 | 463 | 13 | 550 |
| Sheep and goat rearing | 8 | 230 | 0 | 0 | 8 | 230 |
| Rabbit farming | 2 | 32 | 0 | 0 | 2 | 32 |
| Poultry production | 4 | 81 | 2 | 37 | 6 | 118 |
| Composite fish culture | 3 | 89 | 0 | 0 | 3 | 89 |
| Fish harvest and processing technology | 0 | 0 | 1 | 40 | 1 | 40 |
| Fry and fingerling rearing | 1 | 36 | 1 | 138 | 2 | 174 |
| Any other (pl. specify) | 17 | 479 | 8 | 274 | 25 | 753 |
| Total | 130 | 3739 | 99 | 3301 | 229 | 7040 |

Extension Personnel

A total number of 172 training courses were organized in which 5668 extension personnel took part. Out of which Rajasthan organized 90 training courses with 2417 participants whereas Gujarat organized 82 courses with 3251 participants. The state wise details of training programmes and participants are given in Table 10.15.



Extension Functionaries Training at KVK, Dungarpur

Table 10.15 Training for extension personnel including sponsored

| Area of Training | Rajasthan | | Guj | arat | Grand Total | |
|---|-----------|-----|-----|------|--------------------|------|
| | C | P | C | P | C | P |
| Productivity enhancement in field crops | 18 | 480 | 12 | 313 | 30 | 793 |
| Integrated Pest Management | 4 | 79 | 25 | 1391 | 29 | 1470 |
| Integrated Nutrient management | 8 | 175 | 6 | 160 | 14 | 335 |
| Rejuvenation of old orchards | 2 | 47 | 2 | 51 | 4 | 98 |
| Protected cultivation technology | 2 | 72 | 1 | 25 | 3 | 97 |



| Area of Training | Rajasthan | | Gujarat | | Grand Total | |
|---|-----------|------|---------|------|--------------------|------|
| | C | P | C | P | C | P |
| Production and use of organic inputs | 2 | 43 | 4 | 272 | 6 | 315 |
| Care and maintenance of farm machinery and implements | 0 | 0 | 1 | 23 | 1 | 23 |
| Gender mainstreaming through SHGs | 6 | 122 | 0 | 0 | 6 | 122 |
| Formation and Management of SHGs | 2 | 54 | 1 | 20 | 3 | 74 |
| Women and Child care | 4 | 80 | 5 | 161 | 9 | 241 |
| Group Dynamics and farmers organization | 4 | 107 | 4 | 179 | 8 | 286 |
| Information networking among farmers | 6 | 166 | 1 | 20 | 7 | 186 |
| Capacity building for ICT application | 5 | 208 | 2 | 44 | 7 | 252 |
| Management in farm animals | 9 | 293 | 2 | 73 | 11 | 366 |
| Livestock feed and fodder production | 1 | 27 | 2 | 58 | 3 | 85 |
| Household food security | 1 | 33 | 4 | 146 | 5 | 179 |
| Any other (pl. specify) | 16 | 431 | 10 | 315 | 26 | 746 |
| Total | 90 | 2417 | 82 | 3251 | 172 | 5668 |





EXTENSION ACTIVITIES

KVKs have made all concerted efforts in conducting various extension activities to create awareness and mobilize on new technologies and also to accelerate the technology transfer process (Table 11.1). During 2016-17, KVKs of Zone-VI organized Advisory Services (32978), Diagnostic visits (2102), Field Day (671), Group discussions (671), Kisan Ghosthi (567), Film Show (1434), Self-help groups (115), Kisan Mela (99), Exhibition (312), Scientists' visit to farmers field (4773), Plant/animal health camps (164), Farm Science Club (47), Ex-trainees Sammelan (45), Farmers' seminar/workshop

(171), Method Demonstrations (863), Celebration of important days (193), Special day celebration (109), Exposure visits (292) and others (16373) with the participation of 1458439 farmers and 22833 extension personnel, input dealers, local traders, Hon'ble MP, MLA, etc. took part. Moreover, 208817 other extension activities viz. electronic media, newspaper coverage, radio talks, television talks, popular articles, animal health camps (number of animals treated), lecture delivered as a resource person, extension literature, technical bulletin and technical reports were also performed by

Table 11.1 Physical achievements of extension activities

| Activities | Rajasthan | Gujarat | Total | | | |
|-----------------------------|-----------|---------|---------|--|--|--|
| Extension activities | | | | | | |
| No. of programmes | 36896 | 25083 | 61979 | | | |
| | | | | | | |
| No. of farmers | 698125 | 760314 | 1458439 | | | |
| No. of extension personnel | 15500 | 7333 | 22833 | | | |
| Total beneficiaries | 713625 | 767647 | 1481272 | | | |
| Other extension activities | 106588 | 102229 | 208817 | | | |
| Mobile advisory services | | | | | | |
| No. of KVKs | | 72 | | | | |
| No. of text SMS sent | | 34143 | | | | |
| No. of farmers benefited | 5762369 | | | | | |
| No. of voice messages sent | 2247 | | | | | |
| No. of farmers benefited | | 37879 | | | | |



KVKs. In Zone-VI, all the 72 KVKs were involved in mobile advisory services. A total of 34143 text messages were delivered on various aspects of agriculture for the benefit of 5762369 farmers. Out of 72 KVKs, 25 KVKs were delivered voice messages. A total of 2247 vSMS were also sent to 37879 farmers on scientific agro-techniques.

Extension activities organized by KVKs of Rajasthan

In the state, KVKs organized many activities like Advisory Services (20334), Diagnostic visits (882), Field Days (297), Group discussions (204), Kisan Ghosthi (257), Film Show (666), Self-help groups (72), Kisan Mela (43), Exhibition (175), Scientists' visit to farmers field (2304), Plant/animal health camps (32), Farm Science Club (37), Ex-trainees Sammelan (17), Farmers' seminar/workshop (108), Method Demonstrations (387), Celebration of important days (89), Special day celebration (59), Exposure visits (161) and Others (10769). In these activities, Hon'ble MP, MLA, farmers, farm women, rural youth, officials of department of Agriculture, Line Departments, Input Dealers, Local Traders, NGOs, etc. took active part.



Swachhta Pakhwada KVK, Jamnagar

Under other extension activities like Electronic Media (CD/DVD), Extension Literature, News paper coverage, Popular articles, Radio Talks, TV Talks, Animal health amps (Number of animals treated) and other activities were performed for mass contact 106588 programmes were organised. The details are given in Table 11.2 and Table 11.3.

Extension activities organized by KVKs of Gujarat

KVKs of Gujarat state organized various extension activities viz., Advisory Services (12644), Diagnostic visits (1220), Field Day (374), Group discussions (467), Kisan Ghosthi (310), Film Show (768), Self-help groups (43), Kisan Mela (53), Exhibition (137), Scientists' visit to farmers field (2469), Plant/animal health camps (132), Farm Science Club (10), Extrainees Sammelan (28), Farmers' seminar/ workshop (63), Method Demonstrations (476), Celebration of important days (104), Special day celebration (50), Exposure visits (131) and Others (5604) through which different technologies of agricultural and allied sectors transferred to 760314 farmers and 7333 extension personnel. The details are given in Table 11.4. A total of 102229 other extension



Addressing the students about Jai Kisan Jai Vigyan week KVK, Jhunjhunu



Table 11.2 Extension activities organized by KVKs of Rajasthan

| Activities | No. of programmes | No. of farmers | No. of Extension Personnel | Total |
|------------------------------------|-------------------|----------------|-------------------------------|--------|
| Advisory Services | 20334 | 113991 | 969 | 114960 |
| Diagnostic visits | 882 | 5654 | 577 | 6231 |
| Field Day | 297 | 16379 | 965 | 17344 |
| Group discussions | 204 | 4516 | 241 | 4757 |
| Kisan Ghosthi | 257 | 33418 | 882 | 34300 |
| Film Show | 666 | 25884 | 1012 | 26896 |
| Self -help groups | 72 | 1557 | 52 | 1609 |
| Kisan Mela | 46 | 56491 | 1818 | 58309 |
| Exhibition | 175 | 281540 | 4158 | 285698 |
| Scientists' visit to farmers field | 2304 | 31895 | 1292 | 33187 |
| Plant/animal health camps | 32 | 2354 | 91 | 2445 |
| Farm Science Club | 37 | 1115 | 67 | 1182 |
| Ex-trainees Sammelan | 17 | 595 | 41 | 636 |
| Farmers' seminar/workshop | 108 | 2406 | 287 | 2693 |
| Method Demonstrations | 387 | 7687 | 386 | 8073 |
| Celebration of important days | 89 | 9159 | 572 | 9731 |
| Special day celebration | 59 | 7839 | 745 | 8584 |
| Exposure visits | 161 | 6405 | 305 | 6710 |
| Others (pl. specify) | 10769 | 89240 | 1040 | 90280 |
| Total | 36896 | 698125 | 15500 | 713625 |



Exhibition KVK, Jamnagar



FPO KVK, Bundi



| Particulars | Number | No. of KVKs |
|--|--------|-------------|
| Electronic Media (CD./DVD) | 84 | 12 |
| Extension Literature | 79506 | 35 |
| News paper coverage | 1598 | 41 |
| Popular articles | 276 | 35 |
| Radio Talks | 238 | 32 |
| TV Talks | 191 | 19 |
| Animal health amps (Number of animals treated) | 7192 | 15 |
| Others | 17503 | 16 |
| Total | 106588 | |

Table 11.3 Other extension activities organized by KVKs of Rajasthan

activities were also performed by KVKs functioning in Gujarat state (Table 11.5).

Technology week celebration

KVKs had implemented technology week to show the available agricultural and allied technologies for extension functionaries & farmers. Farmers could directly interact with KVK experts, technology generator and extension personnel to adopt new technologies during technology week. A total 40 KVKs from Zone-VI (16 KVKs from Rajasthan & 24 from Gujarat) celebrated the technology week.



Mahila Sashaktikaran week KVK, Jamnagar

Various activities have been conducted like gosthies, lectures, exhibitions, film shows, fairs, farm visits, diagnostic practicals, distribution of literatures, seeds, planting materials, bioproducts, etc., during technology week. From Zone-VI, 33626 farmers and farm women participated (16468 in Rajasthan and 17158 in Gujarat) to get the benefits from the technology week. Details are given in table 11.6.

A total number of 32 technology weeks were celebrated by KVKs of Rajasthan and Gujarat The details of activities are given in table 11.6.



Greengram Field day - KVK, Baran

Table 11.4 Extension activities organized by KVKs of Gujarat

| Activities | No. of programmmes | No. of farmers | No. of extension personnel | Total |
|------------------------------------|--------------------|----------------|----------------------------|--------|
| Advisory Services | 12644 | 225446 | 892 | 226338 |
| Diagnostic visits | 1220 | 5152 | 192 | 5344 |
| Field Day | 374 | 16762 | 292 | 17054 |
| Group discussions | 467 | 11978 | 198 | 12176 |
| KisanGhosthi | 310 | 18202 | 431 | 18633 |
| Film Show | 768 | 28000 | 875 | 28875 |
| Self -help groups | 43 | 1000 | 20 | 1020 |
| KisanMela | 53 | 66838 | 770 | 67608 |
| Exhibition | 137 | 190460 | 1280 | 191740 |
| Scientists' visit to farmers field | 2469 | 10621 | 688 | 11309 |
| Plant/animal health camps | 132 | 3229 | 49 | 3278 |
| Farm Science Club | 10 | 178 | 9 | 187 |
| Ex-trainees Sammelan | 28 | 2275 | 15 | 2290 |
| Farmers' seminar/workshop | 63 | 12787 | 112 | 12899 |
| Method Demonstrations | 476 | 6825 | 128 | 6953 |
| Celebration of important days | 104 | 16053 | 300 | 16353 |
| Special day celebration | 50 | 13853 | 184 | 14037 |
| Exposure visits | 131 | 5293 | 90 | 5383 |
| Others (pl. specify) | 5604 | 125362 | 808 | 126170 |
| Total | 25083 | 760314 | 7333 | 767647 |

Table 11.5 Other extension activities organized by KVKs of Gujarat

| Particulars | No. | No. of KVKs |
|--|--------|-------------|
| Electronic Media (CD./DVD) | 190 | 5 |
| Extension Literature | 94563 | 23 |
| News paper coverage | 271 | 25 |
| Popular articles | 155 | 23 |
| Radio Talks | 65 | 10 |
| TV Talks | 46 | 9 |
| Animal health amps (Number of animals treated) | 6236 | 18 |
| Others (pl. specify) | 703 | 12 |
| Total | 102229 | |



Table 11.6 Activities conducted under technology week celebration in Rajasthan and Gujarat

| Type of activities | No. of activities | Number of participants |
|---|-------------------|------------------------|
| Gosthies | 86 | 11424 |
| Lectures organised | 506 | 12972 |
| Exhibition | 103 | 11199 |
| Film show | 123 | 6373 |
| Fair | 7 | 7124 |
| Farm Visit | 214 | 7312 |
| Diagnostic Practicals | 91 | 1665 |
| Distribution of Literature (No.) | 24451 | 22603 |
| Distribution of Seed (q) | 2 | 118 |
| Distribution of Planting materials (No.) | 7679 | 834 |
| Bio Product distribution (Kg) | 717 | 616 |
| Bio Fertilizers (q) | 6.5 | 31 |
| Distribution of fingerlings | 3 | 1500 |
| Distribution of Livestock specimen (No.) | 66 | 30 |
| Total number of farmers visited the technology week | | 35040 |



Kisan Mela - KVK, Baran



PMFBY - KVK, Bhilwara



Soil Health Day - KVK, Baran



Scientist visit at farmer's field - KVK, Bhilwara





SEED AND PLANTING MATERIAL PRODUCTION

Seed Production

Majority of the KVKs are producing seeds of different crops at their instructional farms to make available the quality seeds of newly released varieties to the farmers and to increase the revolving fund. The information related to seed production, planting material, bio-products and livestock progeny are given in Table 12.1 to 12.16.

During the year 2016-17, KVKs of this zone produced 18876.235 g seed valued at Rs.

93821108. Out of the total seed production contribution of pulses was more (10000 q) followed by cereals (5891.74 q), oilseeds (1871.81 q), commercial (575.64 q), spices (370.71 q), millets (58.79q), others (47.695 q), fodder (39.07 q) and medicinal (18.08 q), vegetable (2.7 q). The seeds produced were distributed to 35476 farmers in respective district. The state wise crop-wise are given in Table 12.1.

Table 12.1 Physical achievement of seed production

| Enterprise | Rajasthan | | | Gujarat | | | Total | | |
|------------|--------------|-------------|----------------------------|--------------|-------------|----------------------------|--------------|-------------|----------------------------|
| | Quantity (q) | Value (Rs.) | Provided to no. of farmers | Quantity (q) | Value (Rs.) | Provided to no. of farmers | Quantity (q) | Value (Rs.) | Provided to no. of farmers |
| Oilseeds | 1231.37 | 7197634.00 | 9556 | 640.44 | 6206215.00 | 1619 | 1871.81 | 13403849.00 | 11175 |
| Pulses | 6500 | 32500000.00 | 10648 | 3500 | 17500000.00 | 5923 | 10000 | 50000000.00 | 16571 |
| cereals | 4231.2 | 18334987.00 | 4869 | 1660.54 | 4536025.00 | 4011 | 5891.74 | 22871012.00 | 8880 |
| Millets | 58.79 | 288300.00 | 441 | | | | 58.79 | 288300.00 | 441 |
| spices | 331.98 | 4255292.00 | 1649 | 38.73 | 645230.00 | 375 | 370.71 | 4900522.00 | 2024 |
| fodder | 26.63 | 151548.00 | 244 | 12.44 | 93697.00 | 255 | 39.07 | 245245.00 | 499 |
| Commercial | 220.13 | 1516350.00 | 1176 | 355.51 | 90889.00 | 33 | 575.64 | 1607239.00 | 1209 |
| Medicinal | 8.38 | 125700.00 | 145 | 9.7 | 87300.00 | 185 | 18.08 | 213000.00 | 330 |
| Vegetable | | | | 2.7 | 86000.00 | 60 | 2.7 | 86000.00 | 60 |
| Others | 33.515 | 127951.00 | 204 | 14.18 | 77990.00 | 83 | 47.695 | 205941.00 | 287 |
| Total | 12641.995 | 64497762.00 | 28932 | 6234.24 | 29323346.00 | 12544 | 18876.235 | 93821108.00 | 41476 |



Oilseeds

KVKs of this zone produced a total of 1871.81 q which valued Rs. 13403849. Among oilseeds seeds of groundnut (678.38 q), linseed (7.9 q) mustard (774.2 q), niger (0.45 q), sesame (67.62 q), soybean (329.35 q), castor (6.1 q) and taramira (7.81 q) which worth Rs. 13403849. These seeds produced were provided to 11175 farmers. The major varieties used for seed production were as HNG-69, Mallika, HNG-123, GG-20, UG-5, J.L.501, GJG-22, GJG-17,



Seed production programme - KVK, Jhalawar

GJG-9, GJG-17, GAUG-10, GJG-31 and GG-2 (groundnut), NRCDR 2, PM-28, Giriraj, RH-406, PM-26, Laxmi, RGN-298, RGN-229, NRC HB-101, RH 406, RH 749, RH 8812, MAYA and GDM-4 (mustard), Pratap Alsi-2 (linseed), RT-351, RT-346, RT -127, GT-10, GT-1, GT-5, GT-4, GT-3 and GT-2 (sesame) JS 95-60, RKS 24, , NRC-37, JS-335 and GJS-3 (soyabean) RTM-314, RTM 1355 and RTM 2002 (Taramira) and GN-2 (Niger). The state wise details are given in Table 12.2

Pulses

KVKs of this zone produced 6500 q pulse seeds which comprised mainly blackgram (2204.12 q), cowpea (43.53 q), chickpea (2879.26 q), greengram (4757 q), mothbean (21.2q) and pegion pea(94.89q). These seeds produced were made available to 16571 farmers valued Rs. 18961869. The seeds of important varieties of different pulses produced viz. blackgram (Pratap Urd 1, PU 30, Azad 3, PU-31, PU-1, IPU 94-1 and GU-1) cowpea (RC-19,

| Table | 12.2 See | d production | of different | oilseed | crops |
|--------------|----------|--------------|--------------|---------|-------|
|--------------|----------|--------------|--------------|---------|-------|

| Oilseeds | Rajasthan | | | | Gujarat | | | Total | | | |
|-----------|--------------|-------------|----------------|--------------|----------------|----------------|--------------|-------------|----------------|--|--|
| | Quantity (q) | Value (Rs.) | No. of farmers | Quantity (q) | Value (Rs.) | No. of farmers | Quantity (q) | Value (Rs.) | No. of farmers | | |
| Groundnut | 172.45 | 1657250.00 | 191 | 505.93 | 5160819.00 | 548 | 678.38 | 6818069.00 | 739 | | |
| Linseed | 7.9 | 63200.00 | 45 | 0 | 0.00 | 0 | 7.9 | 63200.00 | 45 | | |
| Mustard | 768.21 | 4153154.00 | 7741 | 5.99 | 31399.00 | 56 | 774.2 | 4184553.00 | 7797 | | |
| Sesame | 18.88 | 245800.00 | 227 | 48.74 | 603670.00 | 575 | 67.62 | 849470.00 | 802 | | |
| Soybean | 256.12 | 1039180.00 | 1172 | 73.23 | 384070.00 | 344 | 329.35 | 1423250.00 | 1516 | | |
| Niger | 0 | 0.00 | 0 | 0.45 | 8750.00 | 18 | 0.45 | 8750.00 | 18 | | |
| Castor | 0 | 0.00 | 0 | 6.1 | 17507.00 | 78 | 6.1 | 17507.00 | 78 | | |
| Taramira | 7.81 | 39050.00 | 180 | 0 | 0.00 | 0 | 7.81 | 39050.00 | 180 | | |
| Total | 1231.37 | 7197634.00 | 9556 | 640.44 | 6206215.00 | 1619 | 1871.81 | 13403849.00 | 11175 | | |



RC-101), gram (GG-2, GG-3, PKV-2, GG-4, RSG-888, GNG-1581, CSJ-515, GNG-1958, GNG-2144, GNG-2171, GNG-469, RSG-974, GNG-2173, Pratap channa-1, RSG-895 and RSG- 896), greengram (IPM 02-3, RMG-492, RMG-975, RMG-62, SML-668, Meha, GAM-5 and Co-4), pigeonpea (AGT-2, BDN-2 and Vaishali). State wise details are given in Table 12.3.

