वार्षिक प्रतिवेदन 2019 Annual Report



भाकृअनुप-कृषि तकनीकी अनुप्रयोग अनुसंधान संस्थान, क्षेत्र-II ICAR-Agricultural Technology Application Research Institute, Zone-II

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Dr. S.K. Singh Director

PREFACE

Productivity in agriculture is mainly dependent on two sets of factors, they are technological and institutional. Among the technological factors are the uses of agricultural inputs and methods such as improved seeds, fertilizers, improved ploughs, tractors, harvesters, irrigation etc. All these factors help to raise productivity, even if no land reforms are introduced, on the other hand the institutional reforms include the re-distribution of land ownership in favour of the cultivating classes so as to provide them a sense of participation in rural life, improving the size of farms, providing security of tenure, regulation of rent etc.

The emerging need in agriculture today is adoption of location specific skill and knowledge based technologies, promoting greater value addition to agriculture produce through improved post-harvest technologies, agro-processing, new partnership between technology users and corporate sectors, inputs and output marketing chain harness IT more effective to realize financial sustainability and complete not in the domestic but also the international market. Besides, addressing the challenges of the widening farmers-non farmers and rural-urban equity and divides, India is managing 18 percent of the world population (and will soon be the most populous country of world) form only 2.4 percent of world usable land and 4 percent of the world's agriculture water, where the land; man ration is worsening and rural youth population is building and most of them are under employed or unemployed and their employability is low due to poor human resource development spread. The situation is further exacerbated due to shrinking land, water and biodiversity resources and accelerating climate change volatilities and market uncertainties.

Transformation of small farm economy is the biggest challenges for developing economic like India. Small farmers are not homogenous category as some of them have done exceedingly will as compared to others. There are three categories of small farmers (a) succeed as commercial farmers (b) diversifying in rural non-Farm sector and (c) subsistence oriented farmers. Policy may have to be different for each of these categories. Many of small farmers cannot leave agriculture because of lack of opportunities in non-Farm sector. Only option is to organize them into groups to benefit from the cooperative approach and increase their farm income.

The potential of small holders are being realized by empowering them to access the crucial resources viz; land water, energy, credit, insurance markets and appropriate technologies. Small farmers have been provided opportunities to develop skills and access the information where with to use them. They are linked with markets both for products and inputs and reduced market risks and transaction costs.



Enhanced income security, health care and Sani taken, education and social services are the longer ways for empowering the small and marginal farmers.

Agriculture is the dominant sector contributing about 21 percent in net State Domestic Product of Rajasthan as this state is largest state interm of area (10.5 percent) in the country. The growth of agriculture sector in Rajasthan state has improved tremendously in comparison to other state of country. Equality in agriculture sectors across the districts in Rajasthan & Haryana has become important and 63 Krishi Vigyan Kendras are actively involved in addressing of this important issue will cent percent financial supports of ICAR, New Delhi.

Coordination and monitoring of technology application and front line extension education programmes & strengthening of agriculture extension research & data management are the mandate of ICAR-ATARI, Jodhpur.

The KVKs are actively working as link between research institutions and development department for fostering lab to land process and its feedback. Besides, KVKs Directorate of Extension Educations, ICAR institutes and State Agricultural Universities are executing national important programmes likes Mera Gaon Mera Gaurav, Farmer FIRST Programme, Skill Development Programme. KVKs are working as an umbrella for all related agricultural schemes at district level for technology backstopping. The major schemes being implemented by 63 Krishi Vigyan Kendra of Rajasthan (44) Haryana (18) & Delhi (one) are Cluster Front Line Demonstrations on Pules & Oilseeds under National Food Security Mission, Tribal Sub Plan, Demonstration of Climate Resilient Integrated Farming System, Sustainable Livelihood through Skill Development in Rajasthan, Haryana & Delhi, Creation of Seed Hubs for Increasing Indigenous Production of Pulses & Oilseeds in India and National Innovation in Climate Resilient Agriculture, Crop Residue Management, Gramin Krishi Mausam Sewa, Nutri-Sensitive Agriculture Resources and Innovation, Value Addition Technology Incubation Centre in Agriculture, Doubling Farmers Income, Knowledge System Home Stead Agriculture Management in Tribal Areas, Scheduled Caste Sub-Plan, etc.

I express sincere thanks and gratitude to Dr. Trilochan Mohapatra, Secretary, DARE & 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/Administration 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 2019. I express my deep sense of gratitude to all my colleagues of ICAR-ATARI, Jodhpur for providing excellent support, unstinted cooperation, achieving targets and putting in a lot of efforts for bring 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.

S.K. Singh

Place : Jodhpur Date : August 14, 2020

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हर कदम, हर डगर किसानों का हमसफर भारतीय कृषि अनुसंधान परिषद

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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, भाकृअनूप–कृषि तकनीकी अनुप्रयोग अनुसंधान संस्थान, जोधपुर के प्रमुख उददेश्य है। कृषि प्रसार अनुसंधान को मतबूत बनाने के लिए राजस्थान, हरियाणा एवं दिल्ली में कृषि विज्ञान केन्द्रों के माध्यम से कई कदम उठाए गए हैं। दलहन एवं तिलहन के उत्पादन और उत्पादकता में वृद्धि के लिए कृषि विज्ञान केन्द्रों द्वारा राष्ट्रीय खाद्य सुरक्षा मिशन के अतंर्गत प्रथम पंक्ति प्रदर्शनों का आयोजन किया गया। युवाओं को कृषि की ओर आकृषित करना एवं उसमें बनाएं रखना (आर्या) भाकृअनुप की एक अभिनव पहल है जो ग्रामीण क्षेत्र के युवाओं को विभिन्न कृषि एवं उससे संबंधित गतिविधियों में आकृषित करती है और सशक्त बनाती है। किसानों में कृषि तकनीकी की जागरूकता के लिए मेरा गाँव मेरा गौरव कार्यक्रम को प्रारंभ किया गया, जिसे राजस्थान, हरियाणा एवं दिल्ली के भाकृअनूप 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 राजस्थान एवं हरियाणा के 12 कृषि विश्वविद्यालयों / भाकृअनुप के संस्थानों द्वारा क्रियान्वित किया जा रहा है। राजस्थान एवं हरियाणा के 7 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 राजस्थान के 22 कृषि विज्ञान केन्द्रों द्वारा प्रभावी ढ़ग से किया जा रहा है। राजस्थान व हरियाणा के 12 कृषि विज्ञान केन्द्र एकीकृति कृषि प्रणाली मॉडल के सक्रिय क्रियान्वयन में लगे हुए हैं। भारत सरकार के कृषि एवं किसान मंत्रालय, नई दिल्ली के वित्तीय सहयोग से स्वीकृत सीड हब्ब परियोजना राजस्थान के 8 व हरियाणा के 2 कृषि विज्ञान केन्द्रों द्वारा संचालित की जा रही है। वर्ष 2019 के दौरान इन सीड हब्ब केन्द्रों के द्वारा 7502.30 क्विंटल से अधिक चना, मूंग, उड़द और अरहर की किसानों द्वारा पसंद की जाने वाली किस्मों का बीज का उत्पादन किया गया। राजस्थान, हरियाणा एवं दिल्ली के कृषि विज्ञान केन्द्रों, कृषि विश्वविद्यालयों एवं भाकृअनुप के संस्थानों द्वारा 81 कौशल आधारित स्वरोजगार उत्पन्न करने वाले प्रशिक्षण कार्यक्रमों का आयोजन किया गया।

26 जनवरी, 2019 को 5 अग्रणी किसानों को (दो राजस्थान से व तीन हरियाणा) को सबसे प्रतिष्ठित राष्ट्रीय पुरस्कार पदमश्री पुरस्कार से सम्मानित किया गया।

कृषि प्रसार विभाग, नई दिल्ली द्वारा 11 अटारी एवं 9 भाकृअनुप संस्थानों को सम्मिलित करते हुए एक नेटवर्क परियोजना ''नई विस्तार पद्धति और दृष्टिकोण'' को अनुमोदित किया गया। राजस्थान, हरियाणा एवं दिल्ली के कुल 16 केवीके ग्रामीण कृषि मौसम सेवा के अंतर्गत एग्रोमेट वेदर स्टेशन की स्थापना में सक्रिय रूप से शामिल है। संस्थान हरियाणा एवं दिल्ली के 15 केवीके द्वारा मशीनीकरण के माध्यम से राष्ट्रीय परियोजना ''फसल अवशेश प्रबंधन'' के कार्यान्वयन में सक्रिय रूप से शामिल है। रबी 2019 के दौरान कृषकों के खेत पर हैप्पी सीडर के कुल 3400 प्रदर्शनों का आयोजन किया गया।

भाकृअनुप—कृषि तकनीकी अनुप्रयोग अनुसंधान संस्थान, जोधपुर ने राष्ट्रीय एवं अतंर्राष्ट्रीय संस्थानों से कार्यकारी संबंध स्थापित किये है इनमें राष्ट्रीय मत्स्य विकास बोर्ड, राष्ट्रीय कृषि एवं ग्रामीण विकास बैंक, अंतर्राष्ट्रीय अर्द्ध—शुष्क 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 22—24 जून 2019 को महाराणा प्रताप कृषि एवं प्रौद्योगिकी विश्वविद्यालय, उदयपुर (राजस्थान) में किया। राजस्थान, हरियाणा व दिल्ली के 64 कृषि विज्ञान केन्द्रों की गतिविधियों के मूल्यांकन के लिए, 8वीं संस्थान प्रबंधन समिति का आयोजन निदेशक डॉ. एस.के. सिंह के निर्देशन में आयोजित की गई।



कृषि विज्ञान केन्द्र, अनुसंधान संस्थानों तथा किसानों के तकनीकी अपनाने के मध्य की दूरी को कम करने हेतु, 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 385 तकनीकों का आकलन 3925 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 12890 प्रथम पंक्ति प्रदर्शनों का आयोजन 3768.41 हेक्टेयर क्षेत्र में किया गया। इसके साथ ही मुर्गी पालन (152), पशुपालन (397), कृषि यन्त्रों पर (1369) और अन्य गतिविधियों (4352) 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 अनुसंधान संस्थान, जोधपुर के कृषि विज्ञान केन्द्रों द्वारा 6567 प्रशिक्षण कार्यक्रमों का आयोजन किया गया जिसमें 165535 किसानों, ग्रामीण युवाओं और विस्तार कार्यकर्त्ताओं ने भाग लिया। 6567 प्रशिक्षण कार्यक्रमों के आयोजन से 149991 कृषक / महिलाओं की दक्षता में वृद्धि हुई। इन कार्यक्रमों में 31.00 प्रतिशत पिछड़ी जाति / आदिवासी एवं 20.48 प्रतिशत महिला किसानों की भागीदारी रही। ग्रामीण युवाओं के लिए 482 एवं विस्तार कार्यकर्त्ताओं के लिए 295 आयोजित कार्यक्रमों में क्रमशः 9948 ग्रामीण युवा एवं 5596 विस्तार कार्यकर्त्ताओं 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 अनुसंधान संस्थान, जोधपुर एवं प्रसार शिक्षा निदेशालयों द्वारा प्रशिक्षणों का आयोजन किया गया।

विस्तार गतिविधियों में प्रमुखतः किसान मेला (124), प्रक्षेत्र दिवस (1240), किसान गोष्ठी (1130), प्रदर्शनी (448), किसान कार्यशाला (110), विधि प्रदर्शन (1228), समूह बैठकें (913), पूर्व—प्रशिक्षक बैठकें (52), शैक्षणिक भ्रमण (401), सलाहकार सेवा (18290), पशु चिकित्सा शिविर (44), नैदानिक भ्रमण (2105), किसान—वैज्ञानिक वार्ता एवं विस्तार साहित्य, समाचार पत्रों, आकाशवाणी कार्यक्रम आदि के माध्यम से कुल 93537 किसानों एवं 28560 विस्तार कार्यकर्त्ता लाभान्वित हुए। कृषि विज्ञान केन्द्रों द्वारा 25116 मोबाइल संदेशों द्वारा 8765458 किसानो को कृषि सलाह दी गई।

राजस्थान, हरियाणा एवं दिल्ली के कृषि विज्ञान केन्द्रों द्वारा कुल 32935 मृदा / जल / पौधों के नमूनों की जांच की गई, इसमें 22700 मृदा, 7315 जल एवं 2920 पौधों के नमूने जो कि 3948 गाँवों के 58212 किसानों के लिए गए। विभिन्न फसलों के 12961.86 क्विंटल बीज, 1253965 पौध सामग्री क्रमशः 26987 एवं 22355 किसानों को उपलब्ध कराया गया। इसके साथ ही 182833.40 कि.ग्रा. जैविक उत्पादों और 21538 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 संवर्धित उत्पादों की जानकारी व उपलब्धता प्राप्त की गयी।