Cereals

The seeds of important varieties of different cereal crops were produced viz. barley (RD-2668, RD-2660, RD-2794, RD-2552, RD-2715, RD-2592, RD-2786 and RD 2715), paddy (PB-4(P1121), Pusa-1509, GR-7, Gurjari, IR-28, GR-7, GNR-4, Jaya, GNR-3, NAUR-1, Purna, GNR-2, GAR-13 and MTU-1010), wheat (Raj-4079, Raj-4120, Raj-3077, KRL-210, Raj-4238, Raj-4239, Raj-4037, Raj 4120, HD 3086, Raj. 4238, Raj. 4080, HI-8713, HD 2967, WH-1105, HD 2932, GW-1255, GW-451, GW-496, GW-1, GW-366 and GW-463). A total of 5891.74 q

1719.6

16003603.00

Total



Barley Seed production at KVK Dungarpur

seeds produced were provided to 8880 farmers valued Rs. 22871012. The state wise details are given in Table 12.4.

Vegetables

The KVKs of Gujarat undertook seed production of Indian bean during 2016-17. Total 27.9 g seed of Indian bean was produced with value of Rs. 186000. As per report 60 farmers procured quality seed of Indian bean from concerned KVKs.

| Pulses | Rajasthan | | | Gujarat | | | Total | | |
|------------|--------------|-------------|----------------|--------------|----------------|----------------|--------------|-------------|----------------|
| | Quantity (q) | Value (Rs.) | No. of farmers | Quantity (q) | Value (Rs.) | No. of farmers | Quantity (q) | Value (Rs.) | No. of farmers |
| Black Gram | 158.36 | 1619850.00 | 1355 | 45.76 | 497238.00 | 318 | 204.12 | 2117088.00 | 1673 |
| Chickpea | 1059.95 | 9353423.00 | 2069 | 28.92 | 227610.00 | 336 | 1088.87 | 9581033.00 | 2405 |
| Cowpea | 43.53 | 338290.00 | 355 | | | | 43.53 | 338290.00 | 355 |
| Green gram | 436.56 | 4503440.00 | 3633 | 112.4 | 1232100.00 | 1257 | 548.96 | 5735540.00 | 4890 |
| Moth bean | 21.2 | 188600.00 | 236 | | | | 21.2 | 188600.00 | 236 |
| Pigeon pea | | | | 94.89 | 1001318.00 | 1012 | 94.89 | 1001318.00 | 1012 |

Table 12.3 Seed production of different pulse crops

2958266.00

2923

2001.57

18961869.00

10571

281.97

7648



Table 12.4 Seed production of different cereal crops

| Cereals | Rajasthan | | | | Gujarat | | | Total | | | |
|---------|--------------|-------------|----------------------------|--------------|----------------|----------------------------|--------------|-------------|----------------------------|--|--|
| | Quantity (q) | Value (Rs.) | Provided to no. of farmers | Quantity (q) | Value (Rs.) | Provided to no. of farmers | Quantity (q) | Value (Rs.) | Provided to no. of farmers | | |
| Barley | 890.04 | 2120208.00 | 1288 | | | | 890.04 | 2120208.00 | 1288 | | |
| Paddy | 397.9 | 6712920.00 | 630 | 757.99 | 2153188.00 | 2982 | 1155.89 | 8866108.00 | 3612 | | |
| Wheat | 2943.26 | 9501859.00 | 2951 | 902.55 | 2382837.00 | 1029 | 3845.81 | 11884696.00 | 3980 | | |
| Total | 4231.2 | 18334987.00 | 4869 | 1660.54 | 4536025.00 | 4011 | 5891.74 | 22871012.00 | 8880 | | |

Spices

The seeds of important varieties of different spice crops were produced viz. coriander (ACr-1, RKD-18, RCR-436 and Guj.Co.-2), fenugreak (RMT-1, RMT-305, AFG 3, Ajmer Methi 3 and GM-2), cumin (GC-4), fennel (RF-205 and GF-12), Garlic (G-282). A total of 370.71 q seeds produced were made available to 2024 farmers with value Rs. 4900522. The state wise details are given in Table 12.6.

Fodder

The seeds of important varieties of different fodder crops were produced viz. Bajra Chari, Barseem (Bundel Barseem-2), lucern (Kuchi and Anand-2), oat (JHO-822, JHO-99-2, JHO-2004), sorghum (Gundri and MP chari). A total of 39.07q seeds produced were provided to 499 farmers valued Rs. 245245. The state wise details are given in Table 12.7.

Table 12.6 Seed production of different spices crops

| Spices | | Rajasthan | | | Gujarat | | Total | | | |
|-----------|--------------|----------------|----------------------------|--------------|----------------|----------------------------------|--------------|----------------|----------------------------|--|
| | Quantity (q) | Value (Rs.) | Provided to no. of farmers | Quantity (q) | Value (Rs.) | Provided to no. of farmers | Quantity (q) | Value (Rs.) | Provided to no. of farmers | |
| Coriander | 113.58 | 1683400.00 | 544 | 25.6 | 384000.00 | 182 | 139.18 | 2067400.00 | 726 | |
| Cumin | 4.47 | 100575.00 | 28 | 9.76 | 219600.00 | 122 | 14.23 | 320175.00 | 150 | |
| Fenugreek | 69.96 | 699600.00 | 652 | 1.8 | 18000.00 | 6 | 71.76 | 717600.00 | 658 | |
| Garlic | 138.97 | 1696717.00 | 257 | | | | 138.97 | 1696717.00 | 257 | |
| Fennel | 5 | 75000.00 | 168 | 1.57 | 23630.00 | 65 | 6.57 | 98630.00 | 233 | |
| Total | 331.98 | 4255292.00 | 1649 | 38.73 | 645230.00 | 375 | 370.71 | 4900522.00 | 2024 | |

22500.00

245245.00

10

499



| Fodder | Rajasthan | | | | Gujarat | | Total | | | |
|---------|--------------|----------------|----------------------------------|--------------|----------------|----------------------------------|--------------|----------------|----------------------------|--|
| | Quantity (q) | Value (Rs.) | Provided to no. of farmers | Quantity (q) | Value (Rs.) | Provided to no. of farmers | Quantity (q) | Value (Rs.) | Provided to no. of farmers | |
| Barseem | 1.75 | 35000.00 | 36 | 1.5 | 37500.00 | 75 | 3.25 | 72500.00 | 111 | |
| Oat | 13.6 | 76600.00 | 108 | 2.44 | 13697.00 | 41 | 16.04 | 90297.00 | 149 | |
| Lucerne | 0.45 | 11250.00 | 26 | 8.5 | 42500.00 | 139 | 8.95 | 53750.00 | 165 | |
| Napier | 10.33 | 6198.00 | 64 | | | | 10.33 | 6198.00 | 64 | |

93697.00

12.44

Table 12.7 seed production of different fodder crops

Commercial

Dhaman

Total

0.5

26.63

The seeds of important varieties of cotton and sugarcane were produced during 2016-17. Details are given in Table 12.8

22500.00

151548.00

10

244

Others

Besides above KVKs of Zone-VI have produced 124.565 q of other seeds including millets, sunhemp, dhanicha, and medicinal. Planting Material Production

Production of vegetables seedlings

KVKs of this zone produced large number of vegetable seedlings (5184190) viz. Bitter

gourd, Banga, Bottle gourd, Brinjal, Brocoli, Cabbage, Cauliflower, Chilli, Cucumber, Drumstick, Little gourd, Long melon, Muskmelon, Okra, Onion, Pumpkin, Ridge gourd, Tomato, Watermelon, Smooth guard, Sponge gourd, Sweet potato and Pointed gourd. A total of 5184190 seedlings were produced and provided to 11228 farmers (Rs. 1453048). The state wise details are given in Table 12.9.

0.5

39.07

255

Fruits

KVKs of Rajasthan and Gujarat produced large number of fruits saplings (272181) viz.

| Table 12.8 | 3 Seed | production of | f different | commercial | crops |
|-------------------|--------|---------------|-------------|------------|-------|
| | | | | | |

| Commercial | Rajasthan | | | | Gujarat | | Total | | |
|------------|--------------|----------------|----------------------------------|--------------|----------------|----------------------------------|--------------|----------------|----------------------------------|
| | Quantity (q) | Value (Rs.) | Provided to no. of farmers | Quantity (q) | Value (Rs.) | Provided to no. of farmers | Quantity (q) | Value (Rs.) | Provided to no. of farmers |
| Cotton | 12.68 | 253600.00 | 225 | 13.6 | 27200.00 | 32 | 26.28 | 280800.00 | 257 |
| Sugarcane | | | | 350 | 70000.00 | 18 | 350 | 70000.00 | 18 |
| Total | 12.68 | 253600.00 | 225 | 363.6 | 97200.00 | 50 | 376.28 | 350800.00 | 275 |



Table 12.9 Seedlings production of different vegetable crops

| Vegetables | Rajasthan | | | | Gujarat | | Total | | | |
|---------------|-----------|----------------|----------------------------|---------|----------------|----------------------------------|---------|----------------|----------------------------|--|
| | Number | Value (Rs.) | Provided to no. of farmers | Number | Value (Rs.) | Provided to no. of farmers | Number | Value (Rs.) | Provided to no. of farmers | |
| Bitter gourd | 369 | 2443.00 | 71 | 15974 | 63896.00 | 100 | 16343 | 66339.00 | 171 | |
| Banga | 20 | 140.00 | 1 | | | | 20 | 140.00 | 1 | |
| Bottle gourd | 3369 | 17723.00 | 149 | 1865 | 6527.50 | 20 | 5234 | 24250.50 | 169 | |
| Brinjal | 33328 | 33328.00 | 621 | 493564 | 287397.00 | 3816 | 526892 | 320725.00 | 4437 | |
| Brocoli | | | | 200 | 200.00 | 1 | 200 | 200.00 | 1 | |
| Cabbage | 10120 | 5130.00 | 224 | 12456 | 7126.00 | 112 | 22576 | 12256.00 | 336 | |
| Cauliflower | 67268 | 36084.00 | 327 | 14000 | 7680.00 | 57 | 81268 | 43764.00 | 384 | |
| Chilli | 245638 | 291920.00 | 1105 | 396247 | 244656.00 | 732 | 641885 | 536576.00 | 1837 | |
| Cucumber | 133 | 921.00 | 24 | 255 | 637.50 | 4 | 388 | 1558.50 | 28 | |
| Drumstick | | | | 10931 | 119160.00 | 863 | 10931 | 119160.00 | 863 | |
| Little gourd | | | | 3491 | 34910.00 | 70 | 3491 | 34910.00 | 70 | |
| Long melon | 104 | 728.00 | 27 | | | | 104 | 728.00 | 27 | |
| Muskmelon | 46 | 322.00 | 15 | | | | 46 | 322.00 | 15 | |
| Okra | 255 | 150.00 | 6 | | | | 255 | 150.00 | 6 | |
| Onion | 3496500 | 40365.00 | 195 | 11325 | 1650.00 | 43 | 3507825 | 42015.00 | 238 | |
| Pumpkin | 445 | 3115.00 | 121 | | | | 445 | 3115.00 | 121 | |
| Ridge gourd | 542 | 3786.00 | 112 | 1302 | 4557.00 | 10 | 1844 | 8343.00 | 122 | |
| Tomato | 56300 | 73200.00 | 809 | 193624 | 116664.00 | 1534 | 249924 | 189864.00 | 2343 | |
| Watermelon | 26 | 182.00 | 9 | | | | 26 | 182.00 | 9 | |
| Smooth gourd | | | | 13 | 195.00 | 1 | 13 | 195.00 | 1 | |
| Sponge gourd | | | | 330 | 1155.00 | 10 | 330 | 1155.00 | 10 | |
| Sweet potato | | | | 114000 | 45600.00 | 38 | 114000 | 45600.00 | 38 | |
| Pointed gourd | | | | 150 | 1500.00 | 1 | 150 | 1500.00 | 1 | |
| Total | 3914463 | 509537.00 | 3816 | 1269727 | 943511.00 | 7412 | 5184190 | 1453048.00 | 11228 | |

Ber, Aonla, Beal, Custard Apple, Citrus, Date palm, Dragon fruit, Fig, Grape, Guava, Jackfuit, Jamun, karonda, Lasoda, Malta, Mandarin, Mango, Mosambi, Mullbery, Pear, Papaya, Phalsa, Pomegranate, Orange, Sapota and Tamarind. Saplings produced were provided to 8276 farmers (Rs. 5773836). The state wise details are given in Table 12.10.



Table 12.10 Saplings production of different fruits crops

| Fruits Rajasthan | | | | | Gujarat | | Total | | | |
|------------------|--------|-------------|----------------|--------|-------------|----------------|--------|-------------|----------------|--|
| | Number | Value (Rs.) | No. of farmers | Number | Value (Rs.) | No. of farmers | Number | Value (Rs.) | No. of farmers | |
| Aonla | 548 | 11695.00 | 188 | | | | 548 | 11695.00 | 188 | |
| Ber | 10629 | 268425.00 | 406 | 281 | 19670.00 | 35 | 10910 | 288095.00 | 441 | |
| Beal | 2094 | 12555.00 | 145 | | | | 2094 | 12555.00 | 145 | |
| Custard Apple | 30 | 1260.00 | 9 | | | | 30 | 1260.00 | 9 | |
| Citrus | 68841 | 1169090.00 | 2331 | 6233 | 101575.00 | 259 | 75074 | 1270665.00 | 2590 | |
| Datepalm | | | | 30 | 450.00 | 2 | 30 | 450.00 | 2 | |
| Dragon fruit | | | | 26 | 2080.00 | 10 | 26 | 2080.00 | 10 | |
| Fig | 145 | 1792.00 | 38 | | | | 145 | 1792.00 | 38 | |
| Grape | 192 | 3855.00 | 79 | | | | 192 | 3855.00 | 79 | |
| Guava | 12360 | 343190.00 | 598 | 3079 | 39480.00 | 173 | 15439 | 382670.00 | 771 | |
| Jackfuit | 392 | 5660.00 | 30 | | | | 392 | 5660.00 | 30 | |
| Jamun | 1946 | 16040.00 | 250 | | | | 1946 | 16040.00 | 250 | |
| karonda | 5977 | 75110.00 | 219 | | | | 5977 | 75110.00 | 219 | |
| Lasoda | 668 | 11375.00 | 81 | | | | 668 | 11375.00 | 81 | |
| Malta | 5067 | 151960.00 | 118 | | | | 5067 | 151960.00 | 118 | |
| Mandarin | 12100 | 365559.00 | 307 | | | | 12100 | 365559.00 | 307 | |
| Mango | 6524 | 243700.00 | 557 | 7616 | 380245.00 | 239 | 14140 | 623945.00 | 796 | |
| Mosambi | 37 | 1850.00 | 21 | | | | 37 | 1850.00 | 21 | |
| Mullbery | 78 | 1270.00 | 13 | | | | 78 | 1270.00 | 13 | |
| Pear | 16 | 320.00 | 9 | | | | 16 | 320.00 | 9 | |
| Papaya | 120029 | 2350395.00 | 1504 | 863 | 8693.00 | 101 | 120892 | 2359088.00 | 1605 | |
| Phalsa | 79 | 1557.00 | 34 | | | | 79 | 1557.00 | 34 | |
| Pomegranate | 5876 | 163045.00 | 432 | | | | 5876 | 163045.00 | 432 | |
| Orange | 43 | 2150.00 | 9 | | | | 43 | 2150.00 | 9 | |
| Sapota | 105 | 6760.00 | 40 | 171 | 11970.00 | 30 | 276 | 18730.00 | 70 | |
| Tamarind | 106 | 1060.00 | 9 | | | | 106 | 1060.00 | 9 | |
| Total | 253882 | 5209673.00 | 7427 | 18299 | 564163.00 | 849 | 272181 | 5773836.00 | 8276 | |



Ornamental (Flower) crops

Large numbers of seedlinghs of ornamental crops produced by KVKs of this zone (68278) during the year were provided to 2839 farmers (Rs. 437420/-). The state wise details of crops, number of saplings, value and procured by farmers are given in Table 12.11.

Fodder crops

Majority of KVKs produced Napier grass (Co-4) variety and the details are given in Table 12.12.

Forest plants

Different forest plants produced by KVKs of Rajasthan and Gujarat (2314) during the year (2016-17) were provided to 467 farmers (Rs. 111530/-).

The state wise details of crops, number of plants, value and procurement by farmers are given in table 12.13.

Table 12.11 Sapling production of different ornamental crops

| Ornamental | Rajasthan | | | | Gujarat | | Total | | | |
|---------------|-----------|-------------|----------------|--------|-------------|----------------|--------|-------------|----------------|--|
| | Number | Value (Rs.) | No. of farmers | Number | Value (Rs.) | No. of farmers | Number | Value (Rs.) | No. of farmers | |
| Acalifa | | | | 50 | 500.00 | 1 | 50 | 500.00 | 1 | |
| Adenium | | | | 25 | 500.00 | 6 | 25 | 500.00 | 6 | |
| Bogunvellia | 12 | 185.00 | 7 | | | | 12 | 185.00 | 7 | |
| Champa | 354 | 3540.00 | 61 | 25 | 250.00 | 13 | 379 | 3790.00 | 74 | |
| Carpet grass | 27 | 1350.00 | 13 | | | | 27 | 1350.00 | 13 | |
| Chandni | 879 | 4535.00 | 90 | | | | 879 | 4535.00 | 90 | |
| Chrysenthimum | 369 | 7360.00 | 27 | | | | 369 | 7360.00 | 27 | |
| Duranta | 1205 | 8140.00 | 29 | 2650 | 1040.00 | 8 | 3855 | 9180.00 | 37 | |
| Dahelia | 71 | 1420.00 | 10 | | | | 71 | 1420.00 | 10 | |
| Gurhal | 905 | 11820.00 | 177 | 10 | 100.00 | 2 | 915 | 11920.00 | 179 | |
| Fanpalm | | | | 1 | 20.00 | 1 | 1 | 20.00 | 1 | |
| Kesar | 18 | 180.00 | 7 | | | | 18 | 180.00 | 7 | |
| Kachnar | 100 | 1000.00 | 24 | | | | 100 | 1000.00 | 24 | |
| Kaner | 2878 | 116035.00 | 789 | | | | 2878 | 116035.00 | 789 | |
| Marigold | 16368 | 10700.00 | 83 | 18610 | 33430.00 | 17 | 34978 | 44130.00 | 100 | |
| Mogra | 763 | 8010.00 | 185 | | | | 763 | 8010.00 | 185 | |
| Morpankhi | 50 | 1000.00 | 34 | | | | 50 | 1000.00 | 34 | |
| Rose | 22885 | 225825.00 | 1249 | 23 | 480.00 | 6 | 22908 | 226305.00 | 1255 | |
| Total | 46884 | 401100.00 | 2785 | 21394 | 36320.00 | 54 | 68278 | 437420.00 | 2839 | |



| Fodder | | Rajasthan | | | Gujarat | | Total | | |
|-----------------------------|--------|-------------|----------------|--------|-----------|----------------|--------|-------------|----------------|
| | Number | Value (Rs.) | No. of farmers | | | No. of farmers | Number | Value (Rs.) | No. of farmers |
| Napier | 6932 | 34660.00 | 34 | 385700 | 385700.00 | 226 | 392632 | 420360.00 | 260 |
| Perrenial grass tussocks | | | | 1600 | 1600 | 8 | 1600 | 1600 | 8 |
| Total | 6932 | 34660.00 | 34 | 387300 | 387300.00 | 234 | 394232 | 421960.00 | 268 |

Table 12.13 Saplings production of different forest crops

| Forest | | Rajasthan | | | Gujarat | | | Total | | | |
|----------|--------|----------------|----------------------------|--------|-------------|----------------------------------|--------|-------------|----------------------------|--|--|
| | Number | Value (Rs.) | Provided to no. of farmers | Number | Value (Rs.) | Provided to no. of farmers | Number | Value (Rs.) | Provided to no. of farmers | | |
| Bargad | 400 | 26000.00 | 75 | | | | 400 | 26000.00 | 75 | | |
| Gulmohar | 5 | 50.00 | 3 | | | | 5 | 50.00 | 3 | | |
| Neem | 729 | 34980.00 | 195 | | | | 729 | 34980.00 | 195 | | |
| Sagon | 400 | 4000.00 | 22 | | | | 400 | 4000.00 | 22 | | |
| Shisham | 675 | 43875.00 | 170 | | | | 675 | 43875.00 | 170 | | |
| Simaruba | 105 | 2625.00 | 2 | | | | 105 | 2625.00 | 2 | | |
| Total | 2314 | 111530.00 | 467 | | | | 2314 | 111530.00 | 467 | | |

Medicinal crops

Saplings of different medicinal crops produced by KVKs of this zone (45205) during the year were made available to 222 farmers (Rs. 182490). Production of saplings of medicinal crops were reported only in Rajasthan, details of crops, number of saplings, value and procurement by farmers are given in Table 12.14.

Other crops

Planting materials of other crop like Tobacco produced by KVKs of Gujarat (52600) during the year were procured by 9 farmers with value of Rs. 8460.

Production of Bio-products

In this zone, 25 KVKs produced a total of 212756.8 kg of bio-products of Rs. 4994721 and same were distributed amongst 12897 farmers. Time to time, it included mainly bio-agents viz. Fruit fly traps (1810) Trichoderma (22121 kg) and vermiculture (5513.33). Beside this KVKs also produced bio-fertilizers viz. Azolla (1490 kg), Azotobactor (471 kg), PSB (853.4 kg), Rhizobium (641.6 kg) NPK (350) Vermicompost (162858 kg) and Bio-pesticides viz. Beauveria (18721 kg), NPV (87.5 kg). The details of zone are given in Table 12.16.

| (| | |
|---|------|--------|
|) | ICAR | - ATAR |
| | | |

Table 12.14 Saplings production of different medicinal crops

| Medicinal | nal Rajasthan | | | | Gujarat | ; | Total | | | |
|-----------|---------------|----------------|----------------------------------|--------|-------------|----------------------------------|--------|----------------|----------------------------|--|
| | Number | Value (Rs.) | Provided to no. of farmers | Number | Value (Rs.) | Provided to no. of farmers | Number | Value (Rs.) | Provided to no. of farmers | |
| Aloevera | 45196 | 182400.00 | 214 | Nil | Nil | Nil | 45196 | 182400.00 | 214 | |
| Tulsi | 9 | 90.00 | 8 | Nil | Nil | Nil | 9 | 90.00 | 8 | |
| Total | 45205 | 182490.00 | 222 | Nil | Nil | Nil | 45205 | 182490.00 | 222 | |

Table 12.16 Bio-products produced by KVKs of Zone-VI

| Bio Products | Name of the bio-product | Quantity (No.) | Quantity Kg | Value (Rs.) | No. of Farmers |
|---------------------|-------------------------|----------------|-------------|-------------|----------------|
| Bio Agents | Fruitfly trap | 1810 | 0 | 63070.00 | 124 |
| | Trichoderma | | 22121.00 | 1489620.00 | 4493 |
| | Vermiculture | | 5513.33 | 656930.00 | 868 |
| | Total | 1810 | 27634.33 | 2209620.00 | 5485 |
| Bio-fertilizer | Azolla | | 1490.00 | 85800.00 | 696 |
| | Azotobactor | | 471.00 | 34430.00 | 624 |
| | NPK | 350 | | 70000.00 | 200 |
| | PSB | | 853.40 | 80800.00 | 1160 |
| | Rhizobium | | 641.60 | 50140.00 | 826 |
| | Vermi compost | | 162858.00 | 1065171.00 | 932 |
| | Total | 350 | 166314.00 | 1386341.00 | 4438 |
| Bio-pesticide | Beauveria | | 18721.00 | 1355010.00 | 2624 |
| | NPV | | 87.50 | 43750.00 | 350 |
| | Total | | 18808.50 | 1398760.00 | 2974 |
| | Grand Total | 2160 | 212756.80 | 4994721.00 | 12897 |

Livestock production

KVKs of Rajasthan and Gujarat produced 15297 quality animals of cows, bull, heifer, goat bucks, goat doe, sheep rams, poultry chicks, poultry cocks, poultry hens, and poultry eggs.

Besides of these KVKs produced 275 fishes of IMC. A total of 1081 farmers procured from KVKs during 2016-17. The details of zone are given in Table 12.17.



Table 12.17 Production of livestock materials

| Particulars of Live stock | Name of the breed | Number | Value (Rs.) | No. of Farmers |
|---------------------------|-------------------|--------|-------------|----------------|
| Dairy animals | | | | |
| Cattle | | | | |
| Bull | Tharparker | 6 | 11000.00 | 5 |
| | Gir | 3 | 150000.00 | 3 |
| Cow | Jersey | 4 | 51500.00 | 4 |
| | Jersy Cross | 3 | 100556.00 | 2 |
| | Gir | 7 | 234000.00 | 6 |
| | HF Cross | 7 | 202354.00 | 6 |
| | Kankrej | 1 | 50256.00 | 1 |
| Heifer | HF Cross | 12 | 180000.00 | 8 |
| | Gir | 14 | 120000.00 | 12 |
| Goat | | | | |
| Buck | Sirohi | 43 | 382000.00 | 34 |
| | Zalavadi | 1 | 7000.00 | 1 |
| Doe | Sirohi | 602 | 4835000.00 | 261 |
| | Zalavadi | 1 | 8000.00 | 1 |
| Sheep | | | | |
| Ram | Kendrapada | 9 | 30000.00 | 5 |
| Poultry | | | | |
| Poultry Chicks | Pratapdhan | 14200 | 5214582.00 | 635 |
| Poultry Cock | Pratapdhan | 2 | 1000.00 | 2 |
| Poultry Eggs | Pratapdhan | 380 | 2214.00 | 91 |
| Poultry Hean | Pratapdhan | 2 | 800.00 | 1 |
| Total | | 15297 | 11580262.00 | 1078 |
| Fishery | IMC | 275 | 2000.00 | 3 |



Distribution of Pratap Dhan Chicks by Hon'ble VC in Farmers scientist Interaction



Distribution of Rabbit to farmers under TSP KVK, Dungarpur





SUCCESS STORIES

Enhancement of Income through Quality pulse Seed Production

KVK-Surendranagar, Gujarat

Situation analysis/Problem statement

Chickpea (Cicer arientinum L.) commonly known gram or Bengal gram is the most important pulse crop of India. It is grown in about 9.00 million ha of major states viz. M.P., Maharashtra, U.P., Rajasthan, Andhra Pradesh, Gujarat, Karnataka, Bihar, Chhatisgarh etc. It is used for human consumption as well as for feeding to animals. It is eaten both whole fried or boiled and salted or more generally in the form of split pulse which is cooked and eaten. Both husks and bits of the 'dal' are valuable for cattle feed. Fresh green leaves are used as vegetable (Sag). Straw of chick pea is an excellent fodder for cattle especially for goats. The grains are also used as vegetable (chhole). Chickpea flour (besan) is used in the preparation of various types of sweets. Chickpea is considered to have medicinal effects and it is used for blood purification. Chickpea contains 21.1 per cent protein, 61.5 per cent carbohydrates, 4.5 per cent fat. It is rich in calcium, iron and niacin.

In Karmad village of Surendranagar district, major crops grown in Kharif are cotton, sesamum and bajara and in rabi season, wheat, cumin and chickpea crops. Farmers' generally cultivate chickpea by using old deteriorated seed of old varieties. The farmers are not fetching the good remuneration due to low yield of the crop. Mostly local varieties are used and which are also infested by wilt and root rout disease so this crop is not profitable in consideration of farmer. In last decades they grew gram crop for home consumption only.

In last five years, there is high demand of green chick pea in the markets of Gujarat for vegetable purpose, then farmers have started cultivation of Gram as a profitable crop with in short span of time.

Plan, Implement and Support

Farmers of Karmad village of Surendranagar district came in the contact with KVK Scientist, Mr. Poona bhai and his group of farmers frequently visited at KVK farm. After long discussion during PRA studies and interest of farmers, their dynamics to Agriculture In the year 2015-16, KVK, JAU, Surendranagar had provided chickpea seed of improved variety GJG-3 under NFSM Cluster FLD for 20 ha area and covered 50 farmers. All the farmers were well trained before giving the inputs for FLDs under this programme. KVK scientists also closely associated about the crop situations and frequently visited in village and overall effect was seen during the fieldday organized at village level.

Farmers other than FLD also visited FLD sites during the standing crop period and field day, farmer meeting at FLD field site and were impressed with the performance of this improved variety and other packages.

Output

The performance of GJG-3 variety along with all other components was found quite satisfactory. over local check. On an average yield of improved varieties is 20-25 percent higher than the local. This variety is rated as large seeded so the farmers are demanding for green pods for



vegetable. According to demand and future, scientist advised to villagers to keep the seed of this variety to provide seed to the local farmers.

Outcome

After seeing the performance of this variety, many farmers of this village and from neighboring villages sought the seed demand from FLD farmers for next coming season as seed (for the rabi 2016 - 17). Looking to this, farmers stored properly seed of variety for selling as seed

for next season and provided it to the needy farmers as seed input. This action not only fetched good price for them but it also ensured the availability of good quality seed at their locality with less price as compared to market. They sold their chickpea seed @Rs. 11000/- to 13000/- per quintal. While in this process both the seller and buyer farmers got benefited. Approximately 6000 kg seed material was sold by 143 farmers. Details are given below:

| Sr. No. | Name of Village & Address | Name of Crop | Crop Variety | Quantity sold as seed (in qtl.) | Price fetched (In Rs./qtl) | Market price of local chickpea at that time (Rs/q) | Total difference in term of profit fetched by intervention (Rs.) | Net profit realized by farmers (Rs.) |
|------------|---|-----------------|-----------------|--|-------------------------------------|--|--|--|
| 1 | Village : Karmad Taluka : Chuda, Surendranagar (Guj.) | Chickpea | GJG-3 | 60.00 | 11000.00 | 8000.00 | 3000.00 | 180000.00 |

Impact:

Now with in short span of time Karmad village has become popular for good quality of seed of Gram. In current year again farmer grew

seed of GJG-3 variety of chickpea at their farms and seeing the better performance of crop during rabi 2016-17, farmers have kept seeds of chickpea on large scale.



Field day Organized at Karmad Village





Traning Programme at Karmad Village



Farmers Drying their seed for next crop

Ecological Sustainability through Rain Water Harvesting and Micro Irrigation System

KVK-Kutch-I, Gujarat

Introduction

Kutch is the second largest district in India after Ladakh. It covers about one fourth part of the Gujarat state. Major portion of this district has arid and semi-arid climate. Summer is too hot and winter is dry and cold. Monsoon is very short and irregular. Average annual rainfall in the district is only 360 mm with 13 average rainy days. Drought is very common phenomenon of the district. Salinity is the foremost problem both in soil and water. Only 12% of total cultivated area has irrigation facilities. Cotton, Castor, Sesamum, Groundnut, Sorghum, and Pearl millet are the major seasonal crops and Datepalm, Sapota and Mango are the major horticultural crops.

Major source of irrigation is bore well. The ground water is reducing day by day due to heavy withdrawal of water. Salinity in ground water is increasing rapidly due to sea water ingression. Looking to the situation, KrishiVigyan Kendra, Mundra –Kutch decided to develop and popularize rain water harvesting structure for judicious use of irrigation water.

Situation analysis

Krishi Vigyan Kendra, Mundra – adopted a Bhalot village to implement the programmes of the project – "National Innovations in Climate Resilient Agriculture" (NICRA). The source of irrigation water in Bhalot village is open well. Irrigation facility in the field crops is only limited during good rainfall year. Before five years hardly 150 open wells were there but open wells have no enough irrigation water due to lack of rain water harvesting structure. Farmers of Bhalot village were not in a position to grow even single season crop properly. Economic conditions of the farmers' were very poor due to this problem. There was not a single drip set in the village. Hence, unavailability and inefficient use of irrigation water was the main cause for the limited crop area under irrigation.

Plan, Implement and Support

In 2011 Krishi Vigyan Kendra, Mundra-Kutch selected this village under NICRA activities. During PRA survey, KVK analysed the situation and decided to implement rain water harvesting work. It was decided to prepare small Check dams on different water streams, farm bunding, well recharging, deepening of old ponds, etc. To implement this work, convergence with NGOs, DWDU (District Watershed Development Unit) and other agencies was developed.

- Under NICRA project two small Check dams were established. Moreover, other small size 15 check dams were prepared by support of other agencies.
- Five well recharging models were prepared on different wells.
- Total 10 old check dams were renovated and desilted in NICRA project by people's



participation mode.

- Three ponds were desilted and water storage capacity was increased (by NICRA, DWDU and peoples' contribution).
- KVK had created awareness among farmers regarding efficient and proper use of water by use of Drip Irrigation System. Farmers were also promoted and linked with subsidy of Gujarat state Government. As a result, 85 farmers adopted drip irrigation in 105 ha area.

Output

As a result of KVK activities for rain water harvesting, farmers started to prepare new

wells for irrigation. Presently more than 250 open wells are fully functional for irrigation. Open wells were recharged and water level raised up to 20 ft (from surface level) during good monsoon.

In spite of enough water in open wells, farmers were able to irrigate only one season crop, due to inefficient use of water. KVK has developed a model regarding efficient and proper use of water by use of Drip Irrigation System. KVK under NICRA project provided little financial support to the farmers to install drip irrigation system. As a result of these activities, area under irrigation has been increased in the village. 85 farmers have



Rain Water Harvesting Structure



Recharged Open Well



Well Recharge Model



Desilting of Checkdam





Deepening of pond

adopted drip irrigation in 105 ha area. Farmers are now able to grow more than one season crops with same water. Average increase in cotton yield in the village with proper use of drip irrigation is 26%. Area covered under irrigation is just double than the previous irrigated area.

Significant output with percent increase

- Almost 42 open wells were added within last two years
- Ground water level has been raised by 3 to 6 meter.
- Water in 5 open wells are overflowing during monsoon.
- Farmers were earlier giving only two to three irrigations to crops during only kharif



Installation of Drip Irrigation System

season. Today farmers are growing kharif and rabi season crops also.

- Earlier, pre monsoon sowing of Bt. Cotton was not possible because of less quantity of water in open well. But during 2014-15, 65 farmers could grow Bt. Cotton in 80 ha area before monsoon.
- Area under Castor and Bt. Cotton increased after adoption of drip irrigation. Almost 62 ha area of Cotton and 81 ha area of Castor is increased due to drip irrigation.
- Total 148 ha area under irrigation is increased due to different rain water harvesting work and efficient use of irrigation water.
- Total rainfall during 2014-15 was very less (375 mm). It was 145 mm less as compared









| Season | Area under Irrigatio MIS Ar | Increase under irrigation (Area ha) | |
|--------|--------------------------------|-------------------------------------|-----|
| | Before work | After work | |
| Kharif | 310 | 430 | 120 |
| Rabi | 45 | 160 | 115 |
| Summer | 0 | 12 | 12 |
| Total | 355 | 602 | 247 |

to average annual rainfall of last decade of the district. Irrigation water in open well was very less. Even though, farmers got success to grow Bt. Cotton in 42 ha area, Castor in 23 ha area and vegetable in 6 ha area. Those farmers who have no drip system could not successfully produce Castor crop.

- 14 farmers could grow fodder crop even in Summer 2015.
- 3 farmers have grown Pomegranate under drip irrigation. Earlier, there was not a single farmer adopted fruit crop plantation.

Thus, 247 ha area under irrigation has been increased mainly creation of rain water harvesting work.

Outcome

- Value of crop produced from additional 247
 ha is about Rs. 148 lakh in the village which
 has been increased bu creation of Rain Water
 Harvesting Work.
- Average 25% yield of Bt. Cotton was increased in last 2 years due to drip irrigation (80 ha area of Bt. Cotton under drip irrigation during 2014-15).
- Total 480q Cotton production increased with proper use of drip system in the village. The

total value is Rs. 19.20 lakh.

- Additional 1550q Cotton & Castor production was increased with expansion of additional area under irrigation. The value is Rs. 62.00 lakh.
- Thus, annual income of the village farmers has been increased by Rs. 81.20 lakh from only Cotton & Castor crop due to drip irrigation.

Economic gain

- (i) Increase in crop productivity: Almost 5.9 q Cotton yield/ha was increased under drip as compared to without drip system. It gave Rs. 22,000 additional income per ha. to the farmers.
- (ii) Reduction in labour cost: about 50% labour cost was reduced in irrigation labour, weeding labour, fertilizer and pesticide application labour.

Rs. 4,500 per ha labour cost was saved under drip irrigation. Thus, total economic gain per ha. is Rs. 26,500 under drip irrigation in cotton in Bhalot village.