सह भागीदारी से जगरूकता पैदा करने में कृषि विज्ञान केन्द्रों को अग्रणी माना जाता है। कृषि विज्ञान केन्द्रों द्वारा 24 फरवरी, 2019 को प्रधानमंत्री किसान सम्मान निधि कार्यक्रम, 8 मार्च, 2019 को अन्तर्राष्ट्रीय महिला दिवस 15 अक्टूबर, 2019 को कृषक महिला दिवस, 5 दिसम्बर 2019 को अन्तर्राष्ट्रीय मृदा दिवस का आयोजन किया गया। संस्थान ने 14 से 18 नवम्बर, 2019 को भाकृअनुप–केन्द्रीय भेड़ एवं ऊन शोध संस्थान, अविकानगर, जयपुर में आयोजित खेल प्रतियोगिता में भाग लिया।

कुल 64 वैज्ञानिक सलाहाकार समिति की बैठकों का आयोजन कृषि विज्ञान केन्द्रों द्वारा किया गया, जिसमें भाकृअनुप के संस्थानों, जिला स्तरीय विभागों, प्रगतिशील किसानों और महिला किसानों 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। वर्ष 2019 के दौरान कृषि विज्ञान केन्द्रों को कुल 8868.37 लाख रूपये आवर्ती एवं अनावर्ती मद में स्वीकृत किये गये जिसमें से 8861.80 लाख रूपये दर्ज कर दिये गये।

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ICAR - ATARI-II, Jodhpur



EXECUTIVE SUMMARY

ICAR-ATARI is mandated with ccoordination & 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, Haryana and Delhi. For increasing production & productivity of oilseeds & pulses Cluster Frontline Demonstrations National Food Security Mission are conducted by KVKs. Attracting and Retaining Youth in Agriculture (ARYA) is a major initiative of ICAR to attract and empower youth in rural areas to take up various agriculture and allied activities. Mera Gaon Mera Gaurav, an innovative initiative for creating awareness among farmers on agricultural technologies is being implemented through ICAR institutes and SAUs of Rajasthan, Haryana and Delhi. For enriching knowledge and integrating technology, ICAR commenced the Farmer FIRST programme within National Agricultural Research System and the same is being implemented by 12 ICAR Institute/SAUs of Rajasthan, Haryana and Delhi. National Initiative on Climate Resilient Agriculture (NICRA) is also being implemented through 7 KVKs of Rajasthan and Haryana.

Tribal Sub-Plan scheme is being implemented by 22 KVKs of Rajasthan. Eleven KVKs of Rajasthan and Haryana are actively involved in execution of situation specific integrated farming system models. Ten KVKs are implementing DAC sponsored Creation of Seed Hub Project in Rajasthan and Haryana. Total 7502.03 quintal seeds of green gram, black gram, cowpea and chickpea have been produced during 2019 in a participatory mode. Total 81 courses on various areas of 21 days (200 hours) were organized under collaborative programme (Agriculture Skill Council of India) by KVKs, ICAR Institutes and SAUs of Rajasthan, Haryana and Delhi during 2019.

Five farmers (two from Rajasthan and three from Haryana) have been recognised by National most prestigious Padamshri Award during 26 January, 2019.

A network project "New Extension Methodology and Approach" was sanctioned by Division of Agricultural Extension, ICAR, New Delhi by involving 11 ATARIs and nine ICAR Institutes. Total 16 KVKs of Rajasthan, Haryana and Delhi are actively involved in establishment of Agromet Weather Station under Gramin Krishi Mausam Sewa. Institute is actively involved in implementation of National importance project "In-situ Crop Residue Management through Mechanization by 15 KVKs of Haryana and Delhi. Total 3400 demonstrations on Happy Seeder were organized during Rabi 2019 at farmers fields.

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 MPUA&T, Udaipur during 22-24 June, 2019 to review the achievements of KVKs for the year 2018-19. Institute also organized 8th Institute Management Committee meeting at ICAR-ATARI, Jodhpur on 28th February, 2019 under the Chairmanship of Dr. S. K. Singh, Director. ICAR-ATARI coordinates & evaluates the activities of 63 KVKs functioning in Rajasthan, Haryana and Delhi.



As an innovative and district level farm science center, KVKs reduced time lag between generation of technology at research institutions and its transfer to farmers' field for increasing production, productivity and income from agriculture and allied sectors. Under ATARI, KVKs conducted on-farm testing on 385 technologies through 3925 trials. To demonstrate the proven production potentials of latest location specific technologies in agriculture and allied areas for generating production data and obtaining feedback, 12890 FLDs covering 3768.41 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 dairy (397), poultry (152), farm implements (1369) and others (4352) were successfully conducted. Farm implements were also found to be effective in drudgery reduction, and saving in cost, time and labour.

KVKs of Zone-II organized 6567 training, in which 165535 farmers, rural youths and extension functionaries participated. From organization of 6567 trainings, 149991 practicing farmer's/farm women enhanced the skills. The participation of scheduled castes/tribes and farm women was noted as 31.05 per cent and 20.58 per cent, respectively. Training conducted for rural youths and extension functionaries were 482 and 295 through which 9948 rural youth, 5596 extension functionaries, respectively, got benefited. ICAR-ATARI, Jodhpur and Directorates of Extension Education (SAUs) had conducted 14 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 (1124), field days (1240), kisan gosthies (1130), exhibitions (448), farmers seminar/ workshop (110),

method demonstration (1228), group meetings (913), ex-trainee samellan (52), exposure visits (401), advisory services (18290), animal camps (44), diagnostic visits (2105), interactions, extension literature, print media coverage, broadcasting in electronic media were conducted in which a total of 93537 farmers and 28560 extension personnel participated. KVKs have provided agro-advisory services through 25116 SMS to 8765458 farmers.

A total of 32935 samples comprising 22700 soils, 7315 water and 2920 plant samples of 58212 farmers inhabiting 3948 villages were tested by KVKs of Rajasthan, Haryana and Delhi. A total of 12961.86 q seeds of different crops and 1253965 planting materials were sold to 26987 and 22355 farmers, respectively. In addition to that 182833.40 kg bio-products and 21538 progeny animals and poultry were also produced and sold to farmers. Agricultural Technology Information Centres have provided single window delivery on technologies, information, seeds, planting material and value added products to visiting farmers.

Several other activities viz., National Farm Women Day (15.10.2019), International Soil Day (5.12.2019), International Women Day (08.03.2019), Pradhan Mantri Kisan Samman Nidhi Programme (24.02.2019), etc. were organized. Institute participated in ICAR Zonal Sports Meet during 14-18 November, 2019 at CSWRI, Avikanagar.

In sixty-four 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. 8868.37 lakhs fund was sanctioned in recurring and non-recurring heads for the zone out of which Rs. 8861.80 lakhs were utilized.

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ICAR-ATARI - An Introduction

ICAR-ATARI, Jodhpur is functioning under Division of Agricultural Extension which is one of the eight divisions of Indian Council of Agricultural Research (ICAR), New Delhi. The major programme of Agricultural Extension Division are assessment and demonstration of technology/products through a network of more than 700 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 700 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 11 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 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 of Zone-VI included Rajasthan, Gujarat and Daman & Diu and Dadra & Nagar Haveli. Rajasthan and Gujarat occupies 60% and 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-ZCU, 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 (ORP), Scheduled Caste and Research Project 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 as Zonal Project Directors with 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. During the process ZPD Zone-VI's jurisdiction was revised and in place of Gujarat and Daman & Diu and Dadra & Nagar Haveli; Haryana and Delhi states have been added to this unit and the zone has been renamed as Zone-II.



Mandate of ATARI

- Coordination and monitoring of technology application and frontline extension education programmes.
- Strengthening of agricultural extension research and knowledge management

1.2 Organizational Structure of ICAR-ATARI

The organizational structure of ICAR-ATARI,

Zone-II, Jodhpur and KVK functioning in Zone is depicted in Fig 1.1.

1.3 KVKs functioning under ICAR-ATARI, Jodhpur

A total of 63 KVKs are functioning in ICAR-ATARI, Jodhpur. In Rajasthan, 44 KVKs are working while 18 KVKs are functioning in Haryana state and one KVK is in Delhi for the betterment of the farming community (Table 1.1)



Table 1.1 KVKs under ICAR-ATARI, Jodhpur

State	Number of KVKs	KVKs				Total
		SAUs	NGOs	ICAR	Others	
Rajasthan	44	35	4	3	2	44
Haryana	18	14	2	2	0	18
Delhi	1	0	0	0	1	1
Total	63	49	6	5	3	63



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1.4 Workshop/Meeting/Conference/ Trainings Organized

S.No.	Name of Event	Venue	Duration	No. of participants
1.	State Level Workplan (2019-20) Workshop for KVKs of Rajasthan	Banasthali Vidyapith	21-22 January, 2019	KVKs of Rajasthan
2.	State Level Workplan (2019-20) Workshop for KVKs of Haryana & Delhi	CCSHAU, Hisar	15 th February, 2019	KVKs of Haryana & Delhi
3.	Stakeholders meet on promotion of Crop Residue Management	ICAR-NDRI, Karnal	26 th March, 2019	65
4.	Inauguration of Administrative Building of KVK, Jodhpur-II	KVK, Jodhpur-II (Phalodi)	27 th February, 2019	300
5.	District level Kisan Mela at KVK, Bikaner-II	KVK, Bikaner-II (Lunkaransar)	7 th March, 2019	2100
6.	Annual Review Workshop of 121 KVKs involved in the TDC of NICRA	CRIDA, Hyderabad	4-6 June, 2019	121 KVKs
7.	Institute Research Council Meeting	ICAR-ATARI, Jodhpur	10 th June, 2019	12
8.	Brainstorming Session on "Technological Intervention and Strategies for Farmers' Prosperity in Rajasthan"	NASC Complex, New Delhi	13 th July, 2019	350
9.	Jal Shakti Abhiyan	57 KVKs of Rajasthan, Haryana & Delhi	1 July to 15 September, 2019	40820
10.	Group Meeting of Nodal Officer of KVKs (Rajasthan & Haryana) under NFSM (Pulses)	ICAR-ATARI, Jodhpur	26-27 July, 2019	44 KVKs
11.	Participation of farmers on the occasion of ICAR foundation	NASC Complex, New delhi	16-17 July, 2019	20 farmers of Zone-II
12.	Annual Review Meeting of KVKs under Tribal Sub-Plan (TSP)	ICAR-ATARI, Jodhpur	24 th July, 2019	22 KVKs
13.	Training programme on Oilseed Production Technology	ICAR-ATARI, Jodhpur	26-27 July, 2019	28 KVKs
14.	National Farmers' Conference on In-situ Residue Management	NASC Complex, New Delhi	9 th September, 2019	550 farmers of Zone-II
15.	National Animal Disease Control Program for FMD and brucellosis and Artificial Insemination	61KVKs of Zone-II	11 th September, 2019	51175 farmers
16.	Large-scale tree planation programme	63 KVKs of Zone-II	17 th September, 2019	23433 farmers
17.	Review Workshop of KVKs falling under C & D categories	NASC Complex, New Delhi	18 th September, 2019	KVKs under C & D categories
18.	Mahila Kisan Diwas	61 KVKs of Zone-II	15 th October, 2019	3475 farmers
19.	Zonal Workshop on NFSM-Pulses	AU, Jodhpur	7 th November, 2019	62 KVKs of Zone-II
20.	Skill Development Training of ASCI for Trainers	KVK, Udaipur-I	17-19 December, 2019	49
21.	SAP to commemorate 150 th birth anniversary of Shri Mahatma Gandhi	All the KVKs of Zone-II	02.10.2019 to 01.10.2020	All the KVKs of Zone-II
22.	Fertilizer Application Awareness Programme	All the KVKs of Zone-II	22 nd October, 2019	All the KVKs of Zone-II
23.	4 th Zonal Committee Meeting of ARYA	ICAR-ATARI, Jodhpur	31.12.2019	9 KVKs