Impact

Earlier Irrigation facility in the field crops is only limited during good rainfall year and



hardly 150 open wells were there for irrigation and majority of open wells were not enough water because of lack of rain water recharging. Farmers of Bhalot village were not in a position to grow even single season crop properly. Economic conditions of the farmers' were very poor under this situation. There was also not a single drip set in the village.

After intervention of KVK regarding rain water harvesting and micro irrigation system 247 ha area have been covered under irrigation and value of crop produced increased due to additional 247 ha is about Rs. 148 lakh in the village. Almost 42 open wells have been increased and underground water level has been

raised by 3 to 6 meter due to rain water harvesting. Farmers were earlier giving only two to three irrigations to crops during only kharif season. Today farmers are growing kharif and rabi season crops also. Now almost100% farmers are adopting drip irrigation system in their fields in adopted village.

Looking to the success and effect of Rain Water Harvesting & Micro Irrigation System, farmers of surrounding villages have now started to adopt the technologies. More than 300 ha area under MID is covered in nearly surrounding villages (Lifra, Bagada, Waghura, Fachariya).

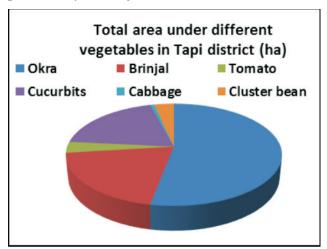
IPM Technology - A Boon for Ecofriendly Pest Management in Brinjal

KVK Tapi, Gujarat

Situation analysis/Problem statement

Insect pests are considered as important biotic stresses which results in poor yield and also destabilize brinjal production year after year. The tropical warm and humid climate prevalent in the country is very favourable for insect diversity and abundance. Insect pest infestation is one of the most limiting factor for accelerating yield potential of brinjal and is one of the major constrains in the brinjal production. Brinjal is prone to damage by more than 36 insect pests from the planting till the harvest (Ragupathy et al., 1997). In Gujarat, it is cultivated over 76,000 ha with an annual production of 14,77,000 metric tonnes (Indian Horticulture Database, 2015). In Tapi district of south Gujarat ecosystem, total area under vegetable crop is 22097 ha. Brinjal is the second important vegetable crop after okra. It contributes 17 % area (3715 ha) of vegetables in Tapi district. Under South Gujarat condition upto 5.76 per cent shoots and 47.67 per cent fruits were observed to be infested by the pest (Patel, 1992). While, up to 71.70 per cent fruit damage by brinjal shoot and fruit borer is reported by Shah et al. (1984).

In view of growing concern among the public for pesticide contamination along with gaining popularity of organic farming, adoption of eco-friendly methods of pest management in vegetable crops like brinjal has become very important. This has become more relevant in brinjal where harvesting or picking is done at weekly or shorter interval. This would also enable less or no insecticide residue in farm produce above detectable level. So, keeping this in consideration, role of Integrated Pest Management (IPM) becomes more relevant particularly in brinjal.



Plan, Implement and Support

The entry point visit to the adopted villages was made by the team of Subject Matter Specialists. To find out the technological adoption gaps and to identify the thrust areas for the agricultural development, in-depth survey by using Participatory Rural Appraisal tools was done. During PRA survey of adopted villages, it was found that knowledge regarding technological package. Tribal farmers are expending huge budget on crop production, indiscriminating use of agro-chemical and



disturbing the health of soil, water and environment and also unable to get higher net return mainly due to lack of knowledge and skill regarding value addition and market management. During interaction it was also found that for management of insect pests of brinjal, farmers solely depend upon chemical pesticides. They were not aware about the identification of pests of brinjal, their life cycle, nature of damage etc. For management of insect pests of brinjal, they have used health hazardous chemical pesticides injudiciously and indiscriminately. Moreover, it was very interesting to notice that most of the vegetable (okra & brinjal) growing farmers have not consumed vegetables grown by them. As they all know about the pesticide load done by themselves on vegetables for management of pests and diseases.

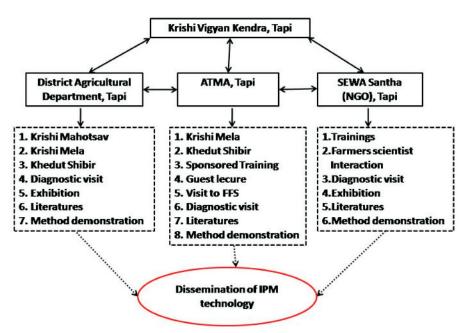
By considering this, Krishi Vigyan Kendra, Tapi has made an effort to promote and popularize IPM technology through various extension activities in different villages of Tapi district. In context to same, Subject Matter Specialist (Plant Protection) arranged training programmes (on/off) to enhance knowledge and upgrade skills about "Integrated Pest Management" among farmers. During training programmes, emphasis was given on 'Pesticide Residues' in different crops and shared experience with farmers about the different components of IPM viz., cultural practices, mechanical and physical practices; use of botanical pesticides, biological agents and application of chemical pesticides.

Subsequently, IPM kits comprising of

yellow sticky traps, pheromone traps with Leucinelure, Neem based Azadirachtin 1500 ppm and Trichocards were demonstrated at each selected farmers as critical input under FLDs (Table 1). Consequently, method demonstrations were also carried out for operation and installation of yellow sticky traps, pheromone traps, Trichocards etc. Moreover, the other nonpesticidal practices such as clean cultivation, collection and destruction of infested shoots and fruits, growing marigold as trap crops, ecological engineering in pest management were also carried out with active involvement of farmers'. Constant follow up visits, FLD meeting, FLD visit, field day and other extension activities were organized. The advice about need based pesticide application (based on the ETL level) was also given during field visit. Initially, farmers were hesitating to apply need based application of single pesticides and other IPM components but with constant encouragement, KVK scientists are successful in building up confidence in them. Scientist (Plant Protection) also advocated farmers about the identification of insect pests, bioagents and their life stages. The details of trainings, FLDs, cost of cultivation and economics are given below.

Moreover, dissemination of IPM technology in vegetables were also carried out in association with ATMA project, District Agricultural Departments through various extension activities [Sponsored training, Farmers Field Schools (FFS) visit, diagnostic visit, method demonstration, distribution of literature, mega events viz, Krishi Mahotsav, Krishi Melas, Khedut Shibir etc.]





Collaboration with other Departments/NGO's

Table 1: Details of FLD (Technology-IPM in Brinjal) conducted during 2013-14 to 2015-16

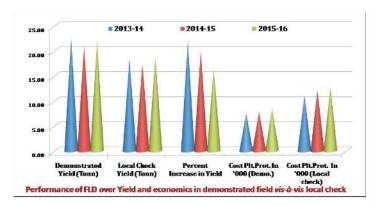
| Sr No | Year | Area (ha) | Name of the village | No. of farmers | Critical inputs d & other a | | | |
|----------|---------|--------------|--|----------------|--|--|--|--|
| | | | | | Direct benefit (critical Inputs dissemination) | Indirect benefit (other advisories) | | |
| 1 | 2013-14 | 3 | Ucchamala, Vaskoi, Vadpada (U), Bahida Raipura, Bedvan Bhesroth | 10 | lures, Yellow Sticky Traps, Neem kernel based Azadirachtin | Clean cultivation, Mechanical removal of infested shoot and fruits by BSFB, | | |
| 2 | 2014-15 | 3 | Bhadbhunja | 12 | 0.15%, Pseudomonas, | installation of bird perches | | |
| 3 | 2015-16 | 3 | Dhat, Chikhalda, | 12 | | P | | |

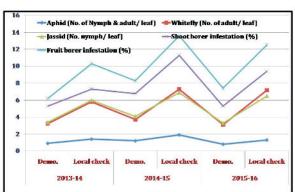
Table 2: Performance of yield and economics of demonstrated field vis-à-vis local check

| Sr. | Year | Den | no. Yield q | /ha | Yield of | Increase | Cost of Plant Protection | | |
|-----|---------|--------|-------------|--------|---------------------|-----------------|---------------------------------|-------------------------|--|
| | | Н | L | A | Local Check q/ha | in Yield (%) | Demo. (Rs./ha) | Local Check (Rs./ha) | |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | |
| 1 | 2013-14 | 230.25 | 219.65 | 226.45 | 185.65 | 21.98 | 7500.00 | 11150.00 | |
| 2 | 2014-15 | 215.6 | 206.3 | 210.4 | 175.3 | 20.02 | 7850.00 | 12270.00 | |
| 3 | 2015-16 | 232.2 | 210.3 | 219.4 | 188.65 | 16.30 | 8425.00 | 12750.00 | |



| Year | | e Cost of on (Rs./ha) | _ | Average Gross Return (Rs./ha) Average Net Return (Profit) (Rs./ha) | | | B:C Ratio | |
|---------|-----------|--------------------------|-----------|--|-----------|----------------|-----------|----------------|
| | Demo. | Local Check | Demo. | Local Demon. Check | | Local Check | Demon. | Local Check |
| 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
| 2013-14 | 105000.00 | 115000.00 | 339675.00 | 278475.00 | 234675.00 | 163475.00 | 3.24 | 2.42 |
| 2014-15 | 109000.00 | 120000.00 | 315600.00 | 262950.00 | 206600.00 | 142950.00 | 2.90 | 2.19 |
| 2015-16 | 74400.00 | 86800.00 | 219400.00 | 188650.00 | 145000.00 | 101850.00 | 2.95 | 2.17 |





Performance of IPM technology

Output

During 2013-14, 2014-15 and 2015-16 average yield obtained from demonstrated plot was 226.45 q/ha, 210.4 q/ha and 219.4 q/ha as compared to local check 185.65 q/ha, 175.3 q/ha and 188.65 q/ha, respectively (Table 2). The per cent increase in yield was 21.98%, 20.02% and 16.03% during 2013-14, 2014-15 and 2015-16, respectively. The B:C ratio obtained from demonstrated plot was also found higher (3.24, 2.90 and 2.95) than local check (2.42, 2.19 and 2.17) during three consecutive years (Table 2).

Outcome

In IPM technology, number of pesticide spray has been decreased up to 45% and it is helpful in conserving natural enemies. By the principle of 'Seeing is believing', other neighboring farmers visited to demonstrated IPM fields and made enquiry about the plant protection measures viz., pheromone traps, yellow sticky traps, trichocards etc. and also their source of accessibility. Interesting thing is that, demand for pheromone traps, yellow sticky traps and other botanical pesticides from neighboring farmers has also been increased.



| Sr No | Year | Technology demonstrated | Details of popularization methods suggested to the Extension system | Horizontal spread of technology | | |
|----------|---------|-------------------------|---|---------------------------------|----------------|---------------|
| | | | | No. of villages | No. of farmers | Area in ha |
| 1 | 2013-14 | IPM | Training, FLDs, FLD Visit, Diagnostic visit, Method demonstrations, Farmers Scientist Interaction, Field day, Collaborative work with other | 20 | 90 | 32 |
| 2 | 2014-15 | | department viz., ATMA, DAO, NGO's- Sponsored training, Krishi Mahotsav, Khedut shibir, Diagnostic visit, Method demonstrations, visit to FFS, Exhibition etc. | 18 | 115 | 38 |
| 3 | 2015-16 | | demonstrations, visit to 115, Exhibition etc. | 21 | 123 | 42 |

The farmers from neighboring villages were also attracted and associated with the KVK for adopting IPM technology.

IPM is an eco-friendly pest management approach which not only reduces the cost of plant protection, but also promises higher yield. IPM also helps in reducing the pesticide load from 15 sprays to 7 sprays. Farmers were successful in keeping off the pest incidence below ETL with the advanced guidance provided by KVK scientists is the major achievement of the demonstrations.

Impact

Due to concerted efforts, regular contact, constant follow up, motivation and effective communication of Scientists of Krishi Vigyan Kendra, Tapi; the area under brinjal cultivation with IPM technology has been increased significantly. Livelihood of the partner farmer and neighboring farmers has been found quite improving and satisfactory.





"Fruit fly trap" - An eco friendly tool to enhance the quality of mango in tribal area of South Gujarat

KVK-Valsad, Gujarat

Situation analysis/Problem statement

Situated in south eastern part of Gujarat, Valsad district, predominantly a tribal district is famous for its quality horticultural produce like mango, sapota and banana. Mango -the king of fruits is a leading fruit crop of our country. Gujarat has been known for producing high quality Alphanso and Kesar variety of mango. Particularly, Valsad district of South Gujarat is well known for its world famous variety Alphanso. Looking to the potentiality of quality mango fruits and vegetables production, Government has declared this region as Agri Export Zone (AEZ). The district has covered 46% of the total area under mango cultivation i.e. 26250 ha, with total Production of 157500 tones accounting productivity of 6000 kg/ha. The area under mango cultivation shows increasing trends but the productivity remain static. Quality of the mango is another aspect which needs to be addressed.

The Valsad district falls under Agro climatic zone I (South Gujarat heavy rainfall zone) of Gujarat which consists of two distinct agro-ecological situations viz; AES I and II. AES-I comprises of Dharampur and Kaprada talukas, while AES-II comprises of Valsad, Pardi, Umargam and Vapi talukas of Valsad district. The soil of the district in general is shallow to medium black with poor fertility status and having low moisture retention capacity. The average annual rainfall of the

district ranges between 2000 to 2200 mm, spread over an average of 87 rainy days in a Year. The maximum temperature ranges between 35° to 41° C during April – May. The lowest temp (8.1° to 8.6° C) observed during December-January.

Plan, Implement and Support

It is observed that particularly in tribal area of Valsad district, mango growers are facing vulnerable cause of attack of fruit fly in the ripening stage of mango. The fruitfly is considered as a main pest as it is a major constraint in the export of mango fruits. There are about 170 species of fruit fly in India. In Gujarat, Bactrocera and Dacus are the main genera of fruit fly. In South Gujarat, the Mango is mainly damaged by Bactrocera correctus and Bactrocera dorsalis. The female adult puncture the fruit and lay eggs into it and the larva emerging from the eggs cause damage to the fruit, as a result brown rotten patch appears on the fruit surface. Infested fruits finally fall on the ground. The population of fruitfly is found more during April to August. Thus, it does not only reduce the volume of produce but also it deteriorate fruit quality resulting into great economic losses to the mango growers.

Many research workers have suggested different management methods such as collection and destruction of flies/damaged fruits, deep ploughing, chemosterilants,









Female Adult fruit fly

Damage caused by fruit fly

Damaged fruit of mango

irradiation, chemical control, sex pheromones etc. Using chemical for the management of fruit fly creates problem of residual effect of chemicals on fruit. Even exporters /importers do not allowed farmers to use such chemical. Hence, sex pheromones are very useful, eco friendly and cheaper tool to management fruit fly in mango orchard.

Fruit fly (Methyl Euginol) Trap : The Technology

State Agriculture University, Navsari has developed a low cost and eco-friendly technology of fruit fly trap which is easier and safe way to check the population of fruit fly in mango orchard. The low cost fruit fly traps are developed by the research scientist using sex pheromone i.e. Methyl Euginol. The trap is designed in such a manner that the sex pheromone on the sponge/ card board piece

(plywood block) attracts male fruit fly and Dichlorvos kills them which reduces the fruit fly population of next generation. The recommendation for mango crop is @ 10 traps per ha during fruit development stage.

Advantages of the technology:

- The cost of a trap is only Rs. 30-35. It is a cheaper technology.
- It reduces the use of pesticides and hence, eco friendly.
- It reduces the cost of pesticides and also cost of spraying.
- Trap can be prepared from locally available resources such as plastic bottle and sponge by the farmers.
- Very easy to handle the trap.
- It can be used repeatedly.





Fruitfly trap in mango orchard

Collection of male fruit fly in trap



Methodology for technology dissemination/popularization

KVK has initiated the participatory programme through large-scale demonstrations of the technology on farmers' fields in adopted villages. Different extension teaching methods such as Field demonstration, Training, Farmers Scientist interface, Group discussion, Diagnostic service etc. are used to transfer and promote the technology. Kendra has published pamphlet describing technology with illustration and provided to farmers. KVK has also encouraged and trained the farmers to prepare the traps from locally available resources like empty plastic

water bottle (1 lit), cotton plug etc.

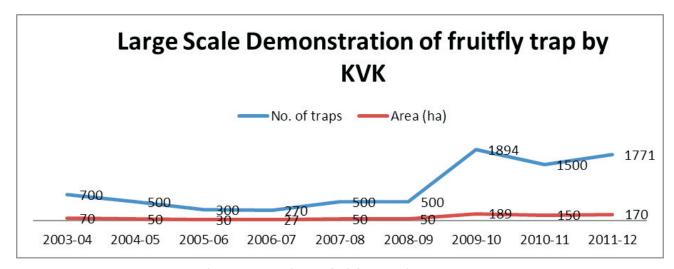
In order to provide wide publicity to the technology, selected resource persons and village extension workers (VEWs) and other district functionaries were also trained by KVK regarding preparation and use of trap in fruit crops. Selected farmers of the adopted villages were also trained during institutional as well as non institutional training and laying out demonstrations on their field through KVK and also in collaboration with state dept. of Horticulture and Navsari Agricultural University.







Mass Awareness Programmes for spread of fruitfly trap technology



Yearwise demonstration on fruitfly traps in mango by KVK

Output

Year wise demonstration on Fruit fly (Methyl Euginol) Traps in Mango by KVK

| Year | No. of traps | Area (ha) | No. of farmers |
|---------|--------------|-----------|----------------|
| 2003-04 | 700 | 70 | 62 |
| 2004-05 | 500 | 50 | 50 |
| 2005-06 | 300 | 30 | 61 |
| 2006-07 | 270 | 27 | 51 |
| 2007-08 | 500 | 50 | 39 |
| 2008-09 | 500 | 50 | 61 |
| 2009-10 | 7894 | 789 | 397 |
| 2010-11 | 1500 | 150 | 168 |
| 2011-12 | 1771 | 170 | 197 |

Result of demonstration (Average)

| Result | Fruitfly Damage (%) | Yield (Kg/ha) | Increase in yield (%) | Gross Income (Rs/ha) | Cost (Rs/ha) | Net Return (Rs/ha) | B:C Ratio |
|---------------|---------------------|------------------|-----------------------|----------------------------|-----------------|--------------------------|--------------|
| Demonstration | 11 | 10120 | | 202400 | 53130 | 149270 | 3.81 |
| Local Check | 32 | 7950 | 27.30 | 159000 | 59225 | 99795 | 2.68 |

The tribal mango growers were not aware of attack of fruit fly, its nature of damage and management. They were applying pesticides which are costly and not eco-friendly. Spray of pesticides on the big canopy of mango tree is very drudgeries task. Even use of the foot sprayer pump does not work efficiently to reach the height of old trees. There was high consumption of pesticides which increase the cost of cultivation. Inspite of all this efforts, farmers could not get satisfactory management over the fruit fly. Higher dose of pesticides causes residual effect on mango fruits. Thus majority of the tribal mango growers do nothing to solve the problem resulting in to poor

production in terms of both quantity and quality.

It is estimated that fruit fly in this area causes about 30 to 35 % loss in mango. The adoption of fruit fly trap technology has resulted in good control over the fruit fly. This technology saves the loss caused due to falling of premature fruits, leads to increase about 20-25% marketable yield and thereby increase in net income. It also ensures quality production of fruits without any residual effect.