1.5 हिन्दी चेतना मास

हिन्दी भाषा को बढ़ावा देने के लिए प्रत्येक वर्ष सितम्बर माह को देशभर में हिन्दी माह के रूप में मनाया जाता है। इसी परिप्रेक्ष्य में सितम्बर, 2019 को भारतीय कृषि अनुसंधान परिषद, नई दिल्ली के निर्देशानुसार भाकृअनुप–कृषि तकनीकी अनुप्रयोग अनुसंधान संस्थान, क्षेत्र–2, जोधपुर (राजस्थान) की राजभाषा समिति द्वारा हिन्दी पर विभिन्न प्रतियोगिताएँ संस्थान में आयोजित की गई। इन प्रतियोगिताओं में संस्थान के सभी अधिकारियों, कर्मचारियों एवं परियोजना सहायकों ने भाग लिया। प्रतियोगिताओं में विजय रहने वाले प्रतिभागियों को सम्मानित किया गया। कार्यक्रम के समापन में प्रोफेसर कैलाश कौशल, विभागाध्यक्ष हिन्दी एवं निदेशक, कमला नेहरू महिला महाविद्यालय, द्वारा "हिन्दी भाषा का कार्यालय में प्रयोग एवं चुनौतियां" पर व्याख्यान भी दिया गया। संस्थान में आयोजित की गई प्रतियोगिताओं का विवरण निम्न प्रकार हैः

क्र.स. प्रतियोगिता

- 1. हिन्दी टिप्पण एवं प्रारूप लेखन प्रतियागिता
- 2. हिन्दी निबंध प्रतियोगिता
- 3. कम्प्यूटर पर यूनिकोड में हिन्दी टाइपिंग प्रतियोगिता
- 4. वाद-विवाद प्रतियोगिता
- 5. हिन्दी-अंग्रेजी अनुवाद प्रतियोगिता
- 6. हिन्दी काव्य पाठ प्रतियोगिता
- 7. प्रश्न मंच प्रतियोगिता

हिन्दी चेतना मास के अवसर पर संस्थान के निदेशक, डॉ. एस.के. सिंह ने संस्थान के सभी अधिकारियों और कर्मचारियों को कार्यालय में हिन्दी में अधिक से अधिक कार्य करने की सलाह दी।



हिन्दी चेतना मास का अटारी जोधपुर में आयोजन

1.6 Organisation of Annual Zonal Review Workshop for KVKs of Rajasthan, Haryana and Delhi during 22-24 June, 2019 at MPUA&T, Udaipur

Annual Zonal Review Workshop for KVKs of Rajasthan, Haryana & Delhi was organized during 22-24, June, 2019.

Dr. A.K. Singh, Hon'ble DDG (Agril. Extn.) being the Chief Guest on 23rd June, 2019 addressed the KVKs and DEEs and appealed KVKs that, technologies are to be transferred to farmers in a faster way as Government of India is emphasizing more and more on KVK system for effective implementation of various schemes so that the KVKs work can be reflected nation-wide. He also emphasized upon creation of farmers database by KVKs so that same farmer is not repeated in several programmes and KVKs should reach more and more farmers, particularly to small and marginal farmers. He also emphasized on ICT tools viz., m-Kisan, enhancement of seed replacement rate of 4%, crop calendar, training of extension personnel, ASCI programmes for skill development, inclusion of new commodities, etc. in a single window manner and KVKs to act as knowledge, resource and capacity centres. He also appealed KVKs to promote custom hiring centres with outsourcing with network of NGOs/Self Help Groups.

Dr. S.K. Singh, Director, ICAR-ATARI, Zone-II, Jodhpur mentioned that KVKs are supposed to implement frontline extension programmes for showcasing technologies in a participatory mode and should act dynamically in their approaches for proper implementation of technology backstopping to strengthen forward & backward linkages on priority



Annual Zonal Workshop of KVKs of Zone-II at MPUA&T, Udaipur

areas and prepare roadmaps. He also highlighted the progress made during 2018-19 of recently launched projects viz., ARYA, CFLDs on pulses & oilseeds, NARI, VATICA, KSHAMTA, CISCA, CRM, Seed Hub, etc. He also appealed the KVKs to address the issues of the Zone viz., low & erratic rain fall, low soil fertility, poor ground water in Rajasthan and soil degradation, inclusion of Maize and short duration green gram for fertility management of soil in ricewheat cropping system of Haryana.

On the occasion more than 15 publications were released including 4 from ICAR-ATARI, Jodhpur. Guest lectures on proven technologies were also presented by Directors of NRCSS, Ajmer and CSWRI, Avikanagar meant for transfer by KVKs.

The workshop was attended by more than 100 participants including 63 KVKs and 7 Directors of Extension Education in which the progress made by KVKs and DEEs for the year 2018-19 were reviewed critically and suggestions were given for further improvement.

1.7 Shri Kailash Choudhary inaugurated New Administrative Building of ICAR-ATARI, Jodhpur

Shri Kailash Choudhary, Union Minister of State for Agriculture & Farmers Welfare inaugurated the newly constructed Administrative Building of ICAR-Agricultural Technology Application Research Institute, Jodhpur on 12th August, 2019. The Minister emphasized upon conserving the preferred varieties of moth bean, mung bean, bajra, etc., in the coming years and making the agriculture as a business model. Shri Choudhary urged the farmers to include the horticulture



Shri Kailash Choudhary inaugurating New Administrative Building of ICAR-ATARI, Jodhpur on 12.08.2019

(vegetable, fruits & flowers) for enhancing the income. He stressed on the income security as well as livelihood security to be addressed by the scientific organizations, especially, ICAR and State Agricultural Universities. Shri Choudhary highlighted the vision of the Hon'ble Prime Minister to form 10,000 Farmer Producer Organisations for augmenting the income of small and marginal categories of farmers. Shri Choudhary also visited the different stalls put by Krishi Vigyan Kendras of Rajasthan. Dr. S.K. Singh, Director, ICAR-ATARI, Jodhpur highlighted the major achievements of 63 Krishi Vigyan Kendras of Rajasthan, Haryana & Delhi.

He also briefed the programme-wise highlights for the farming community's benefits. Dr. Singh also presented the way forward and road map for the augmentation of income, nutritional and livelihood security. He stressed upon executing the Government of India's initiative of "Doubling Farmers' Income by the Year - 2022". Dr. O.P. Yadav, Director, ICAR-Central Arid Zone Research Institute, Jodhpur highlighted the technologies developed by CAZRI, Jodhpur, particularly on Natural Resource Management for the arid zone of Rajasthan. He also emphasized upon including the pulses under the different cropping systems for enhancing the soil fertility as well as nutritional security. Dr. P.K. Rai, Director, ICAR-Directorate of Rapeseed-Mustard Research, Bharatpur underlined the mustard research's achievements for the farming community's benefits. Dr. Gopal Lal, Director, ICAR-National Research Centre on Seed Spices, Ajmer briefed about the importance seed spices in the human diet. He also presented the different technological packages of Cumin for the higher productivity in Jodhpur, Nagaur, Jaisalmer and Barmer Districts of Rajasthan. Dr. A. Sahoo, Director, ICAR-Central Sheep and Wool Research Institute, Avikanagar outlined the Avisan breed of sheep to get the higher remuneration per year basis. He also briefed about the changing scenario of the sheep population and their migration to Telengana and Andhra Pradesh. The KVKs - Tonk, Jaipur-I, Bhilwara-I, Udaipur-I, Barmer-I & II & Jodhpur-I displayed the various exhibits (live and alive) for the farming community's benefits during the event. More than 500 farmers from 11 Districts of Rajasthan participated in the event.

ICAR - ATARI-II, Jodhpur

1.8 Review of performance of KVKs of Rajasthan, Haryana and Delhi by Quinquennial Review Team

Division of Agricultural Extension, ICAR, New Delhi has constituted Quinquennial Review team to assess performance of KVKs across the country since 2011-12 to 2018-19 during June, 2019. QRT constituted to assess performance on different parameters including visibility of technologies in augumentation of income by KVKs of Zone-I, (Ludhiana) and Zone-II (Jodhpur). Six Members including Dr. S. L. Mehta, Chairman; Dr. M. N. Reddy, Dr. S. K. Rout, Dr. M. M. Adhikary, Dr. S. Prabhukumar and Dr. Arvind Kumar, Member Secretary have been acted in QRT. In first phase, QRT meetings and visits were organized at campus of CCSHAU, Hisar, Haryana and KVK, Karnal, Hisar, Fatehabad, Kaithal and Ambala during 25-27, November, 2019.

In the second phase QRT has reviewed performance of KVKs on different indicators during 8 December to 16 December, 2019. KVKs working under jurisdiction of AU, Kota, MPUAT, Udaipur, KVK-Udaipur-I & KVK, Alwar-II presented results in brief and outcomes from 2011-12 to 2018-19 at MPUA&T, Udaipur on 9.12.2019. QRT also visited sites of KVKs, Chittorgarh, Dungarpur, Udaipur-I on 10 December, 2019. QRT visited KVK, Ajmer on 12.12.2019 to see performance of different demonstrations units. Presentations of KVKs of AU, Jodhpur, SKRAU, Bikaner, four NGOs, two ICAR Institutes were made by Heads of KVKs on 13.12.2019 at SKRAU, Bikaner. QRT visited sites of KVKs, Jaisalmer-I & II, Barmer-I & II, Jodhpur-I during 14-16 December, 2019. QRT also interacted with different farmers including Farm Women and Rural entrepreneurs. QRT visited ICAR-ATARI, Jodhpur on



16.122019 and suggested several points for improving functioning of KVKs of Rajastha, Haryana & Delhi. More emphasis has been given on cross learning to acquint about effects of different programmes and activities and strengthening of forward and backward linkages.

1.9 ICAR-ATARI, Jodhpur participated in ICAR Wester Zonal Sports Meet

The nine members' contingent of ICAR-ATARI-II, Jodhpur actively participated in 'ICAR- Western Zonal Sports Meet' held at ICAR-CSWRI, Avikanagar during November 14-18, 2019. The contingent members took part in various events including- Volley Ball (Smashing & Shooting), Shotput Throw, Chess, Badminton, Javelin Throw, etc. and bagged two medals- one in Chess (2nd position) and one in Shotput Throw (3rd position) in women category.



1.10 Awards and recognitions

ICAR National/Zonal Awards for farmers of 2017 were conferred on 5.3.2019 during Pusa Krishi Mela:

On the occasion of 91st ICAR Foundation Day and Award Ceremony the following awards were conferred :

- Pandit Deen Dayal Upadhyay Krishi Vigyan Rashtriya Protshahan Puraskar 2018-Zone II was conferred to KVK, Bundi.
- Jagjivan Ram Abhinav Kisan Puruskar/ Jagjivan Ram Innovative Farmer Award (Zonal) 2018-Zone II was conferred to Sh.Jagdish Prasad Pareek, Vill.-Ajitgarh, Ward No.08, The.-Srimadhopur, Distt.-Sikar, Rajasthan.





Dhanuka Innovative Agriculture Award-2018

Dhanuka Award has been conferred to KVK Churu-I and Jhalawara during 8-9 January, 2020 at NASC Complex, New Delhi

Award of International Society of Noni Science, Channai, India

Dr. S.K. Singh, Director, ICAR-ATARI, Jodhpur has been awarded with Fellowship of International Society for Noni Science, Chennai, India for the year 2019 on 23.03.2019.

ISEE Fellow Award to Dr. S.K. Singh, Director

Dr. S.K. Singh, Director has been conferred with ISEE Fellow Award for outstanding contribution in the field of extension education in the ISEE National Seminar on "Holistic Approach for Enhancing Agricultural Growth in Changing Rural Scenario" held at SKRAU, Bikaner during 14-16 November, 2019.



KRISHI Portal Award - (ICAR Data Repository for Knowledge Management - https://krishi.icar.gov.in/)

ICAR-ATARI-II, Jodhpur has been presented with 'Certificate of Appreciation', during "4th National Workshop of Officer Incharge, Data Management" organized by the ICAR-Indian Agricultural Statistics Research Institute, New Delhi at the National Agricultural Science Centre Complex during Dec 10-11, 2019. The appreciation came for uploading all its publication on KRISHI Portal (ICAR Research Data Repository for Knowledge Management - https://krishi. icar.gov.in/) for last six years. The certificate has been presented by Dr. Trilochan Mohapatra, Secretary-DARE & Director General-ICAR on 10th December, 2019 received by Dr. H N Meena, Sr. Scientist (Agronomy), ICAR-ATARI-II, Jodhpur. This achievement has been made in the guidance of Dr. S K Singh, Director, ICAR-ATARI-II, Jodhpur with continuous and tireless efforts by Dr. M S Meena, Principal Scientists (Agricultural Extension) & Officer In-charge, KRISHI Portal.



Appreciation for In-situ Management of Crop Residue in Zone-II

The ICAR-ATARI-II, Jodhpur has received 'Letter of Appreciation', from Dr. A K Singh, DDG (Agricultural Extension) for lead taken by ICAR-ATARI-II, Jodhpur to address the problem of paddy straw burning through In-situ crop residue management (CRM). The of KVKs of Haryana and Delhi created mass awareness among various stakeholders by conducting demonstrations on farmers' fields, mobilizing school and college students, involving social leaders and by using social, electronic and print media. Kisan Melas on crop residue management theme were also organized to mobilize farmers in this campaign. The efforts of KVKs were coordinated and monitored by ICAR-ATARI-II, Jodhpur in the guidance of Dr. S K Singh, Director, by Dr. H N Meena, Sr. Scientist (Agronomy) & PI, CRM.

1.11 Budget

The details of funds allocation and utilization with respect to ATARI, KVKs and Directorates of Extension Education under different sub-heads for the year 2019 are shown in table 1.2. A total of 8868.13 lakh was allocated during the period under report out of which 8861.80 lakh were spent.

Table 1.2 Fund allocation & utilizat	ion at ATARI. DEEs and KV	Ks for the year 2019	(Rs. in Lakhs)
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	Head	RE 2019-20	Funds received	Expenditure
ATARI, Jodhpur	Grant in Aid capital	93.87	93.87	89.95
	Grant in Aid Salary	194.00	194.00	193.68
	Grant in Aid General (Other than pension & Retirement Benefits)	80.00	80.00	78.67
	Grant in Aid General (Pension & retirement Benefits)	1.00	1.00	0.00
	Total (A)	368.87	368.87	362.30
KVKs + DEEs	Grant in Aid capital	717.33	717.33	717.33
	Grant in Aid Salary	7054.17	7054.17	7054.17
	Grant in Aid General	728.00	728.00	728.00
	Total (B)	8499.50	8499.50	8499.50
ATARI + KVK / DEE	Grant in Aid capital	811.20	811.20	807.28
	Grant in Aid Salary	7248.17	7248.17	7247.85
	Grant in Aid General	809.00	809.00	806.67
	Total (A+B)	8868.37	8868.37	8861.80

1.12 staff strength at ICAR-ATARI, Jodhpur

Total sanctioned staff strength of ATARI, Zone-II, Jodhpur is 18, out of which 12 have been filled up (table 1.3).

1.13 Staff position existing

Existing staff position of ICAR-ATARI, Jodhpur as on 31.12.2019 is presented in table 1.4.

S.No.	Post/Designation	Sanctioned	Filled	Vacant
1.	Director	1	1	0
2.	Principal Scientist	1	1	0
3.	Senior Scientist (Livestock Production & Management)	1	1	0
4.	Senior Scientist (Agricultural Extension)	1	0	1
5.	Senior Scientist (Vegetable Science)	1	0	1
6.	Scientist (Agricultural Extension)	1	1	0
7.	Scientist (Agronomy)	1	1	0
8.	Senior Technical Officer (Computer)	1	1	0
9.	Assistant Finance & Accounts Officer	1	1	0

Table 1.3 Staff strength at ICAR-ATARI, Jodhpur as on 31.12.2019



S.No.	Post/Designation	Sanctioned	Filled	Vacant
10.	Assistant Administrative Officer	1	1	0
11.	Junior Accounts Officer	1	0	1
12.	Assistant	1	0	1
13.	Private Secretary	1	0	1
14.	Senior Clerk	1	1	0
15.	Junior Clerk	2	2	0
16.	Driver	1	1	0
17.	Skill Support Staff	1	0	1
	Total	18	12	6

Table 1.4 Staff Position existing on 31st December, 2019

Category	Name of Staff	Designation
Director	Dr. S. K. Singh	Director
Scientific	Dr P P Rohilla	Principal Scientist (LPM)
	Dr. B. L. Jangid	Principal Scientist (Agril. Extn.)
	Dr M S Meena	Principal Scientist (Agricultural Extension)
	Dr. H. N. Meena	Senior Scientist (Agronomy)
Technical	Sh P K Satapathy	Assistant Chief Technical Officer (Computer)
	Sh Ram Nivas	Driver
Administrative	Sh N S Gehlot	Assistant Administrative Officer
	Sh. Prakash Vimal	Assistant Finance & Accounts Officer
	Sh Rajender Benda	Upper Divisional Clerk
	Sh MukeshTripathi	Lower Divisional Clerk
	Ms. S. Satapathy	Lower Divisional Clerk
Supporting staff		

Table 1.5 Summer of KVK staff position

Category	Rajasthan		Haryana		Delhi		Zone Total					
	S	F	V	S	F	V	S	F	V	S	F	V
Senior Scientist & Head	44	34	10	18	11	7	1	1	0	63	46	17
Subject Matter Specialists	264	175	89	108	76	32	6	6	0	378	257	121
Programme Assistant	132	67	65	54	29	25	3	3	0	189	99	90
Administration	88	35	53	36	20	16	2	2	0	126	57	69
Auxiliary	88	47	41	36	28	8	2	2	0	126	77	49
Supporting	88	61	27	36	19	17	2	2	0	126	82	44
Total	704	419	285	288	183	105	16	16	0	1008	618	390

S: sanctioned, F: filled, V: vacant



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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, Haryana and Delhi during the

monsoon 2019 has been compiled. From these data, average rainfall of Rajasthan, Haryana and Delhi for the monsoon period has been calculated and is presented in Fig.2.1.

Rainfall Pattern and Agricultural Status in Rajasthan, Haryana and Delhi during 2018

The annual rainfall in Rajasthan, Haryana and Delhi during 2019 is given in table 2.1. On the whole western Rajasthan received excess rainfall and in east Rajasthan the rainfall was almost normal in comparison to Haryana and Delhi Regions which received less rainfall than normal.

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 condition by the KVKs are given below.



Fig. 2.1 Average Rainfall During Monsoon 2019 in Rajasthan, Haryana and Delhi





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State	Actual	Normal	Dep%
West Rajasthan	316.1	265.3	19.1
East Rajasthan	920.6	602.9	52.7
Haryana & Delhi	258.6	444.0	-41.8

Table 2.1 Annual Rainfall in mm during monsoon 2019 (Jan to Dec) in Rajasthan, Haryana and Delhi

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, Haryana and Delhi states. In these states, total of 1255.00 ha area have been covered under these varieties during year and 2955 farmers have taken advantage of these varieties. State wise details of crops and their varieties are given in the table 2.2.

Major Area Coverage under Alternate Crops/ Varieties

With the effort of KVKs of the Zone-II farmers have adopted drought tolerating alternate crops and varieties. Total 1434.00 ha area was covered under different category of crops and 3660 numbers of farmers were benefited. State-wise details of area covered under different category of crops and number of farmers is given in table 2.3.

Table 2.2 Introduction to Alternate Crops/Varieties by KVKs

Crops/ cultivars	Variety	Area (ha)	Number of farmers
Rajasthan			
Sesame	TKG-21, RT-351	115.00	275
Blackgram	Pratap Urad-1, PU-31	70.00	180
Green gram	IPM-205-7, GAM-6	240	600
Rajasthan Total		425.00	1055
Haryana & Delhi			
Castor	CH-1	300.00	700
Clyster bean	H.C305	530.00	1200
Haryana & Delhi Total		830.00	1900
Zone Total		1255.00	2955

Table 2.3 Major area Coverage under Alternate Crops/Varieties

Crops	Area (ha)	Number of farmers
Rajasthan		
Oilseeds	360.00	840
Pulses	632.00	1560
Cereals	230.00	630
Vegetable crops	52.00	290
Rajasthan Total	1274.00	3220



Crops	Area (ha)	Number of farmers
Haryana & Delhi		
Vegetable Crops	90.00	310
Bajra	70.00	130
Total Haryana & Delhi	160.00	440
Zone Total	1434.00	3660

Farmers-scientist Interaction on Livestock Management

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, Haryana and Delhi to promote livestock production in the zone. Total 2 interactions were organized in the zone in which 83 farmers participated and get benefited.

Animal Health Camps Organized

A total of 10 animal health camps were organized during the year in the zone. Total number of 1690 animals treated in these camps involving 274 farmers of different categories (small, marginal & landless, medium, large, etc.). The details are given in Table 2.4.

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, mulching, etc. were adopted by farmers in Rajasthan, Haryana and Delhi on large scale is given in the Table 2.5. Total 11332.31 ha area were covered under these technologies with active involvement of 28299 farmers by adopting these resource conservation technologies in the zone.

Table 2.4 Animal Health Camps Organized

State	Number of camps	No. of animals	No. of farmers
Rajasthan	8	1230	190
Haryana	2	460	84
Total	10	1690	274

Table 2.5 Large Scale Adoption of Resource Conservation Technologies

Crops/cultivars and gist of resource conservation technologies introduced	Area (ha)	Number of farmers
Rajasthan		
Sprinkler irrigation	65.00	216
Plastic mulching	36.00	90
Azola Units	0.50	48
Napier Grass	17.00	80
Vermi compost	0.81	30
Intercropping of pulses with oilseeds	90.00	235
Thinning of crops	500.00	1425
Mid season corrections	60.00	150



Crops/cultivars and gist of resource conservation technologies introduced	Area (ha)	Number of farmers
Dust mulching	125.00	300
Weed management	720.00	1740
Life saving irrigations	1820.00	4250
Short duration crops and varieties	123.00	380
Foliar spary of liquid fertilizers	30.00	115
Rajasthan Total	3587.31	9059
Haryana & Delhi		
Laser Leveller	25.00	65
Drip Irrigation in Kinnow	40.00	130
Green Manuring	200.00	405
Fertiliser use on soil test basis	310.00	700
Cultivation of summer moong	1570.00	3800
Happy seeder	4800.00	12120
Crop Residue Management in Paddy		
Zero tillage technology in wheat in non rice wheat system of S-W Haryana	800	2020
Haryana and Delhi Total	7745	19240
Zone Total	11332.31	28299

Awareness Campaign

Awareness campaigns were organized in Rajasthan, Haryana and Delhi, under which various activities were organized like meetings (181), gosthies (28), field days (34), farmer's fair (46), exhibition (50), film shows (68). State-wise details of various activities and number of farmers benefited are given in the table 2.6.

Trainings on Rainwater Harvesting Structure and Micro-Irrigation System

Majority of the area under Rajasthan and Haryana is covered under arid and semi-arid climatic condition, so

Activities	Rajasthan		Haryana & Delhi		Total	
	No.	No. of farmers	No.	No. of farmers	No.	No. of farmers
Meetings	11	1420	170	8680	181	10100
Gosthies	08	390	20	2010	28	2400
Field days	27	1480	7	425	34	1905
Farmers fair	28	10600	18	8240	46	18840
Exhibition	32	4580	18	8240	50	12820
Film show	44	4750	24	2530	68	7280

Table 2.6 Activities Conducted under Awareness Campaign by KVKs



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 14 KVKs conducted 30 training courses for 522 participants including 470 male and 52 female participants. Out of these participants a total of 147 were from SC/ST category including 98 male and 29 female. State-wise details are given in Table 2.7.

Soil Water and Plant Analysis by KVKs

Soil and water testing laboratories have been established in total 63 KVKs and 61 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 32935 samples of soil, water, plant etc received from 58212 farmers belonging to 3984 villages have been analyzed and realized an amount of Rs. 22.40 lakh. Out of these, 22700 were soil samples followed by water (7315) and plant samples (2920).

Table 2.7 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	10	18	290	40	330	80	25	125
Haryana	04	12	180	12	192	18	04	22
Total	14	30	470	52	522	98	29	147

Table 2.7 Trainings on Rainwater Harvesting Structure and Micro-Irrigation System

Table 2.8 Soil Water and Plant Analysis by KVKs

State	Samples	No. of samples	No. of Farmers	No. of villages	Amount realized (Rs.)
Rajasthan Total	Soil	18140	42330	710	1885120
	Water	4125	6240	280	80530
	Plant	780	112	24	32560
	Manure	0	0	0	0
	Total	23045	48682	1014	1998210
Haryana & Delhi Total	Soil	4560	3870	1210	118340
	Water	3190	3700	1240	108680
	Plant	2140	1960	520	14660
	Manure	0	0	0	0
	Total	9890	9530	2970	241680
Zone Total	Soil	22700	46200	1920	2003460
	Water	7315	9940	1520	189210
	Plant	2920	2072	544	47220
	Manure	0	0	0	0
	Total	32935	58212	3984	2239890



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RESEARCH ACHIEVEMENTS, COLLABORATIVE AND SPONSORED PROJECTS

Institute Project, Collaborative & Sponsored Programmes

Institute based projects

3.1 Effectiveness of Indigenous Technical Knowledge (ITKs) in bovine health management

Major health problems have been identified in 5 selected districts were - retained placenta, FMD, bloat, calf scour, external, internal parasites, indigestion, mastitis, ketosis, prolapse of uterus and maggots etc. Some of the ITKs have been found very effective for animal health management. To assess socio-economic status of livestock owners using ITKs for management of livestock health problems data collected from 75 livestock owner of five districts of Rajasthan viz. Alwar, Jaipur, Jodhpur, Kota and Udaipur, respondents by personal interview technique through pre-tested questionnaire were analysed statistically to draw conclusions. The findings are as follows:-

- The average age of livestock owners was found to be 46.50 years and majority (65.33%) was of middle age (36-58 years). Maximum (29.33%) respondents belonged to STs, followed by general (22.67%), and SCs (18.67%) category.
- The average family size was 7.8 members and majority (68.0%) had medium size (4-11 members)



Demo on Livestock ITKs in Jaipur district

family. It was found that 26.67% livestock owners were educated up to secondary, followed by middle (22.67%) and illiterate (18.67%).