By adopting this technology, farmers need not to spray whole orchard for the management of fruit fly. It reduces cost of pesticides application to the tune of about Rs. 5500/-per ha.



Earlier, sponge containing Methyl Euginol and dichlorvos was used in plastic bottle as a device of fruit fly trap. But, the sponge need to be recharged at 12 to 15 days interval to maintain its efficacy. So, it was not properly implemented by the farmers. Latter plywood block is used instead of sponge which needs not to recharge throughout season and it gave good result. Some farmers' use only plywood block hanged on trunk with neil on mango tree without trap box and it also fulfill the purpose.

Outcome

Because of large scale demonstration and trainings, farmers could realize the importance of cheaper, low cost, eco friendly technology and adopted it. Owing to the growing demand of fruit fly traps by the mango growers, pesticides dealers have started selling of the same and thus it is now became easily available in the local market (on the doorstep of the farmers).

Looking success of the technology in the field condition, State Department has allocated special scheme for the popularization of this technology through KVK in the district. SAU has also supplied about 8000 such traps for wider adoption amongst the tribal mango growers of the district.

In order to fulfill the increasing demand of farmers, KVK has started the production of fruit fly traps and supplying to the mango growers at reasonable price.

Impact

Fruit fly trap is an important technology in the recent trend of organic farming. Looking to the benefits of this easy, eco friendly and cheaper technology, many farmers of Valsad district have adopted this technology. The survey conducted by the Kendra shows that 32 % farmers of the selected villages of the district have fully adopted this technology in their orchards. It is also estimated that 12 % of the total area in the district under mango cultivation has been brought under this technology. The technology is easy to use, low cost, hence having great potential to popularize in mango growing areas of Gujarat as well as other states to make "Fruit fly free zone".

Year wise production and supply of Fruit fly (Methyl Euginol) Traps in Mango by KVK:

| Year | No. of traps | Area (ha) | No. of farmers | Amount (Rs.) |
|---------|--------------|-----------|----------------|--------------|
| 2012-13 | 1439 | 144 | 86 | 39430/- |
| 2013-14 | 1973 | 197 | 146 | 53050/- |
| 2014-15 | 1824 | 182 | 123 | 52940/- |
| 2015-16 | 1973 | 197 | 135 | 58550/- |
| 2016-17 | 1810 | 181 | 124 | 63070/- |

Backyard poultry and Goatry Farming enhanced livelihood of tribal farmer

KVK-Vadodara, Gujarat

Name of farmer : Rathva Jaysukhbhai Revlabhai

Address : Village:Piplada, Taluka: Kawant

District: Chhotaudepur, Gujarat

Mobile Number : 09978951329



Situation analysis/ Problem statement

The population of Kawant, Chhotaudepur district is predominantly tribal community. Majority of farmers were migrating to Saurashtra, Gujarat for work due to less availability of water and low productivity of crops as well as livestock in this region. In this region, majority of people are non-vegetarian and due to their non-vegetarian dietary pattern there is a good demand for meat and egg in this area. Every Monday Hatt market is organized in Kawant taluka and gathering the people is observed in hatt market surrounding the taluka. Madhya Pradesh border and meat merchants come from Maharashtra for purchasing so that a very good demand of Indigenous poultry, eggs and goat is prevailing. But the production in the region is poor due to traditional method of rearing livestock. Based on need of the region, high production potential poultry bird (Pratapdhan and Three ways cross colour breed) have been introduced in the year 2014 by Krishi Vigyan Kendra, Mangal Bharti, Vadodara through under the FLD and popularized as a source of sustainable livelihood for rural resource poor farmer. After successful

completion of FLD village farmer Shri Jaysukh Revlabhai Rathva inspired and became ready to adopt as a commercial venture and developed the market in hatt Bazar, Kawant.

Plan, Implement and Support

Shri Jaysukh Revlabhai, Rathva has a total 3 acres of land out of which 2 acres are nonirrigated. He developed interest in Integrated Farming System mainly by including poultry and goatry along with farming. For acquiring information on poultry and goatary he approached Krishi Vigyan Kendra, Vadodara. He participated in various training programmes like Integrated farming system, backyard poultry, goat farming and visited various poultry farms those are partially successful in the locality and searched the demand of which breed is high in Hatt Bazar so as to get the maximum price in minimum investment. After completion of survey, he meet again to KVK Scientist and finalized the project and purchased 1000 chiks of three way cross colour just like a Deshi type from AAU, Anand, Gujarat those birds are under observation and in testing process not finalize the breed name and 30 goat from the locally available neighboring farmers.



Output

He started small Backyard poultry and Goatry farming in one sheds and size of shed is 150 sq ft each. He has interest in backyard poultry and Goatry and his interest was ignited when he visited Poultry unit of Anand Agricultural University, Anand, Gujarat. He started Pratapdhan, 100 birds in early 2014 (Poularized under the scheme FLD by KVK and ATMA FSS). Proper housing, feeding and disease management of birds led to early maturity (2.0 kg body weight gain in 4 months) in birds, first egg lay (at 22 weeks of age). He could sell 25 cocks in Hatt bazar, Kawant @ 400/ bird after 4 months of age. He managed to get about 1000 eggs from remaining 50 hens and sold each egg at the rate of Rs 9 per egg. Keeping Pratapdhan helped him in generating cost of daily expenses of his farm. In March, 2015 he replaced the birds stock by selling each bird for Rs 500. Gross income from first batch of 100 birds fetched by him was Rs 44,500. After this successful project and interest created in poultry, he visited again the AAU, Anand and purchased the 1000 one day old chicks three way cross colour (seen just like a Deshi type) and high market value and more egg laying capacity) from AAU, Anand poultry farm. Shri Jaisukhbhai Revlabhai Rathva supplies the egg, bird and buckling regularly in Hatt market of Kawant and get good earning.

Shri Jaysukh Revlabhai Rathva has maintained birds on kitchen and farm waste feeding and under timely vaccination and goats are grazing in waste land in a day and not any extra feeding for goats. At present have a total 1000 birds and 40 goats have been kept by him.

He has set many examples for the farming community for feasible, economically viable and sustainable enterprise.

Outcome

Due to easy accessibility of market, other farmers can also start the enterprise conveniently. It has generated employment opportunities for rural youth and farmers were enriched with sound knowledge on commercial farming of breed. The venture has successfully generated average income of Rs. 20,000 from eggs and Rs. 50,000 from meat. Local non-descript birds were upgraded due to crossbreeding of improved breed. Feed back of farmers includes faster growth of birds more number of bigger sized eggs thrives well under low input system, resistance to most of the diseases, and requires small space, minimum labour force and investment.

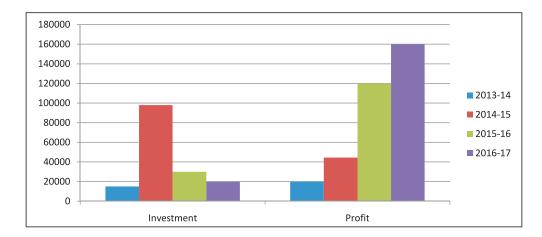
Impact:

Nowadays, farmers from many places in Kawant get inspired and developed confidence after meeting with Shri Jaysukhbhai Revlabhai Rathva and seeing his farm. For holistic livelihood development, Shri Rathva has proven that a farmer with dedication, hard work and keen interest can thrive well with Integrated farming in their small land holdings. He inspired and facilitated 10 farmers to start backyard poultry farming.

He has been honored with the Best Farmer Award (2016-17) by the ICAR-Central Soil and Water Conservation Research and Training Institute (ICAR-CSWCRTI), Vasad ,District-Anand, Gujarat.

Table: Economics (Investment & Profit) of both units

| Year S.No | 2013-14 | 2014-15 | 2015-16 | 2016-17 |
|------------------|---------|--|----------|----------|
| Total Investment | 15,000 | 98,000(1000 @8 rs/chick 30 @3000 rs/goat) | 30,000 | 20,000 |
| Total Profit | 20,000 | 44,500 | 1,20,000 | 1,60,000 |











Protected cultivation of vegetable has proved as alternate source of livelihood

KVK- Rajkot-II, Gujarat

Situation analysis/Problem statement

Shri Hareshbhai Viradiya is an innovative farmer of Motamahika village, taluka-Gondal district Rajkot of Gujarat and is having cultivated 1.3 ha of land. He has education upto 11 standard, during his study, due to some reason he left his study and started a small business of repairing farming tools and machinery at his own village. At that time, his father was looking after his farming and earned only1.5 to 2 lack from his land annually by cultivating regular crop (Groundnut, cotton, cumin) without any improved technological knowhow. Once Mr. Haresh visited one protected cultivation at Junagadh Agricultural University, Junagadh, being a mechanical behavior, he thought to grow crops or vegetables in protected cultivation. He starts to collect information about green house and finally in 2013 set up well-structured green house of 1 acre on his own land in first 2 years he failed to produce quality vegetables from green house and suffered economical loses because of heavy pest and disease infestation. Now he decided to produce quality food from green house, at that time he contacted to scientists of Krishi Vigyan Kendra. Because of KVK scientists' efforts and his hardworking nature, his yield and went to extremely high which was never expected by hi,

Plan implement/Support

Mr. Hareshbhai is a young educated farmer of motamahika village. Earlier Hareshbhai was doing another business of repairing of farming tools. He prepared farm tools of his own. By knowing the greenhouse farming after participating in KVK Pipalia training and frequent visit to KVK, he decided to prepare a greenhouse and start vegetable farming in greenhouse.

Shri Hareshbhai made greenhouse of 1acre area in the year 2013-14 and initially he cultivated off season ridge gourd and cucumber and got maximum prices from the market. Initially he faced some problems like heavy pest and disease occurrence, improper pollination. He was new to this type of farming and never knows to mitigate with this type of situations. Due to improper pollination in vegetable, he also ready to adopt bee keeping in green house but not get guidance however after getting proper guidance from scientists of KVK his problems was resolved. He adopted hand pollination at flower opening time by identifying male and female flowers, whole family was doing this operation until mid-night, and by proper pollination they have got not only maximum production but also ways to do proper use of IPM practices to protect their crops from heavy attack and occurrence of pest and diseases.



Output

Shri Hareshbhai mentioned that by adopting this technology after two year of extreme effort, he got more output from 1-acre area as he never got it from open field. As compare to earlier situation, in the 3rdyear he produced 15,000 kg of ridge gourd and earned

Rs7, 20,000 /-from 1-acre area in Rabi season. Whereas in 2015-16 year he produced 15,000 kg of cucumber and earned Rs2, 70,000/- income from kharif season. Total16,000 kg of ridge gourd production and Rs8, 00,000/- annual income from this 1-acre area, finally he earned Rs. 10,70,000/- during year 2015-16 from 1 acre green house.

| Year | Season | Crop | Production (kg/acre) | Gross Return (Rs./acre) | Expenditure (Rs./acre) | Net Profit (Rs./acre) |
|-------------------|-----------------------|-------------|----------------------|----------------------------|------------------------|-----------------------|
| 2013-14 | Kharif | - | - | - | - | - |
| | Rabi | Ridge Gourd | 15,000 | 7,20,000/- | 1,30,000/- | 5,90,000/- |
| Total (201 | Total (2013-14) | | | 7,20,000/- | 1,30,000/- | 5,90,000/- |
| 2014-15 | Kharif | Cucumber | 12,000 | 2,50,000/- | 1,10,000/- | 1,40,000/- |
| | Rabi | Ridge Gourd | 8,500 | 4,50,000/- | 1,20,000/- | 3,30,000/- |
| Total (201 | 4-15) | | 20,500 | 7,00,000/- | 2,30,000/- | 4,70,000/- |
| 2015-16 | Kharif | Cucumber | 15,000 | 2,70,000/- | 1,15,000/- | 1,55,000/- |
| | Rabi | Ridge Gourd | 16,000 | 8,00,000/- | 1,30,000/- | 6,70,000/- |
| Total (201 | Total (2015-16) | | | 10,70,000/- | 2,45,000/- | 8,25,000/- |
| Grand To | Grand Total (3 years) | | | 24,90,000/- | 6,05,000/- | 18,85,000/- |

Impact

With adoption of improved technology, Shri Hareshbhai able to stand his life economically at upper stage and become a respected person in community. He proved that



when improved knowledge and hard working works together then we can achieve our desired goal. Shri Hareshbhai set an example of doing farming as a business point of view instead of regular farming that we are doing since our





ancestors. He likes to encourage and trained nearby rural youth about vegetable production in protected cultivation. His adventurous efforts encourage other 10 to 15 farmers to develop this

type of protected cultivation structure and whenever they have any troubles regarding they contact KrishiVigyan Kendra scientists and Haresh bhai also.









Economic Empowerment of Farmwomen Self Help Group through profitable dairy enterprise

KVK-Jaipur-I, Rajasthan

Situation analysis/Problem statement

Empowerment strategy is emerging as a unique Indian response to the challenge of quality and development for women to be empowered, it is essential to provide them access to information, knowledge, resources and power to make decisions. Women have suggested with neglect and deprivation over centuries. For long they have not been regarded as equal partners in the development process. Even though no deliberate effort had been made to keep women out, yet though the process of evolution of societies women got confined to the four walls of their domesticity and in the process were cut off from the main stream of development activities. The continuous neglect has led to this becoming poorest among poor. Constant discouragement from their own family members as well as outside world incapacitated women and made them feel small and incapable for the world at large. Since inter-cultural dialogue is a precondition for progress towards empowerment and sustainable livelihood.

Rural farm women are the most deprived in today's world. Even though they work the longest hours on farm and have achieved more with lesser resources, they are not recognized and appreciated for their contribution. They remain at the end of the distribution chain for productive resources and some sources despite being at the beginning of the food production chain. In the developing countries women are responsible for more than 55 per cent of the food grown and comprise 67 per cent of the agricultural labor forces. In India, 78 per cent of

all economically active women are engaged in agricultural. Almost 50 per cent of rural female workers are agricultural labours and 37 per cent are cultivators.

Dairy Cooperatives have emerged as a boon for resource poor with producers and played a vital role in the success story of our dairy development. In Rajasthan, dairy cooperative development programme has been a remarkable success. Villagers who live in a distance of two km can conveniently pool up their milk in the connecting centre. Dairy Cooperatives at village level have been organized with the idea of imaging millions of milch producers under the umbrella of cooperatives. Milk producers with small scale production constitute an important component of dairy.

It is said that India lives in villages since a large majority (58 per cent) of the families are dependent on agriculture with livestock constituting an integral role. Dairying is a very patent and easily operational source of increasing income of marginal farmers with their existing resource base. Dairying, being a self income generating enterprise, can meet the short-term requirements of the farmers for agricultural by providing regular income. The women's share of the work force and their contribution to total family income are substantial in households of lower economic strata.

Thus the economy of poor families depends greatly upon women's income productivity. If women are made economically



more productive it will reduce their dependency, enhance their status in the family and also contributes towards increasing aggregate labour productivity. Among the enterprises that have women's involvement dairying and animal husbandry activities have their intense participants.

Jaipur District in Rajasthan has a total population of 38,87,900. The rural population accounts for 241945. The agricultural labourers and cultivators are 54306 and 40%, respectively. Women constitute 43.9% of agricultural labourers. Though agriculture is main occupation for majority of people in the district, because of rainfed farming and limited irrigation facilities, agriculture alone could not meet their requirements, which forced them to go in for a subsidiary occupation like milk production.

The Self Employment avenue that can provide employment opportunities in Jaipur District of Rajasthan is dairying with the spread of milk chilling and storing technology all over the district, the demand for milk had increased. Krishi Vigyan Kendra-Jaipur had launched a programme to promote the level of awareness, skill and managerial ability required for the women to employ themselves gainfully in various fields since, household dairying is the single largest activity in the rural women can be gainfully employed. KVK-Chomu had launched a massive training and employment proramme for women dairy farmers in Sandersar-Chomu Mahila Mandal of Jaipur District with a base of 100 women dairy farmers.

During the survey of villages to analyze need and problems, to help in relieving their financial problems, it was felt that group activities, group saving an income generating activities like dairying will be highly useful and viable propositions.

Plan, Implemented support

- 1. By encouraging women in SHG's empowerment process would be set in motion.
- 2. Building of communities with basic infrastructure for ensuing continuity of the dairy activity.

For various points identified, plant of action was also prepared for example to facilitate better marketing. Steps were taken for establishment of Women Development Cooperatives, identification of Vendors, establishment of Milk Collection Centre etc.

Problem Identification Matrix

1. Lack of knowledge about the

| | correct-time of insemination | - 82 |
|----|--|------|
| 2. | Lack of credit facilities | - 83 |
| 3. | High cost of Veterinary Medicines | - 80 |
| 4. | Lack of training facilities on the livestock management and health | - 60 |
| 5. | Low rate of literacy among the farm women | - 62 |

(Scale: Very High 80-100, High 60-80, Low 0-60)

Various steps followed to make dairying in women groups a successful enterprise are detailed in table given above i.e.2. Initially two mandals i.e. Sandersar & Ginoi were identified for the implementation of this programme. Total number of villages covered in these two mandals was 120. In these villages, group discussions were held to acquaint the beneficiaries with the details of the plan of programme implementation.



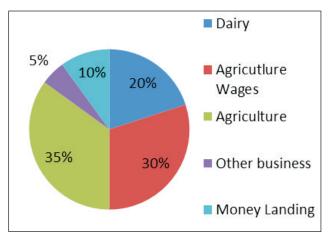
| S.No. | Intervention | Plant of action |
|-------|--|---|
| 1 | Inadequate market linkage | (i) Linkage with private dairies (ii) Establishment of Milk Collection Center (iii) Formation of SHGs |
| 2 | Low level of skills on household dairying | (i) Training to Partners (ii) Management techniques for handling of cross bred animals (iii) Awareness and motivation on Cross Bred Animals (iv) Group Discussions |
| 3 | Lack of Proper training facilities | Training of SHG members |
| 4 | Lack of credit facilities | Providing loans from different sources like near-by Bank |
| 5 | Irregular Payment from milk Procuring Agencies | (i) Linkages with private dairy in addition to Govt. Dairy (ii) Linkages with Local Vendors for timely collection of money |

KVK trained to women in preparing feed concentrate at home using locally available ingredients like wheat iron, oilseed cakes etc. in proper proportion depending on the requirement of animals.