- The average livestock herd size was 12.5 livestock units constituted mainly be buffaloes (54.2%), crossbred cattle (35.5%) and indigenous cattle (11.3%). Further, milch animals constituted the main part (37.0%) of the herd, followed by heifers (22.6%).
- Semi-medium (2-4 ha) sized land holding owned by maximum (29.3%) livestock owners, followed marginal (28.0%) and small (21.3%). The average milk production of herd was 26.2 liters and average milk consumption by family was 5.0 liters and average milk sold in the market per family was 21.2 liters.
- Under Extension contacts 38.67% of respondents used village level development agency on weekly basis followed by Dairy Extension Personal (30.67%); while 21.33% farmers visited KVKs fortnightly. Among various mass media sources; TV was used frequently by 44% farmers followed by newspaper (50.67%).



Demo on Livestock ITKs in Kota district



3.2 Impact Assessment of Agricultural Technologies Disseminated by Krishi Vigyan Kendras at Farmers' Fields

Objectives

- To analyze socio-economic profile of farmers'/farm women.
- To assess impact of selected technological interventions by KVKs.
- To study linkages of KVKs with other development organization.
- To test mobile app for effective delivery of agroadvisory services.

Progress made

- Enlisted the various technologies based on livestock (Paravet/Malnutrition);
- horticulture (nursery management/protected cultivation); crop-based varieties; NRM technologies (RCTs/Zero tillage); water conservation (Micro-irrigation); and other enterprises like Beekeeping, Mushroom, Azolla etc.
- Identified the socio-economic variables of farmers for profiling
- Prepared the contents of mobile apps for delivery of agro-advisory services.
- Prepared the list of state development departments; NGOs, ICAR institutes etc. to measure the functional linkages with KVKs.

3.3 Farmers Producers Organization & Farmers Producer Companies Promoted by Krishi Vigyan Kendras: Status, Strengths & Challenges

Data were solicited from 557 members of KKPCL- a FPO promoted by KVK, Bundi. Data are being tabulated to draw the meaningful results; however, some salient features are as given below.

- Members of FPO is aged from 20 to 80 years. However, 71.27% respondents are from 32 to 52 years.
- KKPCL involved 84.56% male members followed by 15.44% women members. Majority of

respondents (82.94%) had educated up to secondary education.

- More than 75% had more than 10 years' experiences in farming, had 3 to 6 members (54%) in their family, and most of them had less than 6 ha land under cultivation.
- Agriculture is the primary occupation of them, more than 95% responded that there is only one earning member in their family.
- For promotion of KKPCL, KVK played an important role in making FPOs, their registration, technical backup, linking with financial institution and many more helps to the FPO.
- FPO needs financial support to expand the activities; training and technical backup for sustaining the FPO.

3.4 Mechanization options for efficient residue management for wheat cultivation in rice-wheat system

Objectives

- 1. To study the impact of different machinery on crop health and its effect on wheat yield
- 2. To study the dynamics of biotic and abiotic stresses
- 3. To assess the changes in soil properties under different residue management options in wheat crop
- 4. To work out the economic profitability and energy saving under conservation agriculture practices.

Research work done during -2019-20

Mechanization options for efficient residue management for wheat cultivation in rice-wheat system

The experiment was conducted during rabi 2019-20 on "Mechanization options for efficient residue management for wheat cultivation in the rice-wheat system" at Ambala, Panipat, and Yamunanagar KVKs. The treatment consisted of five types of machinery alone or in combination in the main plot, three levels of nitrogen fertilizer doses in a subplot. Sowing of wheat was completed at all three KVKs and initial growth parameters was taken upto December, 2019.



Sponsored projects

3.5 National Innovations in Climate Resilient Agriculture

Under NICRA project seven KVKs (5 in Rajasthan and 2 in Haryana) actively involved in carrying out different activities under Technology Demonstration Components comprised of various modules. Under this project 8102 partner farmers (NRM-975, crop production-1140, livestock and fodder production-512, institutional interventions including custom hiring -1821 capacity building-2133, extension activities-1521) were involved.

Natural Resource Management Module: Total 748 demonstrations were conducted, covering 1387.10 ha area which involved 975 practicing farmers of 7 districts. Similarly, interventions on water harvesting and recycling for supplemental irrigation achieved in renovating the old check dams, constructions of new farm ponds and village water ponds involved 36 farmers and covered 59ha area.



Demo on Tubewell Recharge KVK Bharatpur

Interventions on summer deep ploughing which involved 113 farmers covering 93.0ha area. Several demonstrations were conducted on water saving technology using sprinkler, micro and drip-irrigation systems through 218 trials were adopted by 218 farmers covering an area of 326.60 ha during the year 2019-20. Solar animal feed cookers were provided to 10 farmers in NICRA village to save energy and time in animal feed preparation. **Crop Production Modules** were implemented through 1140 demonstrations by KVKs of Rajasthan and Haryana which covered 418.25ha area. On short duration varieties total 10 demonstrations were conducted which covered an area of 4ha; involving Cow pea -RC-19. On drought tolerant varieties total 50 demonstrations were conducted which covered an area of 50ha; including chickpea (GNG-1958), cluster bean (RGC-1066), gram (GNG-2144).



Field Day on wheat : KVK Yamunanagar

Total 15 demonstrations were conducted on stress management in Mustard var.- DRMR IJ-31 and barley variety (RD-2794) which covered an area of 5ha, respectively. The percent increase yield in these crops, respectively recorded 18.77 and 25% as compared to farmers' practice. Total 10 interventions were implemented on location specific inter-cropping system with high sustainable yield index in 4ha area with Green gram (4) + Pearl millet (1) Under less water requiring crop Gram GNG-2144 total 20 demonstrations were conducted in 8.0ha area.

Livestock and Fodder Production: Various livestock related interventions were carried out through 429 demonstrations which covered 1490 different categories of livestock owing to 1981 farmers during the year 2019-20. Established 35 Azolla units, 50 livestock and 35 farmer benefited. Breed improvement porgramme through 9 interventions using Murrah buffalo bull, Tharparkar bull, Jamnapari and Sirohi bucks was initiated in NICRA villages, which involved 375 animals.

Similarly, 2 demonstrations were conducted on 8 livestock with improved animal mangers and model

shelter owing to 2 livestock farmers which improved micro-environment of shed, reduced heat stress and improved livestock health. Further 457 animals were treated in animal health camps organized in the NICRA villages through 149 demonstrations; a significant improvement was recorded in milk production of animals (11.5 to 26.25%) and the overall health of the livestock.

Institutional Interventions: Custom hiring for timely operations, community fodder production, compost-pit and silage making, community seed and fodder bank, kitchen gardens and establishment of bio-gas units etc. (monitoring and technical guidance) covered 278.66ha area of 1821 partner farmers in Rajasthan and Haryana states. Total 5 nutri-gardens have been established which actively involved 5 farm families, respectively. Further, establishment of 9 seed banks helped 9 partner farmers, respectively to get fodder and seed during the scarcity period. NICRA KVKs under ATARI Jodhpur earned total revenue of Rs 1,96,746 through Custom Hiring Centres by which 664 farmers completed different agricultural operations timely covering an area of 864.9ha during the year under report.

Capacity Building Activities: A total of 45 courses were conducted on various thematic areas during the year, in which 2133 partner farmers and farm women (1656 male and 477 female) actively participated. Thematic areas were; crop diversification and management, agricultural farm implements and machineries, NRM, feed, fodder and livestock management, pest and disease management, resource conservation technology, rodent and weed control, nursery raising, vermi-compost, value addition, alternate energy source, human nutrition and child care and drudgery reduction through farm implements for women etc.

Extension Activities: A total of 147 activities were organized on various thematic areas which involved 1521 practicing farmers during the year 2019-20. The major extension activities conducted were on awareness programmes, method demonstrations, exposure, diagnostic field visits, celebration of field and farmers' day, community meeting, group discussion and agroadvisory services etc.

3.6 Farmers FIRST Programme

Farmer FIRST Programme has been implemented at National level successfully in 52 institutes involving ICAR institutes and SAUs under jurisdiction of 11 ATARIs in a participatory approach. Under Farmers FIRST programme various interventions were implemented by partner institutes/ SAUs across the country in four components, viz., Farmer-Scientists interface, Technology Assembling, Application and feeback, scientific institutions and partnership and content mobilization. In Technology Assembling, Application & Feeback component, Natural Resource Management, Crop production, Horticulture, Livestock production and Integrated Farming System, etc., are being undertaken.

Under NRM, total 10 technological components have been finalized to demonstrate under different farming situtations covering 1746 farm families. Total 70 technological intereventions covering cereals, pulses, oilseeds, millets, etc. have been demonstrated covering 3780 farm families in selected districts of Rajasthan and Haryana. Participatory technological components have been decided with active participation of farmers mainly related to livestocks and 25 technological interventions were demonstrated involving 4990 cow, buffaloes, goats, etc. Seven types of Integrated Farming System models have been established at 120 farmers' fields involving crops, vegetables, fodder, livestocks, fruit and agroforestry plants. Different extension activities were carried out through 24 programmes conducted under Farmer FIRST programme involving 3936 partner farmers and farm families all over the country. Overall 136 participatory demonstrations were conducted under different modules involving 14020 practicing farmers and farm families.

The results of participatory demonstrations have shown superiority over farmer practices in terms of productivity enhancement, income augmentation, increase of area under usable technologies, employment generation, etc. Adaptation of Climate Resilient technologies also helped in timely management of production and protection technologies and cost reduction. Farmers have accepted utility of mineral



ICAR - ATARI-II, Jodhpur



Demo on MPMH17 AU Jodhpur

mixture on milk yield and general health of the animals. Average health of the animals was better than before feeding minerals to the milch animals under field conditions.

3.7 National Fisheries Development Board

A collaborative project with NFDB has been started at KVK Sangaria in Rajasthan in 2018-19. Selection of KVK: Under ICAR-ATARI, Zone-II, Jodhpur one Krishi Vigyan Kedra Sangaria of Hanumangarh-I has been selected for implementation of the project during 2018-19. Total budget of Rs 337500 was released to conduct Demonstrations on growth performance of improved fish varieties – Jayanti Rohu /Amur carp. KVK has procured total 20400 Jayanti Rohu fingerlings from 5 demonstrations (4 at farmers' fish pond i.e. Smt. Avtar Kaur, Smt Pramjeet Kaur, Smt Sukhjeet Kaur, Sh Balwant Singh) conducted covering an area of 4.25ha at farmers' fish pond including one



Fish harvest by farmers



Animal Health camp CAZRI

demo at KVK Sangaria (0.30ha) with fingerlings of 20-30 mm size. Observed 71.25% average survival rate, 772.5g average fish weight with an average expenditure of Rs 11690 at farmers' fish ponds.

3.8 Tribal Sub Plan

The Government has special concern and commitment for the well-being of the Socially Disadvantaged Groups including the Scheduled Tribes (STs). This has been sought to be achieved through the Special Component Plan (SCP) for Scheduled Castes, now known as the Tribal Sub-Plan for Scheduled Tribes. ICAR-ATARI, Jodhpur has identified 22 districts in Rajasthan for execution of need based programmes related to agriculture and allied enterprise since April, 2017 under TSP. Based on thorough discussion, action oriented work plans were finalized and KVKs are actively engaged to address different issues related to food, nutritional and livelihood security.

In the year 2019-20 (upto Dec 2019) KVKs conducted 23 On-farm testing and 4779 Frontline demonstrations on tribal farmers' field, organized trainings on improved agricultural practices with participation of 5448 tribal farmers and another 9293 participated in various extension activities. KVKs produced and provided 502 quintal seed of improved varieties, 3,09,323 planting material of horticultural crops and 1802 Live-stock strains and fingerlings to tribal farmers. KVKs also provided mobile advisory to 13447 tribal farmers by issuing 3040 no. of messages.



Majority of KVKs implemented direct benefitting programmes for enhancing income of tribal farm families. Back yard poultry for egg production has been accepted by tribal farm women in 22 districts of Rajasthan. Goat rearing has also been found as income and gainful employment generating activity on sustainable basis. Tribal farmers have been empowered to store at least 10-15 percent produce of demonstrations as seeds.



Distribution of storage-bin and spray instruments to tribal farmers

3.9 Mera Gaon Mera Gourav

'Mera Gaon Mera Gourav (MGMG)' programme is coordinated by the ICAR-ATARI-II, Jodhpur in all the three states viz. Rajasthan, Haryana and Delhi in its jurisdiction. The Rajasthan states has 12 organizations including six ICAR institutes and six SAU's, state of Haryana has two SAU's and six ICAR institutes and state of Delhi has six ICAR institutes. The progress reported by all theses 26 organizations during the year 2019-20 (upto Dec 2019) under MGMG is as under-

- The number of villages covered under MGMG activities across the organizations was 961 with participation of 1,21,380 farmers.
- In these 26 organizations 358 teams of scientists have been formed involving 1,338 scientists. During the period a total of 1,209 visits were made to villages by these teams with participation and benefit to 28,045 farmers.
- Further, 781 interface meeting/ Gosthies /trainings were organized with participation of 20,679 farmers. A total of 2,323 demonstrations were conducted with participation of 11,788 farmers.
- Across the organizations 10,773 Mobile based advisories were issued benefitting 31,293 farmers.
- The Literature support was provided with distribution of 7,014 literatures among 16,348 farmers.

S. No.	Description	Unit	Achievements
1.	On-farm testing (No. of technologies to be taken up for OFT)	Number	23
2.	Frontline demonstrations	Number	4779
3.	Farmers training	Number	5448
4.	Extension Personnel training	Number	164
5.	Participants in extension activities	Number	9293
6.	Production of seed	Quintal	502
7.	Planting material production	Number	309323
8.	Live-stock strains, poultry and finger lings production	Number	1802
9.	Soil, water, plant, manures samples tested	Number	1690
10.	Mobile agro- advisory (No. of messages)	Number	3040
11.	Mobile agro- advisory to farmers (No. of farmers)	Number	13447

Table 3.1 Achievement of ICAR-ATARI-II, Jodhpur under Tribal Sub Plan during the year 2019-20 (Up to Dec 2019)



- General Awareness creation activities in tune of 890 were organized with participation of 2,14,023 farmers.
- During the period of reporting 463 Linkages were developed by these organizations with other agencies benefitting 15,090 farmers.
- These 26 organizations facilitated for adoption of 130 new varieties among 2809 farmers.
- Seeds in tune of 4,034 quintals was provided among 11,599 farmers and 176 technologies were disseminated among 4,093 farmers.



Demonstration in MGMG programme

3.10 'Model Organic Farming'- a sub scheme under 'Paramparagat Krishi Vikas Yojana'

'Model Organic Farming'- a sub scheme under 'Paramparagat Krishi Vikas Yojana', is being implemented by 57 KVKs of ATARI-II, Jodhpur, viz. Ajmer, Alwar-I, Alwar-II (Gunta), Ambala, Banswara, Baran, Barmer-I (Danta), Barmer-II (Gudamalani), Bharatpur, Bhilwara, Bhiwani, Bikaner-I, Bikaner-II, Bundi, Chittorgarh, Churu-I (Sardarshagar), Churu-II (Chand Gothi), Dausa, Delhi (Ujwa), Dholpur, Dungarpur, Faridabad, Gurugram, Hanumangarh-I (Sangaria), Hanumangarh-II, Hisar, Jaipur-I (Chomu), Jaipur-II (Kotputali), Jaisalmer-I, Jaisalmer-II (Pokaran), Jalore, Jhajjar, Jhalawar, Jhunjhunu, Jodhpur-I, Jodhpur-II (Phalodi), Kaithal, Karauli, Kota, Kurukshetra, Mahendergarh, Nagaur-I, Nagaur-II, Pali, Panipat, Pratapgarh, Rajsamand, Rewari, Rohtak, Sawai-Madhopur, Sikar, Sirohi, Sonipat, Sriganganagar, Tonk, Udaipur-I, Yamunanagar. Out of these 57 KVKs 42 are from Rajasthan, 14 From Harvana and 1 from the Delhi state.

Each KVKs is developing 'Model Organic Farming' block of a 20 ha area as per the guideline provided by the Department of Agriculture and Farmers Welfare, Govt. of India.

The support under the programme for developing 1 ha area for organic farming is \gtrless 16,500.00 per ha, and out of it \gtrless 12,000.00 has to be transferred to the bank account of farmers through DBT after verification of implementation of planned activities by KVKs. During the year 2019-20 fund of \gtrless 1,88,10,000.00 (Rupees One crore eighty eight lakhs and ten thousand only) has been released to KVKs of ATARI-II, Jodhpur @ \gtrless 3,30,000.00 (Rupees three lakhs thirty thousand only).

The programme has been implemented by all the KVKs w.e.f. from Rabi 2019-20 with formation of clusters of 20 ha area. The selected farmers have been made aware about 'Organic Farming' by organizing awareness activities and subsequently they have been convinced to bring 1 ha area of their farm under organic cultivation. The most of KVKs have implemented the programme by developing single compact clusters but some have taken up it on 2-3 cluster with number of villages ranging from one to 4-5 villages.

The selected farmers in cluster were advised and facilitated by KVKs for purchase of organic inputs and develop basic infrastructures at their farm viz. Vermicompost unit. The various organic inputs purchased included seeds, vermi-compost, biofertilzers, organic/bio pesticides etc.

3.11 Collaborative Network project 'New Extension Methodologies and Approaches (NEMA)'

Collaborative Network project 'New Extension Methodologies and Approaches (NEMA)' is being implemented by 19 organizations of ICAR including Agricultural Extension Division, ICAR, Head Quarters, New Delhi, ICAR- Indian Agricultural Research Institute, New Delhi, ICAR-Indian Institute of Horticultural Research, Bengaluru, ICAR-Central Arid Zone Research Institute, Jodhpur, ICAR-National Rice Research Institute, Cuttack, ICAR-Central Institute of Freshwater Aquaculture, Bhubaneswar, ICAR-National Dairy Research Institute, Karnal, ICAR- Indian Veterinary Research Institute, Izatnagar, ICAR- Agricultural Technology Application Research Institute, Ludhiana (Zone-1), ICAR-Agricultural Technology Application Research Institute, Jodhpur (Zone-2), ICAR-Agricultural Technology Application Research Institute, Kanpur (Zone-3), ICAR-Agricultural Technology Application Research Institute, Patna (Zone-4), ICAR-Agricultural Technology Application Research Institute, Kolkata (Zone-5), ICAR-Agricultural Technology Application Research Institute, Guwahati (Zone-6), ICAR-Agricultural Technology Application Research Institute, Umiam (Zone-7), ICAR-Agricultural Technology Application Research Institute, Pune (Zone-8), ICAR-Agricultural Technology Application Research Institute, Jabalpur (Zone-9), ICAR-Agricultural Technology Application Research Institute, Hyderabad (Zone-10) and ICAR-Agricultural Technology Application Research Institute, Bengaluru (Zone-11).

The PI of the project is located at ICAR-Indian Agricultural Research Institute, New Delhi, for technical programme implementation and ICAR-Agricultural Technology Application Research Institute, Jodhpur (Zone-2), has been given the responsibility of Financial coordination and release of fund.

The fund as per RE 2019-20 has been released to all the collaborative centres. The ICAR-ATARI-II has received the sampling plan with detail of villages for collection of primary data from eight districts in the state of Haryana for IARI technologies. The data collection work is in progress with help of KVKs located in the selected district. At the same time data compilation is also in progress for KVKs who has completed the data collection work.

3.12 Scheduled Caste Sub Plan (SCSP)

The strategy of Scheduled Caste Sub Plan (SCSP) since evolved in 1979 is aimed at: (a) Economic development through beneficiary oriented programmes for raising their income and creating assets; (b) Bastioriented schemes for infrastructure development through provision of drinking water supply, link roads, housesites, housing etc. (c) Educational and Social development activities like establishment of primary schools, health centers, vocational centers, community halls, women work place etc. The strategy of Scheduled Caste Sub Plan envisages to channelise the flow of outlays and benefits from all the sectors of development in the Annual Plans of States/UTs and Central Ministries at least in proportion to their population both in physical and financial terms.

Scheduled Caste Sub Plan (SCSP) is being implemented by five KVKs under ATARI-II, Jodhpur. Out of which three KVKs are from Rajasthan state viz. Churu-I, Sriganganagar, Hanumangarh-I, and two from Haryana state viz. Ambala and Yamunanagar.

During the year (up to Dec 2019) under SCSP 329 Farmers & farm women trained by KVKs. KVKs conducted 12 OFTs and 335 FLDs of proven technology at the field of Scheduled Caste farmers'. KVKs produced 171 q seed material under SCSP and provided to farmers. Further, KVKs produced 5455 Planting materials including fruit plants of guava, citrus, papaya, anola etc. and provided to 210 farmers. KVKs tested 126 soil samples and Soil Health Cards issued to the farmers.

3.13 Agromet Advisories at Block level under Gramin Krishi Mausam Seva (GKMS) scheme

Government of india has entrushed upon the India Meteorological Department (IMD) the task of establishing weather observing system and development of Gramin Krishi Mausam Sewa in the country. In pursuance here of IMD has set up in the country a network of about 130 Agro-Meteorological Field Units (AMFUs) which are multidisciplinary units responsible for preparation and dissemination of district and sub-district agromet advisories. These AMFUs are located at State Agricultural Universities, ICAR centres and other institutions. Each AMFU utilizes the relevant output products including weather data from conventional/automatic weather station (AWS) provided by IMD and ICAR to generate specific advisories for agricultural management for the respective districts of Agro-Climatic Zones identified under the area of its jurisdiction and disseminate the same to the farming community. Under the Gramin Krishi Mausam Sewa, the IMD proposes to establish District Agro Met Units (DAMU) in 530 districts, in addition to already



operating 130 AMFUs, in order to meet the said expansion. Among other responsibilities, DAMU will receive weather forecast from IMD to prepare and Disseminate sub- districts level agro met advisory bulletins. 16 KVKs selected in Zone-II to establish unit during 2018-19.

- In this project two-days training programme on "Capacity building on agromet advisory preparation" is to be organised for all the senior scientist & Head of all the KVKs of Rajasthan, Haryana and Delhi.
- Selection of subject matter specialist and agro met observer is completed at all the KVKs of all the universities of Zone-II. Orientation training for selected SMS of different KVKs were also organised for six days during 29 July, 2019 to 3 August, 2019 at IARI, New Delhi with the collaboration of IMD, New Delhi.

3.14 Promotion of agricultural mechanization for insitu management of crop residue in the states of haryana and NCT of delhi

Introduction:

In Haryana, 58 per cent of cultivated area is under rice-wheat cropping system The burning of one ton of paddy straw resulted into loss of approximately 5.5 kg N, 2.3 kg P_2O_5 , 25 kg K_2O , 1.2 kg S, 50-70% of micronutrients absorbed by rice, 400 kg of carbon and releases 3 kg particulate matter, 60 kg CO, 1460 kg CO₂, 199 kg ash and 2 kg SO₂.

To address this menace, Govt. of India has initiated Central Sponsored Scheme entitled, "Promotion on Agricultural Mechanization for In-situ Management of Crop Residue in the state of Punjab, Haryana, Uttar Pradesh and NCT of Delhi" with an outlay of 1152 crores for this scheme. Information, Education and Communication (IEC) is the important component of this scheme and state agri. departments/ KVKs, ICAR Institutes and SAUs are the important partners in this endeavour.

Therefore, in view of above and in pursuance to the Budget 2019-20 announcement regarding a special Scheme to support the efforts of the governments of Haryana, Punjab, Uttar Pradesh and the NCT of Delhi to address air pollution and to subsidize machinery required for management of crop residue.

Procurement of Agricultural Machinery and Equipment for In-situ Crop Residue Management Machinery is as under:

For implement on of this project smoothly procurement of agricultural machinery and equipment's for In-situ crop residue management was most priority work and six five different types of agricultural machineries were purchased at all the selected KVKs. where this project was initiated i.e. Happy seeder, Reversible MB Plough, Paddy straw chopper/Shredder/ Mulcher, Zero till drill, Rotavator, and Tractor.