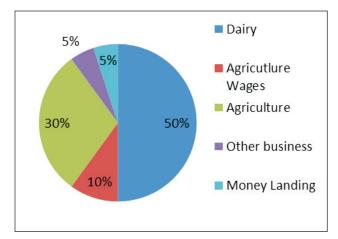
Out Come

Before intervention of the Dairy Programmes, women were spending 30% of

their activity towards agriculture labour. A very little attention towards diary activities was paid because of low capital base. After the implementation of the programme, 50% of their activities were towards dairying. The income raised through dairy was higher as compared to agriculture based activities. The details of income & expenditure are shown in figures below:-



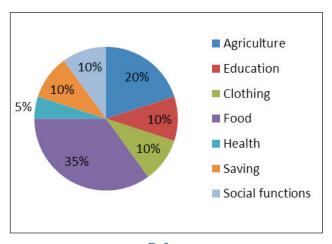




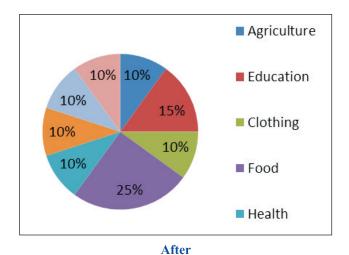


Before the implementation of the dairy programmes, the annual income of the partner women was low (Rs. 10,000 – 12,000/- per year). Consequently, utilization of the amount towards different activities like food, social functions, clothing, health and education was also low (10-15%) after the implementation of

the project the annual income level has raised (Rs. 4,000 – 5,000/-). Hence, utilization of money towards different activities like Food, Health, Education, Creation of Asset, Saving etc. also improved considerably (15-25%). The details of livelihood analysis are given below:-



Before



Vaccination Camps

Every year KVK, with support of the other organization, arranged Vaccination Camps where chemical diagnosis of repeat breeding case and treatment of various ailments were taken up.

New Innovations adopted by the women in dairy:

- 1. To prevent souring of milk during summer season, women keep milk in steel buckets hanging on wooden pole at 5-7 feet height from ground level.
- 2. To avoid coaleases in milk during summer days women use sodium-bi-carbonate before boilin.

Before the intervention of the dairy activity, the partner women utilized most of the money for the agriculture and household activities. After the intervention of the programme merely 35% of the money is spent on dairy activities. 15% on agriculture activities and 10% for labour activities. The remaining money is spent for household activities.

Women as Master Trainer in Dairy

KVK trained the women at village level to manage the day-to-day problems in dairy like clean milk production, feed and fodder management of cattle etc.



Impact

The economic empowerment of rural women through dairy sector based on group approach has increased The major impact of these activities increase of average milk yield (one liter/animal/day) decrease in dry period and



inter-calving period with concerted efforts of KVK Jaipur-I and active involvement of farm women. Increase in average income, gross income/ family by 38000/year and desirable changes in other social and economic parameters has been noticed.





IFS- Boon for sustainable income generation

KVK-Dungarpur, Rajasthan

Name of Farmer : Mr. Jivan Lal Patel

Address : Village: Bhujara, Panchayat: Karouli

Tehsil: Bichiwara, District: Dungarpur

Contact No.: 7023070877

Age: 38 yearsEducation: 2th passLand Holding: 3.25ha

Crops grown: Maize, rice, wheat, black gram, green gram, gram, soybean,

tomato, brinjal, coriander, chilli and okra

Live stock : Cows: 7 (HF cross breed), Buffaloes: 3 (Murrah)

Poultry unit: one commercial unit (Pratap dhan)

Farming: Vermi compost unit, Azolla unit, Milk collection centre

supplementary interventions

Situation analysis/ Problem statement

Sh. Jivan Patel is a medium large farmer of village Bujara (Karouli), tehsil Bichiwara, District Dungarpur in Rajasthan. His education is up to 12th standard and having 4 ha. land. Due to poor family background, Sh. Jivan Patel left his study and migrated to Kuwait to fulfil his family needs. But he did not succeed, so came back and joined farming with his father. However, he had sufficient agricultural land with good water facilities, but due to lack of knowledge awareness, skills about good agricultural practices he was unable to meet felt needs of family. His whole family was involved in traditional farming. The local and old varieties of crops mainly of maize, rice, wheat, green gram, black gram, chickpea and sugarcane were

cultivated. He also had two buffalos of local origin with very low milk production. Five year back he purchased 7 HF Cross bred cows and 3 Murrah buffalos worth of Rs 5 lacs by receiving loan from Bank of Baroda, Bichiwara, District Dungarpur with the help NABARD with 25% subsidy and started Dairy farming but due to lack of improved rearing knowledge and poor maintenance, he was not getting profit. In this situation he was in search of proper training and expertise for enhancing income.

Plan/Implement & Support

Four years back (2013) Sh. Jivan Patel came in the contact with Krishi Vigyan Kendra, Dungarpur through participation in on campus training organized by KVK. He participated in





Hon'ble VC Visited Vermicompost Unit at farmer's field

several on/off campus trainings on crops, vegetables, processing & value addition animal husbandry, integrated diseases management, poultry, kisan gosthi, field days, field visits, kisan melas and animal treatment camps organized by KVK scientists. With the guidance of KVK scientists, he started cultivation of improved varieties of crops and vegetables, established vermi-compost unit, Azolla unit and a commercial poultry unit of Pratap Dhan breed. He has also taken FLDs of maize, soybean, green gram, chilli, okra etc. He visits the KVK regularly and has become member of KVK Whatsapp group to get the technical know-how and update his knowledge for maintaining his integrated farming.



Hon'ble VC Visited Azolla Unit at farmer's field

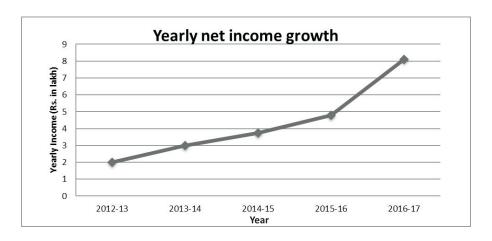
Output

Presently due to adoption of improved practices, his efforts, hard work and timely technical support from KVK and other line departments his net income is increasing day by day.

Now several other farmers of his village and nearby villages (Karouli, Gadmala, Hathod, Padradi Mada, and Bichiwara) have contacted to him and have to take advices from him about profitable agricultural practices and improved rearing of animals to increase milk production. Details of income are as under and yearly income growth is depicted in graph.

| S.No. | Particular/ Items | Average net earnings/year |
|-------|---|----------------------------------|
| 1 | Crop production | Rs. 2.00 lacs |
| 2. | Vegetable production | Rs. 60 thousands |
| 3. | Milk production | Rs. 3.00 lacs |
| 4. | Poultry production (Eggs and chicks) | Rs. 2.00 lacs |
| 5. | Vermicompost selling | 50 thousands |
| | Total income | 810000/- Eight lacs ten thousand |





Impact

Earlier his income was not sufficient for family expenses. Now he is not only fulfilling the needs of his families but he is giving better education to his children. The purchasing power has also improved, now he has modern assets in his house like Freeze, LCD TV, Smart Phone, motor cycle, chalf cutter machine etc. He is now being known as lead farmer in Bichiwara block of Dungarpur District in Rajasthan and several other farmers follow him.

















Salinity tolerant KRL-19 variety of wheat enhance productivity and stability

KVK-Bhavnagar, Gujarat

Situation analysis / Problem statement

Bhavnagar district of Gujarat state is divided into three different agroclimatic zones. The costal belt of the district, comprising Mahuvataluka, falls under South Saurashtra Agroclimatic Zone. The zone as characterized asmedium rainfall area (625 -800 mm) with different types of soils viz., medium black soil, costal alluvial soil and shallow black soil. The major crops of the zone are cotton, groundnut, maize, sorghum, pearl millet, wheat, onion. Being a coastal area, salinity ingress in undergroundwater and increase in soil salinity are the major constraints faced by the farmers of this region. Poor yield of major crops had restricted cultivation of wheat crop in the surrounding area of Kalsar village (taluka: Mahuva). Being a staple food grain crop, poor yield of wheat was a major constraint for the farmers, especially for small farmers.

Plan, Implementation and Support

- After establishment of KVK-Bhavnagar, in the year 2011, KVK developed linkages with local farmers through an NGO (Triveni Kalyan Foundation) based at Kalsar village.
- After conducting Agro-Eco System Analysis by applying PRA tools, KVK came to know about the problems and needs of the farmers' group of this locality.
- KVK scientists collected soil samples from farmers' fields and analysed for soil salinity. Soil salinity was found to be very high (> 5.0 dS m-1).

- KVK scientists searched / inquired for a salinity tolerant variety of wheat at CSSRI, Karnal. After a discussion with scientist of CSSRI, Karnal, salinity tolerant variety KRL 19 was found suitable for the region.
- KVK planned to organize front line demonstrations of the variety in surrounding area of Kalsar village. Seed was procured from CSSRI, Karnal. Front line demonstrations of wheat variety KRL 19 on farmers' field were laid out in Rabi, 2013-14 in 5 ha area.
- All the package of practices including time of sowing, method of sowing, nutrient management, and crop protection for wheat cultivation was extended to farmers through printed literature and regular visit to demonstration plots. A healthy crop emergence and plant stand obtained. At full growth stage, field day was organized and farmers' feedback collected.

Output

- The farmers adopted the recommendations and line sowing, which ensure optimum seed rate in comparison to broadcasting as well as a uniform sowing and germination of crop was achieved.
- Similarly, following the recommendations for nutrient management reduced fertilizer application cost and 10 per cent cost of fertilizers was saved.



- The variety performed well and exhibited grain yield ranging from 2700 kg/ha to 3500 kg / ha in different fields. Farmers received 15 per cent higher yield than the locally cultivated variety.
- As a result, farmers earned average Rs. 37718.00 net profit per hactor(Cost Benefit Ratio 2.13) in the demonstration plots as compare to Rs. 27690.00 net profit per hactor(CBR 1.83) in the local check plots.
- Looking to the yield received, farmers were very happy and revealed that they would like to store some portion of the harvest as seed for next year.

Outcome

- The farmers under front line demonstration kept seed for next season and Farmers to Farmer seed exchange surplus to the other farmers for cultivation in Rabi, 2014-15.
- On demand of farmers KVK also produced truthful seed of KRL 19 at KVK demonstration farm and distributed to farmers in 2015-16.
- Within two years (seasons) of the demonstration, the variety has been spread over 7-8 villages covering more than 80 ha area.

area.

Impact

- Earlier the farmers around the Kalsar village of Mahuvataluka were forced to leave wheat cultivation due to poor yield because of soil salinity and unavailability of salinity tolerant variety.
- Due to the introduction of KRL 19 variety through front line demonstration, farmers are cultivating the variety and also sell seed to other farmers. Farmers of the region are now capable of producing sufficient wheat grains for domestic consumption also.
- Introduction of the variety with other recommended cultivation practices has increased productivity of wheat up to 15 per cent and net profit up to Rs. 10000 /ha with better cost benefit ratio.
- Farmers of the region who have adopted the variety along with the other recommended practices of wheat, are now able to earn additional Rs. 10000 to Rs. 12000/ha.
- Horizontal spreads of the variety still continues and follow up by KVK-Bhavnagar for technical backstopping for the same also continues.



A visit to KVK Motivated Kalyan Singh to become an A.I. Worker

KVK Udaipur, Rajasthan

Name : Kalyan Singh Rao

Father's Name : Sh. Kesar Singh Rao

Village : Kodav

Panchayat Samiti : Kurabad

Tehsil : Girwa

District : Udaipur

State : Rajasthan

Mobile No. : 09001306521

Introduction

Sh. Kalyan Singh Rao a resident of village Kodav which is 60 kms away from district headquarter Udaipur was earning his bread and butter through traditional agriculture and animal husbandry. He own .2ha of irrigated land, .3ha unirrigated and 1ha of pastureland. He has seven animals including 2 buffaloes, 1 cow and 4 off springs. He took education upto ninth standard in a local government school.

Total breedable brovine population of Udiapur district is approximately 6,46,061. Whereas the total number of working A.I. workers in the district is 3,133 these working LSA's cover hardly 15-20% of total breedable population of the district. So there is a strong need to train unemployed youth/school dropouts to fulfill the gap in this area.

Intervention/Technology details

In the month of Sept 2015, Sh. Kalyan Singh visited KVK Udaipur and saw ongoing training programmes on primary health care, animal first aid and artificial insemination. After the visit, he maintained regular linkage with SMS (AH) and expressed his desire to attend the same training programme. After few days, we received a proposal from RCDF Pali to organize a training programme veterinary on first aid and artificial insemination. So keeping in mind keen interest, we included him in training programme. Since, this was a short duration training programme of 10 days. KVK associated Sh. Kalvan Singh later with Sh. Chandra Shekhar – a trained Live Stock Assistant to practice in KVK Udaipur dairy unit where he intensively practiced AI & PD work.



After the successful practice, KVK Udaipur introduced sh. Kalyan Singh to Tirupati Balaji Foundation – a A.I. service provider, who provided him a LN2Jar, AI Gun, regular supply of LN2 and semen straws. The foundation has good quality Semen of Exotic and Indigenous breeds and Sh.Kalyan Singh has started AI work in his field. He is also getting help of Veterinary Doctor & LSA of Kurabad centre for first aid practice.

Significant Output

Initially, Sh. Kalyan Singh used to perform on a average 15 AIs per month but now due to his technical efficiency and scientific approaches he is performing on an average 120 to 150 AIs per month. In near future Sh. Kalyan Singh is expecting 250-300 A.I. per month by covering nearby villages.

Economic Feasibility

Due to his sincere efforts, his average monthly income which earlier was Rs. 15000/per month, has now reached to Rs. 30,000/- to Rs. 32,200/-. In the coming months, he is optimistic to receive more income by spreading his work area.



Impact/Horizontal and vertical spread

Nowadays, Sh. Kalyan Singh is not leaving any stone unturned to make his different identity in the LSA fraternity. On the one hand where government officials are ignoring the very basic principles of AI and running behind the targets, Sh. Kalyan Singh is strictly following the principles of AI which he has learnt during his training in VBKVK, to ensure proper temperature of water for straw thowing, knowing the farmers' choice of semen breed etc. More than this, Sh. Kalyan Singh cuts his fees upto half in case animal is repeated after 12 hours and in case of repeat breeding. Due to all these qualities, new animal keepers are adding to his clientele day by day and are motivating for artificial insemination.

In the future, Sh. Kalyan Singh wishes to learn more about balanced ration of animals so that he can transfer the technique to his clientele which will ultimately increase the conception rate of his working area.







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Participation in workshop/ seminar/ meetings

- Dr. R. B. Kale participated in a roundtable brainstorming meeting on "Developing Transparent Performance Indicators on Functioning of KVKs" on 5th August, 2016 at NASC Complex, New Delhi organized by IFPRI.
- Dr. R. B. Kale participated in National Workshop on Skill Development in Agriculture at NASC Complex, Pusa, New Delhi on 5th January 2017 organized by Department of Agriculture, Cooperation and Farmers' Welfare.
- Dr. R. B. Kale participated in Training Programme on "Competency Enhancement Programme for Effective Implementation of Training Functions by HRD Nodal Officers of ICAR" organised by NAARM, Hyderabad in collaboration with Centre for Good Governance (CGG), Hyderabad during 13-15th Feb 2017.
- Dr. R. B. Kale participated in Workshop on Good Practices in Extension Research and



Evaluation during 29 Nov-2 Dec 2016 at NAARM, Hyderabad.

Kale, R.B., Ponnusamy K., Sendhil, R., Meena, M.S. and Singh, S. K. (2017). Forecasting dairy scenario on Dairy developing states of India: A Delphi survey approach. Abstract accepted for oral presentation in 37th International Symposium on Forecasting, Cairns Convention Centre, Cairns, Australia 25-28 June 2017.

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Meena, M. S., Kale, R. B., Singh, S. K., & Gupta, S. (2016). Farmer-to-Farmer Extension Model: Issues of Sustainability& Scalability in Indian Perspective. Lead paper published in ISEE National Seminar on Information and Communication Management concerning Climate Smart Agriculture for Sustainable Development and Poverty Alleviation held at R.V.S.K.V.V. Gwalior, November 28-30, 2016.

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Participated in All India RAPs meeting at Jaypee Siddhartha Hotel, New Delhi from 23-27th May 2016 under ICAR-AgMIP-ICRISAT collaborative project.

Singh, Harbir, Subash, N., Paudel, G., Singh, B., Meena, M. S., Singh, S., Valdivia, R. and Baigorria, G. (2016). Developing Representative Agricultural Pathways: Experiences and Learning across Four Sites in India, paper presented during 6th AgMIP global workshop on Seeking Sustainable Agricultural Solutions, Session 2.1: Scenarios and RAPs, June 28-30, 2016 at Montpellier, France.

Singh, S. K., Kale, R. B., & Meena, M. S. (2017). Approaches of transfer of agricultural technologies in India: an evolutionary perspective. Lead paper in National Seminar on "Seed Spices for Enhancing Farmers Prosperity and Livelihood Security" during January 21-22, 2017 at ICAR-National Research Centre on Seed Spices, Ajmer, Rajasthan.



Subash, N, Singh, H., Panwar, A.S., Meena, M. S., (2016). Assessment of Climate sensitivity to present production system and evaluation of use of adaptation strategies to improve the livelihood security of small and marginal farmers of Indo-Gangetic Plains of India — A multi-crop-climate-economic modeling approach. Paper presented during 6th AgMIP global workshop on Seeking Sustainable Agricultural Solutions, Session 2.7: Regional Integrated Assessments June 28-30, 2016 at Montpellier, France.

Subhash,N; Singh,H; Panwar,A.S; Singh,S.V,Meena,M.S. et al (2016). Developing National Representative Agricultural Pathways (RAPs)—Reflections, lessons and outcomes from high level stakeholder consultations in India. Paper presented during 6th AgMIP global workshop on Seeking Sustainable Agricultural Solutions, Session 2.1: Scenarios and RAPs June 28-30, 2016 at Montpellier, France.

Presentations in Conferences/Symposia/ seminars/ other fora:

R. B. Kale, K. Ponnusamy, R. Sendhil, M.S. Meena and S K Singh 2017 Forecasting dairy scenario on Dairy developing states of India: A Delphi survey approach Abstract accepted for oral presentation in 37th International Symposium on Forecasting, Cairns Convention Centre, Cairns, Australia 25-28 June 2017.

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Model: Issues of Sustainability& Scalability in Indian Perspective. Lead paper published in ISEE National Seminar on Information and Communication Management concerning Climate Smart Agriculture for Sustainable Development and Poverty Alleviation held at R.V.S.K.V.V. Gwalior, November 28-30, 2016.

R. B. Kale and K. Ponnusamy (2017). Temporal Analysis and Forecasting of Dairy Scenarios in India. Presentation in Best Thesis Award Competition for PhD (Management Group), National Dairy Research Institute, Karnal on 1st March 2017.

Paper presented in XIII Agriculture Science Congress on, "Climate Smart Agriculture" jointly organized by UAS Bengaluru and NASC New Delhi w.e.f 21 to 24 February, 2017.

Rohilla PP, SK Singh and Shyopal Ram Jat. 2016. Promising crop varieties adaptive to climate resilience in arid region. Pp: 124.

Srinivasrao Ch, Veni VG, Prasad JVNS, Sharma KL, Chandrasekha C.H, Rohilla PP and Singh YV 2016. Carbon balance scenario with the adoption of climate resilient management practices (camps) in tropical agro-eco-systems of Western India. Pp: 445.

Foreign Deputation

Dr. M.S. Meena, Principal Scientist (Agril. Ext.) participated in AgMIP Phase 2 Winner Circle Workshop held at Nairobi, Kenya from 30 January to 3 February 2017.