S. No.	Name of machines	No. of machines required	Achievement	Estimated cost (Rs. in Lakh)
1	Happy seeder	26	26	39.26
2	Reversible MB Plough	11	11	19.80
3	Paddy straw, chopper/shredder/ mulcher	8	8	17.20
4	Zero till drill	33	32	17.82
5	Rotavator	20	21	19.40
6	Tractor	9	9	54.00
	Total	107	107	167.48

Table 3.2 Detail of Agricultural Machinery and Equipment of all the KVKs during 2019-20



Major IEC activities conducted to reduce rice straw burning:

Advertisement, Award and Awareness Camps Organized:

Advertisement in print media, Award and Awareness camps organized in different KVKs of state Haryana and Delhi. KVKs distribute No. of advertisement (40), Award (2) for village /Gram Panchayat for achieving zero stubble burning and also Awareness camps (216) organised District level, Block level and village /panchayat level in which Farmer (25768) were took part.

Kisan Mela

KVKs organized (15) Kisan Mela in their respective districts of Haryana and Delhi. About 21375 farmers from selected & nearby villages were participated and get benefited by seeing live demonstrations of machineries which were used in crop residue management after harvesting of rice. In reference that articles (65) in newspaper and magazines, Hording (258), Number of wall writing (525), posters (700), Publicity material (40000) such as leaflets/ pamphlets distribute and awareness through TV & Radio Jingles (7) organised by KVKs of Haryana and Delhi.

	Table 5.5 Detail of the activities conducted by KVKs during 2015					
S.No.	Particulars	Activities	No. of Participants			
1	Awareness programmes conducted at Village Panchayat/ Block/ District Level	216	25768			
2	Training Programmes conducted	45	1170			
3	Kisan Melas organized	15	21375			
4	Mobilization of schools and colleges through essay completion, painting, debate etc.	176	7287			
5	Demonstration conducted (ha)	698	935			
6	Exposure visits organized	50	2450			
7	Field days organized	8	170			
8	Harvest days organized	0	0			
9	Advertisement in Print media	40				
10	Column / Articles in newspaper and magazines etc.	65				
11	Hoarding fixed (at Mandi/ Road side/Market/Schools/Petrol pump/ Panchayat etc.)	258				
12	Poster/Banner placed	700				
13	Publicity material - leaflets/ pamphlets etc. distributed	40000				
14	TV programmes/ panel discussions Doordarshan/ DD-Kisan and other private channels	18				
15	Jingles on radio/ TV, Scroll message on TV and Audio -Visual clips	7				
16	Wall writing	525				
17	Award for village/ Gram Panchayat for achieving zero stubble burning	2				

Table 3.3 Detail of IEC activities conducted by KVKs during 2019

Mobilization of School and College students

Youth are defined as the group of people who are between childhood and adulthood, aged 15 to 29 in the national youth policy. Different KVKs of different districts of Haryana and Delhi selected (176) school and colleges for mobilization of students through essay competition, painting, debate etc. about (7287) student participated for creating awareness on In-situ crop residue management.



Demonstrations

KVKs conducted 698 ha. area demonstrations in their respective districts of Haryana and Delhi. about 935 farmers to participated in selected villages of each district, direct sowing of wheat after harvesting of rice. Technical and scientific know-how regarding demonstrations of sowing of wheat after in-situ management of paddy residues through suitable combination of machinery were also appraised to the farmers.

Training Programme

To empower the district paddy growing farmers and improve technical competence, five-day trainings were organized by KVKs in collaboration with State Department of Agriculture (DDA). Total (45) training programmes were organized in which (1170) trainees Participated in training. The resource persons from State Department of Agriculture were also involved to provide necessary technical know-how on schemes & subsidies on crop reside management machinery and on custom hiring center establishment to the farmers. Mostly skill oriented participatory training programmes were organized.

Exposure visits

KVKs organized (50) exposure visits about (2450) farmers were benefited and (18) TV programmes / panel discussions Doordarshan / DD-Kisan and other private channels in the state of Haryana and Delhi.

Field and Harvest days

KVKs organized (8) field days in slected village about (170) farmers were benefited in the state of Haryana and Delhi.



Crop Residue Management Activities in Haryana

3.15 Cluster Frontline Demonstrations on Oilseeds under National Food Security Mission

National Food Security Mission (NFSM) as a centrally sponsored scheme was launched in XIth plan period (October 2007). This mission is being continued during 12th Five Year Plan with the new targets. The specific objectives of NFSM are as:

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

Department of Agriculture & Cooperation (DAC)–ICAR collaborative project "Cluster Frontline Demonstrations on Oilseeds Production Technology" is being implemented with the active involvement of Division of Agricultural Extension, ICAR, New Delhi through a network of KVKs across the country since October 2015. Total 63 KVKs including 44 KVKs from Rajasthan 18 KVKs from Haryana and 1 KVK from Delhi are actively involved in conductance of CFLDs in Kharif and Rabi season.

During Rabi 2018-19 total 3308 CFLDs in 1403.00 ha area in Rajasthan, 1338 CFLDs in 628.00 ha area in Haryana and 106 CFLDs have been implemented in 42.40 ha area in Delhi state. During Kharif-2019 total 1284 CFLDs 517.30 ha area in Rajasthan and 152 CFLDs have been implemented in 70.00 ha area in Haryana state. During Rabi-2019-20 total 2321 CFLDs in 976.00 ha area in Rajasthan, 352 CFLDs in 150.00 ha area in Haryana and 60 CFLDs have been implemented in 24.00 ha area in Delhi state.

From Rabi 2018-19 to Kharif 2019 total 6188 CFLDs have been implemented at farmers' field in 2661.20 ha area in Rajasthan and Haryana state. Due to the yield enhancement, a total of Rs 3.98 crore have been earned as net profit by farmers in comparison of their local practice.


State	Season	Impleme	nted
		Area	CFLDs
Rajasthan	Rabi 2018-19	1403.50	3308.00
Haryana	Rabi 2018-19	628.00	1338.00
Delhi	Rabi 2018-19	42.40	106.00
Rajasthan	Kharif 2019	517.30	1284.00
Haryana	Kharif 2019	70.00	152.00
Rajasthan	Rabi 2019-20	976.00	2321.00
Haryana	Rabi 2019-20	150.00	352.00
Delhi	Rabi 2019-20	24.00	60.00
	Total	3811.20	8921.00

Table 3.4 Targets and achievement of CFLDs on Oilseeds under NFSM during 2018-19 (Rabi) & 2019-20 (Kharif & Rabi)

Table 3.5 Crop wise contribution of CFLDs in economy of Rajasthan and Haryana states during 2018-19 (Rabi 2018-19 & Kharif 2019)

Сгор	Area (ha)	No. of CFLDs	Avg., yield of Farmers practice (q/ha)	Avg., yield of CFLDs (q/ha)	Average selling price (Rs.)	Total selling amount of Farmers' practice (in Rs.)	Total selling amount of CFLDs produce (Rs.)	Income increase (CFLDs- Farmer's practice) (in Rs.)
Rajasthan state								
Mustard	1403.50	3308	15.26	19.30	3809.08	81580628.08	103178644.95	21598016.87
Groundnut	285.30	724	20.59	24.76	4607.58	27066431.60	32548074.13	5481642.53
Soybean	60.00	145	9.76	12.21	3645.28	2134675.97	2670532.13	535856.16
Sesame	172.00	415	3.61	4.82	7321.15	4545848.46	6069526.20	1523677.74
Haryana state								
Mustard	628.00	1338	18.76	22.44	4142.20	48800418.02	58373207.90	9572789.89
Sesame	70.00	152	3.40	4.23	9272.06	2206750.28	2745456.97	538706.69
Delhi state								
Mustard	42.40	106	19.00	22.80	3500.00	2819600.00	3383520.00	563920.00
Grand Total	2661.20	6188	-	-	-	169154352.40	208968962.30	39814609.88
Average	-	-	12.91	15.79	5185.34	-	-	-

During implementation of CFLDs at farmer's fields, KVK scientists mobilized farmers to kept 5 to 23% CFLDs produce as seed. Due to efforts of KVK scientists,

farmers agreed and they kept 8601.17 q CFLD produce as seed for next season.



S. No.	Сгор	Area Implemented (in ha.)	Average yield (q/ha)	Total production (in q)	Produce kept as seed (in q.)	%	Area covered (in ha.)
Rajast	han state						
1	Mustard	1403.50	19.3	27087.55	4063.13	15.00	67718.83
2	Groundnut	285.30	24.76	7064.028	1743.51	25.00	2179.39
3	Soybean	60.00	12.21	732.60	168.50	23.00	280.83
4	Sesame	172.00	4.82	829.04	74.61	9.00	1865.25
Harya	na state						
1	Mustard	628.00	22.44	14092.32	2536.62	18.00	42277.00
2	Sesame	70.00	4.23	296.1.0	14.80	5.00	370.00
Grand	Total	2618.80	-	50101.64	8601.17	-	114691.30
Averag	ge	-	14.63	-	-	15.83	-

Table 3.6 Increasing SRR & horizontal expansion of Oilseeds in Rajasthan & Haryana during 2018-19 (Rabi 2018-19 & Kharif 2019)

3.16 Cluster Frontline Demonstrations on Pulses Production Technology

National Food Security Mission (NFSM) as a centrally sponsored scheme was launched in XIth plan period (October 2007). This mission is being continued during 12th Five Year Plan with the new targets of additional production of 4 million tons of pulses. The specific objectives of NFSM are as:

- 1. Increasing production of pulses through area expansion and productivity enhancement in a sustainable manner in the identified districts.
- 2. Restoring soil fertility and productivity at then individual farm level;
- 3. Enhancing farm level economy (i.e. farm profits) to restore confidence amongst the farmers with increasing Seed Replacement Rate (SRR) under pulses crop.

Department of Agriculture & Cooperation (DAC)-ICAR collaborative project "Cluster Frontline Demonstrations on Pulses Production Technology" is being implemented with the active involvement of Division of Agricultural Extension, ICAR, New Delhi through a network of KVKs across the country since October 2015. Total 62 KVKs including 43 KVKs from Rajasthan 18 KVKs from Haryana and 1 KVK from Delhi are actively involved in conductance of CFLDs in Kharif, Rabi and Spring/Summer season.

During Rabi 2018-19 total 4281 CFLDs in 1798.00 ha area in Rajasthan, 621 CFLDs in 290.60 ha area in Haryana and 34 CFLDs have been implemented in 13.70 ha area in Delhi state. During summer-2019 total 219 CFLDs in 70.00 ha area in Rajasthan and 1224 CFLDs have been implemented in 593.60 ha area in Haryana state. During Kharif-2019 total 2280.00 CFLDs 912.16 ha area in Rajasthan and 142 CFLDs have been implemented in 80.00 ha area in Haryana state. During Rabi-2019-20 total 2321 CFLDs in 976.00 ha area in Rajasthan and 352 CFLDs have been implemented 150.00 ha area in Haryana.

From Rabi 2018-19 to Kharif 2019 total 8309 CFLDs have been implemented at farmer's field in 3554.46 ha area in Rajasthan and Haryana state. Due to the implementation of proven and region-specific production technologies at farmers' fields resulted enhancement in yield of pulse crops. Due to the yield



State	Season	Imple	mented
		Area (ha)	CFLDs (No.)
Rajasthan	Rabi 2018-19	1798.00	4281.00
Haryana	Rabi 2018-19	290.60	621.00
Delhi	Rabi 2018-19	13.70	34.00
Rajasthan	Summer 2019	70.00	219.00
Haryana	Summer 2019	593.60	1224.00
Rajasthan	Kharif 2019	912.16	2280.00
Haryana	Kharif 2019	80.00	142.00
Rajasthan	Rabi 2019-20	976.00	2321.00
Haryana	Rabi 2019-20	150.00	352.00
	Total	4884.06	11474.00

Table 3.7 Targets and achievement of CFLDs on Pulses under NFSM during 2018-19 (Rabi) & 2019-20 (Kharif & Rabi)

Table 3.8 Contribution of CFLDs in economy of Rajasthan and Haryana states during 2018-19 (Rabi 2018-19 & Kharif 2019)

Сгор	Area (ha)	No. of CFLDs	Avg., yield of farmers practice (q/ha)	Avg., yield of CFLDs (q/ha)	Average selling price (Rs.)	Total selling amount of farmers' practice (in Rs.)	Total selling amount of CFLDs produce (Rs.)	Income increase (CFLDs- Farmer's practice) (in Rs.)
Rajasthan state								
Chickpea	1780.00	4236.00	14.41	18.45	4382.17	112401784.06	143914844.97	31513060.91
Green gram	475.00	1136.00	5.86	7.61	6279.75	17479684.13	22699726.31	5220042.18
Black gram	260.00	688.00	4.26	4.37	4685.45	5189604.42	5323608.29	134003.57
Moth bean	177.16	456.00	3.92	5.03	4889.85	3395840.43	4357417.70	961577.27
Hary	vana state							
Chickpea	268.70	569.00	14.23	17.81	5016.16	19179794.39	24005069.43	4825275.05
Green gram (Summer)	593.60	1,224.00	5.43	6.55	5,090.75	16408749.76	19793243.26	3384493.50
Grand Total	3554.46	8309.00	-	-	-	174055457.00	220093910.00	46038452.77
Average	-	-	8.01	9.97	30344.13	-	-	-

enhancement, a total of Rs 4.60 crore have been earned as net profit by farmers in comparison of their local practice.