Annexure-I

Summary of technologies assessed under various crops by KVKs

| Thematic Area | Crop | Name of the technology | No. of trials |
|----------------------------------|--------------|---|---------------|
| Rajasthan | | | |
| Farm machinery | Field crops | Assesment of improved sickle from PAU Ludhiyana, CIAE, Bhopal | 3 |
| | Field crops | Assessment of different types of sickles for drudgery reduction | 3 |
| Integrated Crop Management | Ashwagandha | Refinement of Plant Geometry in Ashwagandha | 5 |
| Integrated Crop Management | Barley | Assessment trial of barley crop in salt affected Som Kamla Amba Dam command areas | 9 |
| Integrated Crop Management | Cauliflower | Evaluate spacing for cauliflower planting | 5 |
| Integrated Crop Management | Citrus | Assessment of bahar in citrus orchards for taking off season fruiting | 4 |
| Integrated Crop Management | Cluster bean | Wider spacing and seed rate in Clusterbean. | 6 |
| Integrated Crop Management | Coriander | Assessment of date of sowing in coriander | 5 |
| Integrated Crop Management | Groundnut | Sowing time | 3 |
| Integrated Crop Management | Groundnut | optimum seed rate | 3 |
| Integrated Crop Management | Groundnut | Sowing Time of Groundnut | 3 |
| Integrated Crop Management | Isabgol | sowing method of isabgol | 5 |
| Integrated Crop Management | Mustard | Optimum plant population for mustard getting higher yield | 3 |
| Integrated Crop Management | Mustard | Assessment of Di-methyl sulfoxide in control of frost | 9 |
| Integrated Crop Management | Pomegranate | Bahar management in pomegranate | 4 |
| Integrated Crop Management | Rapeseed | Effect of drought management strategies on seed yield of rapeseed. | 4 |
| Integrated Crop Management | Round Gourd | Assessment of Crop geometry on growth and yield of Round gourd | 5 |
| Integrated Crop Management | Wheat | Temperature stress management in wheat crop | 10 |
| Integrated Disease Management | Castor | Management of Castor wilt | 7 |
| Integrated Disease Management | Chickpea | Management of wilt and root rot in chick pea | 12 |



| Thematic Area | Crop | Name of the technology | No. of trials |
|-----------------------------------|-------------|--|------------------|
| Integrated Disease Management | Chickpea | Low yield due to wilt | 3 |
| Integrated Disease Management | Chickpea | Dose of Trichoderma harzanium for soil treatment to control root rot in chickpea | 9 |
| Integrated Disease Management | Chilli | Leaf curl virus disease management in chillies at nursery stage | 10 |
| Integrated Disease Management | Colocasia | Management of leaf blight disease of colocasia | 7 |
| Integrated Disease Management | Cotton | Management of bacterial blight /angular leaf spot of cotton by use of Seed treatment with streptocycline @ 100 for 8-10 hours followed by foliar spray with streptocycline @ 100 ppm + Copper oxychloride @ 0.25 % at the time of 2nd, 3rd and 4th spray schedule for insects management. | 5 |
| Integrated Disease Management | Cumin | Reduction in cumin area in the district due to wilt | 3 |
| Integrated Disease Management | Cumin | Disease management in Cumin | 10 |
| Integrated Disease Management | Cumin | Management of Alternari Blight in Cumin | 5 |
| Integrated Disease Management | Garlic | Management of rootrot | 5 |
| Integrated Disease Management | Groundnut | Dose of Trichoderma harzanium for soil treatment to control root rot in Groundnut | 9 |
| Integrated Disease Management | Mandrin | Round the year schedule to management of Black Fly and Shooty Mould in Mandarin orheard | 5 |
| Integrated Disease Management | Mustard | White rust management in mustard | 3 |
| Integrated Disease Management | Yam | Management of Anthracnose disease of yam by using of Seed treatment by dipping in solution of Carbendazim 50 WP @ 0.1% for 30 minutes thereafter in solution of Trichoderma @ 2% for 30 minutes. Three foliar sprays of Carbendazim 12% + Mancozeb 63% (75 WP) @ 0.15% at 15 days interval | 5 |
| Integrated Nutrient Management | Aonla | Impact of N.A.A. and calcium and boron on Aonla fruit drop | 5 |
| Integrated Nutrient Management | Barley | Yield maximization through soluble NPK spray in Barley | 10 |
| Integrated Nutrient Management | Ber | Nutrient Management | 5 |
| Integrated Nutrient Management | Cauliflower | Effect of molybdenum on curd quality and yield of cauliflower | 6 |
| Integrated Nutrient Management | Chickpea | Effect of soil and foliar application of micronutrients on gram. | 4 |



| Thematic Area | Стор | Name of the technology | No. of trials |
|-----------------------------------|-------------|--|---------------|
| Integrated Nutrient Management | Chilli | RDF NPK @ 70:48:50+Use of Water soluble fertilizer(NPK 19:19:19) @ 30 & 45 DAT, | 6 |
| Integrated Nutrient Management | Chilli | Balanced nutrient management in hybrid chilli. | 5 |
| Integrated Nutrient Management | Cumin | Low productivity of cumin | 3 |
| Integrated Nutrient Management | Groundnut | Application of Iron source to control chlorosis | 9 |
| Integrated Nutrient Management | Guava | Nutrient Management | 3 |
| Integrated Nutrient Management | Maize | Balanced nutrient management in rabi maize. | 5 |
| Integrated Nutrient Management | Maize | Introduce of balance fertilizers in proper method and time | 5 |
| Integrated Nutrient Management | Maize | Nutrient balance in maize by use of 5 ton FYM + 60 kg N and 20 kg P2O5 and 0.5 % spray of ZnSO4 at vegetative and silk stage | 5 |
| Integrated Nutrient Management | Maize | Low Productivity of maize in sodic soil by use of 50 % GR+ 5 ton vermicompost + 25 kg ZnSO4 / ha at the time of sowing | 5 |
| Integrated Nutrient Management | Mandrin | Technology assesment in Mandarin | 5 |
| Integrated Nutrient Management | Onion | Evaluation of bioagent in production of onion bulb | 3 |
| Integrated Nutrient Management | Onion | Enhancement of onion yield through use of balance fertilizers and micro nutrients in Alwar district | 15 |
| Integrated Nutrient Management | Onion | Nutrient Management | 5 |
| Integrated Nutrient Management | Pearlmillet | Low yield of permillet due to improper fertility management | 3 |
| Integrated Nutrient Management | Pomegranate | Management of fruit cracking and hardening in Pomegranate | 5 |
| Integrated Nutrient Management | Potato | The foliar spray of thio-urea @ 1 gm/l water after 50-60 days after planting alogwith recommended dose of fertilizers(N 150 Kg P 80Kg and K 100 Kg/ha save the potato crop from frost. | 5 |
| Integrated Nutrient Management | Tomato | Yield maximization through soluble NPK spray in tomato | 10 |
| Integrated Nutrient Management | Tomato | Enhancement of Tomato yield through use of balance fertilizers and micro nutrients in Alwar district | 15 |
| Integrated Nutrient Management | Tomato | Balanced nutrient management in tomato. | 5 |
| Integrated Nutrient Management | Tomato | Foliar Spray of Calcium to control the blossom end rot in tomato. | 5 |



| Thematic Area | Crop | Name of the technology | No. of trials |
|-----------------------------------|--------------|--|------------------|
| Integrated Nutrient Management | Wheat | Yield maximization through soluble NPK spray in wheat | 10 |
| Integrated Nutrient Management | Wheat | zinc sulphate as Basal Application @ 25kg/ha and spray @ 0.2% on standing crop at the leaf stage | 5 |
| Integrated Nutrient Management | Wheat | Balanced nutrient management in wheat | 3 |
| Integrated Nutrient Management | Wheat | Yield enhancement of wheat crop through foliar spray of Zinc Sulphate and Thio urea | 3 |
| Integrated Nutrient Management | Wheat | Assessment of IARI liquid bio fertilizer for seed treatment in wheat. | 5 |
| Integrated Nutrient Management | Wheat | Introduce liquid bio fertilizer | 5 |
| Integrated Nutrient Management | Wheat | Effect for VAM for stress mitigation in wheat crop | 6 |
| Integrated Nutrient Management | Wheat | Effect of sulphur on yield and quality in wheat | 6 |
| Integrated Pest Management | Cauliflower | Integrated pest management in early cauliflower | 20 |
| Integrated Pest Management | Chickpea | Pod Borer management | 5 |
| Integrated Pest Management | Chickpea | Termite management in chickpea | 6 |
| Integrated Pest Management | Chickpea | Assessment of Bio-pesticides to control pod borer in Chickpea | 5 |
| Integrated Pest Management | Cluster bean | Management of Aphid | 5 |
| Integrated Pest Management | Cotton | Integrated Pest Managent in Bt cotton | 5 |
| Integrated Pest Management | Ginger | Insecticide/Biopesticide evaluation for soft rot mgt | 10 |
| Integrated Pest Management | Green gram | Management of sucing insect insect pest in moong bean | 3 |
| Integrated Pest Management | Guava | Fruit fly management in guava | 3 |
| Integrated Pest Management | Mandrin | Sucking pest management in Kinnow orchard | 6 |
| Integrated Pest Management | Mandrin | Management of twig blight disease (die back) in kinnow mandarin. | 10 |
| Integrated Pest Management | Mandrin | Bio and Physical approach of Fruit fly managemnet in the Mandarin orheard | 5 |
| Integrated Pest Management | Mustard | Management of mustard aphid, lipaphis erysimi insect pest in mustard | 3 |
| Integrated Pest Management | Mustard | Insecticide assessment for aphid control | 21 |



| Thematic Area | Стор | Name of the technology | No. of trials |
|--|--------------------|--|---------------|
| Integrated Pest Management | Soybean | Assessment of IPM organic modules for management of insect pest in soybean | 5 |
| Integrated Pest Management | Soybean | Control of girdle beetle | 3 |
| Integrated Pest Management | Soybean | Mgt of foliage feeding pest | 3 |
| Integrated Pest Management | Tomato | Low yield of tomato due to fruit borer | 3 |
| Integrated Pest Management | Wheat | Termire control in standing wheat crop | 2 |
| Integrated Pest Management | Wheat | Assessment of seed treatment materials(pesticides) | 5 |
| Integrated Pest Management | Wheat | Insecticide assessment for termite control | 10 |
| Integrated Weed Management | Barley | Weed Management in Barley | 5 |
| Integrated Weed Management | Chilli | Weed management in chilli | 10 |
| Integrated Weed Management | Cluster bean | weed management in rainfed cluster bean | 5 |
| Integrated Weed Management | Green gram | Assessment of Weedicide to control heavy weed infestation in Green gram | 3 |
| Integrated Weed Management | Green gram | Assessment of Weedicide to control heavy weed infestation in Green gram | 5 |
| Integrated Weed Management | Mustard | Management of Orobanche in Mustard | 5 |
| Integrated Weed Management Integrated Weed | Mustard | Management of Orobanche in Mustard | 3 |
| Management Integrated Weed | Mustard Mustard | Management of Orobanche in Mustard Management of Orobanche in Mustard | 5 |
| Management Integrated Weed | Mustard | Management of Orobanche in Mustard | 5 |
| Management Integrated Weed | Pearlmillet | Assessment of 2,4D and foliar spray of urea to | 9 |
| Management Integrated Weed | Potato | control striga Pre emergence Spray of Metribuzin 70% | 6 |
| Management Integrated Weed | Wheat | W.P@0.5 a.ikg /ha Assessment of herbicide for weed control in | 5 |
| Management Others: Role of PGR | | irrigated wheat | |
| | Chilli | Effect of NAA on flowering and fruiting. | 5 |
| Others: Role of PGR | Chilli | Effect of auxin on yield of chilli | 5 |
| Resource conservation technology | Composting | Assessment of Rural Composting method | 5 |
| Resource conservation technology | Mustard | Irrigation Management | 5 |



| Thematic Area | Crop | Name of the technology | No. of trials |
|----------------------------------|-------------|--|------------------|
| Resource conservation technology | Tomato | Product maximization of tomato under drip irrigation with mulch | 3 |
| Resource conservation technology | Wheat | Assessment of soil moisture conservation technologies (Pusa Hydrogel) in wheat crop | 3 |
| Varietal Evaluation | Chilli | Assessment of different genotype of chilli in udaipur district | 10 |
| Varietal Evaluation | Date Palm | Suitable variety of date palm | 4 |
| Varietal Evaluation | Fennel | Assessment of fennel Varieties | 10 |
| Varietal Evaluation | Fenugreek | Assessment of different genotype of fenugreek | 5 |
| Varietal Evaluation | Maize | Assessment of different genotype of maize in udaipur district | 10 |
| Varietal Evaluation | Mustard | Assessment of the feasibility of new mustard varieties in Bundi district | 4 |
| Varietal Evaluation | Mustard | Introduced New Hybrid(varietal Assessment) | 8 |
| Varietal Evaluation | Mustard | new released varieties | 5 |
| Varietal Evaluation | Mustard | Assessment of different genotype of mustard in udaipur district | 4 |
| Varietal Evaluation | Okra | Assessment of different genotype of okra in udaipur district | 10 |
| Varietal Evaluation | Onion | Pre mature initiation of flower stock in onion | 9 |
| Varietal Evaluation | Onion | Assessment of different genotype of onion in udaipur district | 16 |
| Varietal Evaluation | Papaya | To identify suitable variety of papaya for Rajsamand region | 5 |
| Varietal Evaluation | Wheat | Assessment of wheat varieties | 8 |
| Varietal Evaluation | Wheat | Production maximization of wheat under saline/ sodic soil and irrigation water | 3 |
| Varietal Evaluation | Wheat | Assessment of wheat varieties | 6 |
| Varietal Evaluation | Wheat | Assessment of wheat varieties | 5 |
| Varietal Evaluation | Wheat | Assessment of wheat varieties | 3 |
| Rajasthan Total (124) | | | 740 |
| Gujarat | | | |
| Farm machinery | Cumin | Demonstration of cleaner cum grader | 2 |
| Farm machinery | Field crops | Use of bullock drawn seed-cum-fertilizer drill | 3 |
| Farm machinery | Wheat | Assessment of seed bed preparation implements in wheat crop in Bhal region | 5 |
| Farm machinery | Wheat | Use of grain cleaner cum grader | 5 |
| Integrated Crop Management | Castor | Sowing by 150 X 45 cm spacing | 3 |
| Integrated Crop Management | Castor | Apply irrigation at regular interval and spraying of 0.05% plant growth regulator consortia (castor gold) at 25th and 60th DAS | 10 |



| Thematic Area | Crop | Name of the technology | No. of trials |
|----------------------------------|---------------------------------|---|---------------|
| Integrated Crop Management | Chickpea | Identification of irrigation stage in Gram | 3 |
| Integrated Crop Management | Chickpea | Seed bed preparation for Rabi gram | 30 |
| Integrated Crop Management | Chilli | Effect of planting geometry on chili | 3 |
| Integrated Crop Management | Cotton | Assessment of high density planting in Cotton | 3 |
| Integrated Crop Management | Cotton | Assessment of Inter cropping in BT cotton | 3 |
| Integrated Crop Management | Cotton | High density plantation in cotton crop | 5 |
| Integrated Crop Management | Cumin | Effect of seed rate in Maintanance of germination in cumin | 3 |
| Integrated Crop Management | Green gram | Spacing management in summer green gram | 30 |
| Integrated Crop Management | Groundnut + Castor : Relay crop | Kharif: Groundnut + Castor Sowing Relay crop system | 3 |
| Integrated Crop Management | Onion | Evaluation of proper distance in Onion cultivation | 3 |
| Integrated Crop Management | Paddy | To assess the age of seedling for transplanting of paddy crop under salt affected area. | 3 |
| Integrated Crop Management | Paddy | Assessment of aerobic rice in Olpad block of Surat District | 5 |
| Integrated Crop Management | Paddy | Assessment of seed rate for paddy nursery on yield of crop . | 5 |
| Integrated Crop Management | Pomegranate | Mgt. of sun scald and fruit cracking in pomegranate | 3 |
| Integrated Crop Management | Sugarcane | Effect of trimming operation in sugarcane yield | 3 |
| Integrated Crop Management | Sweetpotato | Assessment of production technology of Sweetpotato | 5 |
| Integrated Crop Management | Wheat | To assess the methods of sowing for wheat crop production | 3 |
| Integrated Crop Management | Wheat | Effect of Seed rate on production | 2 |
| Integrated Crop Management | Wheat | Assessment of sowing method in wheat | 10 |
| Integrated Disease Management | Chickpea | Management of wilt in chickpea | 3 |
| Integrated Disease Management | Chilli | Assessment of effect of the bioagent on fungal &bacterial pathogen in chilli | 10 |
| Integrated Disease Management | Citrus | Spraying of Pseudomonas floroscence @ 0.2 % (1 x 109 CFU) (3 spray in June, August and December) | 10 |



| Thematic Area | Crop | Name of the technology | No. of trials |
|----------------------------------|---------------|---|---------------|
| Integrated Disease Management | Citrus | Spraying of Fosetyl-AL 80 % WDG 25 gm / 10 lit water at appearance of disease | 10 |
| Integrated Disease Management | Citrus | Assessment of Fojetile 80% WD funficide for the management of Gummosis diseases in lime | 6 |
| Integrated Disease Management | Citrus | T1: Farmers Practices - Spraying of Copper oxy chloride @ 30 gm/10 lit. water T2: Technology to be assessed - Spraying of Streptomycin sulphate 1 gm+ COC 40gm/10 lit of water (3 spray one each in June, August and December) T3: Technology to be Assessed - Spraying of Pseudomonas fleurocence @ 0.2% (1 × 109 CFU) (3 Spray one each in June, August and December) | 5 |
| Integrated Disease Management | Coriander | Management of powdery mildew in coriander | 5 |
| Integrated Disease Management | Cotton | Lower yield of Bt cotton due to reddening of leaves | 5 |
| Integrated Disease Management | Cumin | Low yield of cumin due to alternaria blight | 5 |
| Integrated Disease Management | Cumin | Seed treatment with Trichoderma viride @ 10g + Pseudomonas fluorescence @ 10g/kg Seed | 3 |
| Integrated Disease Management | Cumin | Seed treatment with thiram @ 5 gm/kg seeds followed by spray of propineb 70% WP, 0.2% with soap solution starting from disease initiation at 10 | 10 |
| Integrated Disease Management | Cumin | Assessment of IDM module for the management of wilt disease in cumin | 8 |
| Integrated Disease Management | Cumin | Integrated wilt management in cumin | 3 |
| Integrated Disease Management | Cumin | Use of Trichoderma for wilt disease management in cumin | 1 |
| Integrated Disease Management | Finger millet | Control of blast disease of Finger millet in the Dangs | 6 |
| Integrated Disease Management | Garlic | Management of purple blotch of garlic | 3 |
| Integrated Disease Management | Groundnut | Integrated management of major diseases of groundnut | 5 |
| Integrated Disease Management | Groundnut | Method of application of Trichoderma against stemrot disease in kharif groundnut | 5 |
| Integrated Disease Management | Potato | Low plant density due to rotting of cut pieces | 5 |
| Integrated Disease Management | Sesame | Management of sesame leaf webber under rainfed condition | 3 |
| Integrated Nutrient Management | Brinjal | Assessment of enrich banana sap for yield and quality of brinjal | 5 |



| Thematic Area | Crop | Name of the technology | No. of trials |
|-----------------------------------|---------------|---|------------------|
| Integrated Nutrient Management | Brinjal | Effect of micronutrients on yield of brinjal | 5 |
| Integrated Nutrient Management | Brinjal | Assessment of Integrated Nutrient Management in brinjal. | 5 |
| Integrated Nutrient Management | Blackgram | 2% DAP spray at appearance of flowering and 15 days after first spray | 10 |
| Integrated Nutrient Management | Castor | Effect of potassium with Zn on yield of castor | 5 |
| Integrated Nutrient Management | Chilli | Effect of zinc in chilly | 5 |
| Integrated Nutrient Management | Citrus | Foliar spray of citrus special @ 5 gm/lit water during November, December, January | 10 |
| Integrated Nutrient Management | Cotton | Assessment of foliar application of KNO3 to increase the yield and quality of Bt cotton in Narmada district | 10 |
| Integrated Nutrient Management | Cotton | Balance fertilization | 2 |
| Integrated Nutrient Management | Cotton | Effect of application of micronutrients on yield of Cotton | 10 |
| Integrated Nutrient Management | Cotton | The Assessment of Spray of 3% KNO3 at flowering, ball initiation and 50% ball formation stage | 10 |
| Integrated Nutrient Management | Cotton | Assessment of nutrient management in Bt cotton | 10 |
| Integrated Nutrient Management | Finger millet | Assessment of use of LBF enriched vermin compost in fingermillet. | 5 |
| Integrated Nutrient Management | Groundnut | Assessment of potassium fertilization to kharif groundnut in calcareous soil | 5 |
| Integrated Nutrient Management | Groundnut | Effect of Bio fertilizer in Groundnut production | 3 |
| Integrated Nutrient Management | Groundnut | Effect of K and gypsum on yield and quality of groundnut | 3 |
| Integrated Nutrient Management | Groundnut | Nutrient management for sustainable groundnut productivity in kharif season | 10 |
| Integrated Nutrient Management | Mango | Intervention: RDF + Banana pseudo stem sap spray 1% before & after flowering | 3 |
| Integrated Nutrient Management | Mango | Assessment of nutrient management in Mango for fruit setting & fruit retention. | 5 |
| Integrated Nutrient Management | Okra | Foliar application of micronutrient (G-4) @ 3 gms/ ltr Of water at 30, 60, 120 DAS at a month interval | 10 |
| Integrated Nutrient Management | Onion | Effect of Sulphur | 2 |
| Integrated Nutrient Management | Paddy | Nutrient management in transplanted paddy | 6 |
| Integrated Nutrient Management | Paddy | Nutrient management in transplanted paddy | 6 |



| Thematic Area | Crop | Name of the technology | No. of trials |
|-----------------------------------|------------|--|------------------|
| Integrated Nutrient Management | Paddy | Assessing performance of leaf colour chart for fertilizer management in Paddy | 5 |
| Integrated Nutrient Management | Pigeon pea | Effect of Banana Pseudo stem enriched sap on Yield of Pigeon pea | 20 |
| Integrated Nutrient Management | Sapota | Increase the productivity of sapota through use of bio fertilizer | 6 |
| Integrated Nutrient Management | Sesame | Effect Of Sulphur on yield of Summer Sesame | 3 |
| Integrated Nutrient Management | Sesame | Assessment of sulphur in Sesamum | 3 |
| Integrated Nutrient Management | Tomato | Integrated nutrient management in tomato | 5 |
| Integrated Nutrient Management | Tomato | Effect of combination of macro and micro nutirients to acquirer higher yield in tomato | 3 |
| Integrated Nutrient Management | Tomato | Nutrient management in tomato | 5 |
| Integrated Nutrient Management | Watermelon | Integrated nutrient management through fertigation in watermelon | 5 |
| Integrated Nutrient Management | Wheat | Effect of liquid bio fertilizer | 2 |
| Integrated Nutrient Management | Wheat | Use of bio fertilizer | 3 |
| Integrated Nutrient Management | Wheat | Effect of multi-micronutrient formulations on Wheat | 5 |
| Integrated Nutrient Management | Wheat | Effect of multi-micronutrient formulations on Wheat | 5 |
| Integrated Nutrient Management | Wheat | Integrated Nutrient Management (INM) in Wheat | 3 |
| Integrated Nutrient Management | Wheat | Response of Bio fertilizer to wheat yield | 3 |
| Integrated Nutrient Management | Wheat | Nutrient management in Wheat crop | 3 |
| Integrated Pest Management | Brinjal | Management of Fruit and Shoot borer in Brinjal | 10 |
| Integrated Pest Management | Banana | Assessment of effective methodology for the management of Banana Pseudo stem weevil | 5 |
| Integrated Pest Management | Castor | Effect of Bio intensive module against Spodoptera litura infesting Castor | 10 |
| Integrated Pest Management | Chickpea | Management of Chickpea Pod Borer, | 10 |
| Integrated Pest Management | Chickpea | Management of Chickpea Pod Borer, | 3 |
| Integrated Pest Management | Chilli | Management of thrips in chilli | 3 |
| Integrated Pest Management | Chilli | Management of sucking pest of chilly | 5 |



| Thematic Area | Crop | Name of the technology | No. of trials |
|----------------------------------|-------------|---|---------------|
| Integrated Pest Management | Cotton | Management of sucking pests in Cotton | 2 |
| Integrated Pest Management | Cotton | Management of sucking pests in Cotton | 3 |
| Integrated Pest Management | Cotton | Management of sucking pests in Cotton | 10 |
| Integrated Pest Management | Groundnut | Managemnet Of Whitegrub in groundnut | 3 |
| Integrated Pest Management | Groundnut | Integrated Pest Management | 3 |
| Integrated Pest Management | Groundnut | Management of whitegrub in groundnut | 5 |
| Integrated Pest Management | Groundnut | Management of whitegrub in groundnut | 5 |
| Integrated Pest Management | Groundnut | Management of whitegrub in groundnut | 3 |
| Integrated Pest Management | Groundnut | Management of whitegrub in groundnut | 1 |
| Integrated Pest Management | Ivy gourd | Efficacy of MAT and BAT on fruit fly in Ivy gourd | 12 |
| Integrated Pest Management | Mango | Assessment of different pesticides for management of hoppers in Mango | 10 |
| Integrated Pest Management | Mango | Assessment of bio-pesticides against inflorescence pests in mango | 5 |
| Integrated Pest Management | Okra | Control of sucking pest in okra | 5 |
| Integrated Pest Management | Okra | Assessment of stem application method of insecticide for management of sucking pest in okra | 5 |
| Integrated Pest Management | Okra | Assessment of field efficancy of bio pesticides against pest complex of Okra | 5 |
| Integrated Pest Management | Pigeon pea | Effect of Bio intensive module against Helicoverpa armigera infesting Pigeon pea | 10 |
| Integrated Weed Management | Pearlmillet | Weed management through weedicide in pearl millet | 5 |
| Integrated Weed Management | Wheat | Assessment of herbicide for weed control in irrigated wheat | 5 |
| Other: Thinning & Pruning | Date Palm | Thinning 1/3 number of fruit in chain in a bunch (Hubbouk : Pea size fruit stage) | 3 |
| Resource conservation technology | Cotton | Plastic Mulching | 3 |
| Resource conservation technology | Cumin | Performance of drip irrigation with sowing method in cumin | 3 |
| Resource conservation technology | Tomato | Evaluation of straw and polythene mulch for enhancing productivity of tomato | 6 |
| Resource conservation technology | Watermelon | Mulching in watermelon | 6 |



| Thematic Area | Crop | Name of the technology | No. of trials |
|----------------------------------|-------------|--|---------------|
| Resource conservation technology | Wheat | Enhancement of wheat yield through Soil application of IBNM with irrigation in Gujarat | 10 |
| Resource conservation technology | Wheat | Assessment of soil moisture conservation technologies (Pusa Hydrogel) in wheat crop | 10 |
| Resource conservation technology | Wheat | Assessment of soil moisture conservation technologies (Pusa Hydrogel) in wheat crop | 10 |
| Resource conservation technology | Wheat | Assessment of soil moisture conservation technologies (Pusa Hydrogel) in wheat crop | 10 |
| Varietal evaluation | Bittergourd | Assessment of Bittergourd variety for management of mosaic disease. | 10 |
| Varietal evaluation | Castor | Performance of Castor hybrid GCH-7 | 5 |
| Varietal Evaluation | Chickpea | Assessment of Gram variety for rainfed rabi cultivation | 3 |
| Varietal Evaluation | Chickpea | Assessment of Gram variety for rainfed rabi cultivation | 10 |
| Varietal Evaluation | Chilli | Varietal assessment of Chilli | 3 |
| Varietal Evaluation | Cowpea | Varietal assessment of Cowpea | 3 |
| Varietal Evaluation | Cucumber | Evaluation of HYV's of cucumber | 5 |
| Varietal Evaluation | Green gram | Varietals Testing of Green gram | 3 |
| Varietal Evaluation | Maize | Varietals Testing of Maize | 3 |
| Varietal Evaluation | Mustard | Evaluation of new salinity tolerant mustard variety (CS 52) | 3 |
| Varietal Evaluation | Okra | Varietal evaluation of okra during Rabi season in the Dangs | 6 |
| Varietal Evaluation | Okra | Varietal Evaluation | 2 |
| Varietal Evaluation | Paddy | Varietal evaluation of paddy | 5 |
| Varietal Evaluation | Paddy | Assessment of paddy variety for kharif cultivation | 10 |
| Varietal Evaluation | Sesame | Varietal assessment of Sesamum Guj Til-4 in Surendranagar district | 3 |
| Varietal Evaluation | Soybean | Assessment of different soybean varieties | 10 |
| Varietal Evaluation | Sweetpotato | Assessment of improved variety | 5 |
| Varietal Evaluation | Tomato | Assessment of tomato variety Arka rakashak | 4 |
| Varietal Evaluation | Tomato | Varietals Testing of Tomato | 3 |
| Varietal Evaluation | Carrot | Assessment of improved variety of carrot | 6 |
| Varietal Evaluation | Cowpea | Assessment of improved variety of cowpea for vegetable purpose | 20 |
| Total Gujarat (139) | | | 814 |
| Grand Total (263) | | | 1554 |

Summary of technologies assessed under livestock by KVKs

| Thematic Area | Name of the livestock enterprise | Name of the technology | |
|------------------------------|---|--|----|
| Rajasthan | | | |
| Feed and Fodder | Buffalo | Improvement of fertility through oestrus synchronization in buffaloes | 8 |
| Nutrition Management | Buffalo | Anoestrus problem in heifer buffalo due to improper feedin practice | 3 |
| Nutrition Management | Buffalo | Management of High calf mortality in buffaloes in Alwar Rajasthan | 15 |
| Nutrition Management | Buffalo | Anestrous management in buffalo, Effect of azolla as feed supplement in milk production | 12 |
| Nutrition Management | Buffalo | Effect of Azoola Feeding in milk yield of Buffaloes | 3 |
| Nutrition Management | Buffalo | Effect of feed additive on milk production in buffaloes | 1 |
| Nutrition Management | Buffalo | Effect on balanced concentrate mixture and bypass protein in buffalo diet. | 3 |
| Production and Management | Buffalo | Low Milk Yield in Buffalo | 15 |
| Production and Management | Buffalo | Mineral Mixture ,Azola & Albendazole | 20 |
| Disease of Management | Buffalo | Problem of anestrous in lactating buffaloes | 6 |
| Production and Management | Cattle | Conservation and preservation of green forage as silage for providing green forage in lean periods to farm animals | 5 |
| Feed and Fodder | Cattle | Effect of supplementary feeding of azolla as concentrate on the milk yield of cattle | 15 |
| Feed and Fodder | Cattle | Imbalance feeding mgt of milch animals | 10 |
| Nutrition Management | Cattle | Low milk yield production in cross bread cow | 3 |
| Nutrition Management | Cattle | Low milk yield in bovine | 3 |
| Nutrition Management | Cattle | The mortality of newly born calves reduced by Coloustrum feeding | 3 |
| Nutrition Management | Cattle | Effect of Mineral Mixture alongwith bypass protein supplement to increase milk production in dairy cattle | 5 |
| Nutrition Management | Cattle | Use of by-pass protein with mineral mixture to increase fat% + SNF% in milk | 6 |
| Nutrition Management | Cattle | Assessment of area specific mineral mixture | 20 |



| Thematic Area | Name of the livestock enterprise | Name of the technology | |
|---|---|--|-----|
| Nutrition Management | Cattle | Impact of Microbial feed supplements to animals on production performance. | |
| Production and management | Cattle | Management of unhygienic cattle feeding | |
| Production and Management | Cattle | ovsynch protocol | |
| Nutrition Management | Cross bred cow | Effect of mineral mixture on the age of puberty of cross bred heifers. | |
| Nutrition Management | Cross bred cow | Effect of chelated mineral mixture on milk yield in cross bred cow | |
| Nutrition Management | Cross bred cow | Improvement of calving cokndition in cross bred cow | |
| Nutrition Management | Goat | Mineral deficiency in goat /buck | 3 |
| Nutrition Management | Goat | Indigenous product goat milk curd as a probiotic to goat kids | 10 |
| Total Rajasthan (27) | | | 240 |
| Gujarat | | | |
| Feed and Fodder | Buffalo | Improving milk production in low producing buffaloes | 30 |
| Health and Disease of Management | Buffalo | Assessment of deworming in buffalo calves to manage the early calf mortality | 10 |
| Nutrition Management | Buffalo | Nutritional, health and seasonal management in dairy animal | 12 |
| Nutrition Management | Buffalo | Assessment of Chelated & Area specific Mineral mixture in dairy buffalo | 1 |
| Nutrition Management | Buffalo | Mineral rich diet | 30 |
| Nutrition Management | Buffalo | Use of green fodder, dry fodder, concentrate with chelated mineral mixture @ 30 gm per day for 90 days | 10 |
| Small Scale income generating enterprises | Buffalo | Increase of Milk production and reduction anoestrous problem in buffaloes by supplementing of bypass protein | 3 |
| Nutrition Management | Buffalo | Improvement of reproductive status of Buffalo by feeding of Bypass fat after de-worming | 10 |
| Nutrition Management | Buffalo | To evaluate the effect of Herbal Seeds on Reproductivity of Buffaloes | 15 |
| Nutrition Management | Calves | T1:Farmers Practices- No use of calf milk replacer / colostrum T2: Technology to be Assessed - Calf milk replacer Feeding @ 10 % of body weight/Animal/day for 60 days | 10 |



| Thematic Area | Name of the livestock enterprise | Name of the technology | |
|------------------------------|---|---|-----|
| Disease of Management | Cattle | Control of Ecto-parasite in cow using tobacco water + mustard oil + common salt | |
| Nutrition Management | Cattle | Use of chelated minerals in the diet of cross bred HF cows | |
| Nutrition Management | Cattle | Nutritional enrichment in local "grass Fatedu" | |
| Nutrition Management | Cross bred cow | | |
| Disease of Management | Cattle | Improvement of milk production and body coat of cross bred cows by control of internal and external parasites | |
| Feed and Fodder | Cattle | Need assessment of microbial feed supplement (Probiotics) | 10 |
| Feed and Fodder | Cattle | Protien and fiber rich diet | 18 |
| Feed and Fodder | Cattle | Reduction of calving interval in crossbred cow. | 3 |
| Feed and Fodder | Cattle | Assessment of chelated mineral mixture | 10 |
| Nutrition Management | Cattle | Assessment of calf milk replacer | 10 |
| Nutrition Management | Cattle | Green & Dry Fodder + Cotton Seed Cake + Wheat Bran + 20 gm Probiotic Powder | |
| Nutrition Management | Cattle | Use of Probiotic in animal feed (Probiotic 20 gm per day for 60 days) | 10 |
| Production and Management | Cattle | To asses the effect of mineral supplement and dewormer on milk production | 10 |
| Feed and Fodder | Cross bred cow | To study effect of feeding urea treated paddy straw and mineral mixture on milk production and general health in crossbred cattle | |
| Nutrition Management | Cross bred cow | Studies on bypass fat feeding and mineral supplementation on milk production in crossbred cattle. | |
| Nutrition Management | Female calf | Mother Milk Feeding + Green & Dry Fodder + Calf Starter upto 6 month of age | |
| Production and Management | Fishries | Pen cultures of Indian Major Carp(IMC) spawn to fry before stocking in village pond/ Reservoir | 3 |
| Production and Management | Fishries | Stocking of Freshwater prawn (Macrobrachiumrosenbergii) with IMC fingerlings in village pond/Reservoir | |
| Disease of Management | Heifer | To assess the bye-pass protein feeding in heifer | |
| Feed and Fodder | Fishries | Effect of vermicompost mixed fish feed on the growth of Indian Major Carps in village pond | |
| Total Gujarat (30) | | | 387 |
| Grand Total (57) | | | 627 |

Summary of Technologies assessed under Home Science / various enterprises by KVKs

| Thematic areas | Name of problem | Name of the technology assessed | No. of trials |
|----------------------------------|------------------------------|---|---------------|
| Drudgery reduction | Women | Management of drudgery reduction in milking women | |
| Nutrition Management | Children | Use of ARF as a weaning food | |
| Nutrition Management | Lactation women | Low status of homoglobin in lactating women due to anemia | |
| Nutrition Management | Anaemia | Assessment of income of farm women involved in value addition of fruit and vegetables | |
| Nutrition Management | Rural adolsent girls | Assessing effect of dietary supplements on iron deficiency anaemia in rural adolescent girls of Rajsamand | |
| Nutrition Management | Weaning Food | Preparation of weaning food (Locally available) for infant health benefit | 9 |
| Value addition | Aonla | Improvement in preparation of instant Amla candy for enhancing its shelf life. | 15 |
| Women and Health | Drum stick leaf powder | Preparation of Drum stick leaf powder as iron source in anemic adolescent girls | |
| Rajasthan Total (8) | | | 134 |
| Drudgery reduction | Improved Sickle | Assessment of different sickle for drudgery reduction | 5 |
| Nutrition Management | Adolescent girls | Anemia prevalence among rural adolescent girls of Bhal region | 15 |
| Nutrition Management | Women | effect assessment of Processed pulse on health of rural women | 15 |
| Nutrition Management | Pre school Children | Low cost high calorie & protein diets made from locally available food materials. | 15 |
| Resource conservation technology | Solar cooker | Assessment of solar cooker as renewable energy source | 5 |
| Resource conservation technology | Solar cooker | Assessment of solar cooker as renewable energy source | 5 |
| Value addition | Mango pickle | Effect of salt and oil on spoilage of mango pickle | 3 |
| Value addition | Mango | Effect of salt and oil on spoilage of mango pickles | 3 |
| Nutrition Management | Adolescent girls | Iron rich diet | 15 |
| Gujarat Total (9) | | | 81 |
| Grand Total (17) | | | 215 |

NOTES



Agrisearch with a Buman touch











ICAR-Agricultural Technology Application Research Institute

CAZRI Campus, Jodhpur - 342 005 Rajasthan, INDIA

Tel.: +91-291-2740516, Fax: 0291-2744367

E-mail: zpd6jodhpur@gmail.com Website: www.atarijodhpur.res.in