During implementation of CFLDs at farmer's fields, KVK scientists mobilized farmers to kept 25 to

35% of CFLDs produce as seed. Due to efforts of KVK scientists, farmers agreed and they kept 13285.54 q CFLDs produce as seed for next season.



S. No.	Сгор	Area Implemented (in ha.)	Average yield (q/ha)	Total production (in q)	Produce kept as seed (in q.)	%	Area covered/ to be covered (in ha.)
Rajasthan state							
1	Chickpea	1780.00	18.45	32841.00	9523.89	29.00	11904.86
2	Green gram	475.00	7.61	3614.75	975.98	27.00	6506.55
3	Black gram	260.00	4.37	1136.20	295.41	26.00	1477.06
4	Moth bean	177.16	5.03	891.12	169.31	19.00	1128.74
Harya	na state						
1	Chickpea	268.70	17.81	4785.55	1387.80	29.00	1734.76
2	Green gram (Summer)	593.60	6.55	3888.08	933.13	24.00	5184.10
Grand Total		3554.46	12.18	-	-	25.67	-
Averag	ge	-	-	47156.69	13285.54		27936.08

Table 3.9 Increasing SRR & horizontal expansion of pulses in Rajasthan & Haryana during 2018-19

3.17 Creation of seed hubs for increasing indigenous production of pulses

Objectives

- Raise awareness about the vital role of pulses in sustainable food production and healthy diets and their contribution to food security and nutrition;
- Promote the value and utilization of pulses throughout the food system, their benefits for soil fertility and climate change and for combating malnutrition;
- Encourage connections throughout the food chain to further global production of pulses, foster enhanced

research, better utilize crop rotations and address the challenges in the trade of pulses.

Seed hub project is being implemented in 10 KVKs including eight from Rajasthan and two from Haryana under ICAR-ATARI, Jodhpur. In the Rajasthan Seed hubs are established at KVK Jhunjhunu, KVK-Kota, KVK-Udaipur in first phase and in second phase seed hubs are established at KVK-Ajmer, KVK-Alwar-I, KVK-Jhalawar, KVK-Bundi and KVK-Nagaur-I. In the Haryana seed hub is established at KVK-Bhiwani in first phase and in second phase seed hub is established at KVK-Sirsa. KVKs have been given the targets of achieving 10000.00 q seeds in a year. In Rajasthan seed



Seed processing - KVK, Bundi



Seed Processing at KVK, Jhalawar





Seed Hub facility at KVK, Jhalawar

production program of Chickpea during Rabi 2018-19 & Urd bean and Mungbean during Kharif 2019 have been undertaken. In Haryana, seed production program of Chick pea during Rabi 2018-19 & Mungbean during Kharif 2019 have been undertaken. KVKs are producing seeds at KVKs farm as well as farmers' field with farmer's participatory mode to increase the quality seed availability farmers preferred varieties and to increase seed replacement rate. During Kharif 2019 KVKs produced 660.54 q. quality seed of farmers preferred varieties. During the Kharif 2019 seed production programme was affected by the heavy rainfall in the Kota region of Rajasthan state.



Participatory Seed Production programme in Ajmer district



Participatory Seed Production Programme - Alwar-I

Name of KVK	Сгор	Variety	Seed pro	oduction (q)	Category of
			Target (in q.)	Production (in q.)	seed
Jhunjhunu	Chickpea	GNG-2144, GNG-1958	600.00	338.86	F/S, C/S
Kota	Chickpea	GNG-1958	600.00	773.50	F/S, C/S
Udaipur	Chickpea	GNG 1958, CSJ 515	600.00	250.00	F/S
Ajmer	Chickpea	RSG-974, GNG-1958	400.00	448.00	F/S, C/S
Alwar-I	Chickpea	CSJ-515	400.00	700.00	C/S
Bundi	Chickpea	GNG 1958	700.00	695.60	F/S
	Lentil	KM-1	100.00	34.50	F/S
Nagaur-I	Chickpea	GNG-1958	650.00	30.00	F/S
Jhalawar	Chickpea	GNG-1958	500.00	500.00	F/S, C/S
Sirsa	Chickpea	CSJ 515, GNG-1958	200.00	350.00	C/S
		Total	5150.00	4480.58	

Table 3.10 Seed produced by various seed hub centres during Rabi-2018-19



S.No.	KVK	Crops	Variety	Production (in q.)	Category of seed	Remarks
1	Alwar-I	Green gram	IPM 2-14	305.00	FS	-
2	Ajmer	Green gram	MH-421	99.00	FS,CS	-
3	Jhunjhunu	Green gram	MH-421	31.60	CS	-
4	Kota	Black gram	PU-1, MU-2	0.00	CS, FS	100% Crop failure due to heavy rainfall during Kharif season.
5	Bundi	Black gram	MU-2	5.20	FS	Poor yield due to excessive rainfall.
6	Nagaur-I	Green gram	GAM-5, MH-421	129.05	FS, CS	-
		Moth bean	RMO-435	0.69	CS	-
7	Sirsa	Green gram	MH-421	90.00	CS	-
			Grand Total	660.54		

Table 3.11 Details of Seed Produced during Kharif 2019

3.18 Attracting and Retaining Youth in Agriculture under ICAR-ATARI, Jodhpur

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 and marketing, and
- To demonstrate functional linkage with different institutions & stakeholders for convergence of



ARYA activities - Gurugram

opportunities available under various schemes/ program for sustainable development of youth.

Under ICAR-ATARI, Zone-II, Jodhpur, ARYA project is being implemented by 9 KVKs of Rajasthan and Haryana. In each district,200 rural youth have been identified for skill development through entrepreneurial activities and establishment of related micro-enterprise units.

KVKs of Rajasthan and Haryana state have been organized 30 training programmes in allotted enterprises for rural youth. In 30 trainings, total 828 rural youths have been trained in different enterprises. Out of 828 trained youths 217 youths have been established their own unit/enterprise.



ARYA activities - Banswara

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S.No.	Name of KVK	State	Trainin	ıgs	Unit established	
			Number	Trainees		
1.	Banswara	Rajasthan	1	20	20	
2.	Jaipur-I	Rajasthan	3	75	15	
3.	Alwar-I	Rajasthan	4	87	02	
4.	Udaipur-I	Rajasthan	5	70	39	
5.	Bundi	Rajasthan	4	133	16	
6.	Jhalawar	Rajasthan	4	85	04	
7.	Gurugram	Haryana	1	16	08	
8.	Ambala	Haryana	4	142	67	
9.	Mahendergarh	Haryana	4	200	46	
		Total	30	828	217	

Table 3.12 Training organized & units established by KVKs during 2019-2020

Table 3.13 Enterprise wise youths trained by ARYA implementing KVKs during 2019-2020

		Number of rural youths trained									
Name of KVK	State (s)	Nursery management	Poultry	Goatery	Value addition	Protected cultivation	Mushroom production	Vermi- compost	Bee- keeping	Piggery	Total
Banswara	Rajasthan	-	-	20	-	-	-	-	-	-	20
Jaipur-I	Rajasthan	20	-	27	28	-	-	-	-	-	75
Alwar-I	Rajasthan	20	25	20	22	-	-	-	-	-	87
Udaipur-I	Rajasthan	20	25	15	-	-	-	10	-	-	70
Bundi	Rajasthan	-	58	55	20	-	-	-	-	-	133
Jhalawar	Rajasthan	25	-	-	-	17	-	24	19	-	85
Gurugram	Haryana	-	-	-	-	-	16	-	-	-	16
Ambala	Haryana	-	50	-	-	-	26	31	-	35	142
Mahendergarh	Haryana	-	-	-	100	-	-	50	50	-	200
	Total	85	158	137	170	17	42	115	69	35	828



ARYA activites - Jaipur-I



3.19 Value Addition and Technology Incubation Centre in Agriculture (VATICA)

The concept of Value Addition and Technology Incubation Centre in Agriculture has been developed in the EFC 2017-20 and accordingly after approval of cabinet, KVKs are actively involved in preparation of proposals to execute in their existing resources & situations. Division of Agricultural Extension, ICAR, New Delhi has given approval to three KVKs Viz, Kota, Jodhpur and Gurugram for execution of programme on small scale. KVKs are actively engaged in strengthening of activities under VATICA programme in the following area.

- Promotion of appropriate technologies to reduce Post-harvest losses.
- Promotion of proven Farm based technologies for assuring quality of produce to match with market standard.
- Promotion for potential crops, vegetables, spices etc. as per agro-climatic situations & markets.
- To incubate budding Agri-preneurship and Farmer Producer Organization on PHM technology based business.

3.20 Nutri -Sensitive Agricultural Resources & Innovation

This important programme has also been initiated during 2017 after cabinet approval by Division of Agricultural Extension, ICAR, New Delhi. All the Krishi Vigyan Kendras are actively involved in execution of this initiative under different environments. The major objectives of this initiative to promote different biofortified varieties of Cereals, Pulses, Oilseeds, Vegetables etc. for enchantment of nutrition especially rural women. Promotion of Nutri-Garden on largescale to improve nutritional status of farm women. To create awareness about different Nutir-Sensitive Products. This programme is women centered and Home Scientists of KVKs are supposed to play key role to minimize gaps of nutrition among farm women. Almost all KVKs of Rajasthan, Haryana & Delhi are actively involved in execution of NARI initiative through popularization of different varieties which are rich in iron, zinc, protein, vitamins, carbohydrates etc. Major emphasis is given on establishment of Nutri-garden in selected villages to provide different types of vegetables in the daily diet.



NARI Project activity in Churu district

3.21 Doubling Farmers Income

The Hon'ble Prime Minister's call Doubling Farmers Income (DFI) by 2022 conveys the strong message that "Farming must be treated as an enterprise, and the future agricultural development will have the returns and not just the outputs from the farmers as etc. prime objective". Thus it is agriculture plus plus plan with comprehensive strategic geo-political significance, especially for minimizing the widening inequalities and huge income gap between farmers and non-farmers. The marketing can also be enhanced by legalizing tenancy and land rights, therefore, reforms in the area should be stepped up and larger responsibility for this and other market reformers rests with the state government. Five Pillars for sustaining a steady income growth in long run are under Doubling Farmer Income.

- 1. Increasing productivity as a route to higher production, enhancing TFP level and growth.
- 2. Reduced cost of production, cultivation, increasing input use efficiency.
- 3. Optimal monetization of produce, optional price realization.







Doubling Farmers Income activity of Tonk district

- 4. Sustainable Production Technology and from discovery to delivering.
- 5. Risk negotiations all along the agricultural value chain, resilience and risk insulation of small holder farmers.

The task of "Doubling Farmer Income" has also initiated during 2018 and accordingly all KVKs have identified two villages and survey of two villages on different aspects were done by KVK's Scientists and based on existing situations, available resources and needs of farmers. All farm families have been included under DFI villages. All KVK's of Rajasthan, Haryana & Delhi are actively involved in implementation of different programmes & activities in holistic approach and convergence mode. Farmers are actively participating in this Government of India initiative "Doubling Famer Income".



Annual Report 2019



HUMAN RESOURCE DEVELOPMENT

Human Resource Development (HRD) is extremely important because organizations recognize that any value added to an employee is value added to the organization. Employees are eager for the opportunities to develop their skills and add value to their institutes. It is as an essential part of development and focuses on a series of actions directed at helping participants in the development process to increase their knowledge, skills, understandings and develop attitudes needed to bring about desired developmental change₹. 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 the effective coordination, implementation, monitoring and evaluation of trainings at ICAR institutes including ICARATARI, Jodhpur, has assessed training needs of employees involving in skill development of employees.

During 2019, total 8 training for Scientific, Technical, Administrative & Financial staff were planned (Table-4.1). Out of total trainings planned, 1 training programme was achieved.

During 2019, total 1 training Administrative & Financial staff were planned (Table-4.2).

S.No.	Category	Total No. of Employees	No. of trainings planned for 2019 as per ATP	Total No. of employees undergone training during the year 2019
1	Scientific	5	4	1
2	Technical	2	2	0
3	Administrative & Finance	5	5	0
	Total	12	11	1

Table 4.1 Physical and Financial Target and Achievements during 2019

Table 4.2 Training attended by Scientific staff during 2019

S.No.	Name of employee	Designation	Discipline/Section	Training attended
1	Dr. B L. Jangid	PS (AE)	Scientific	NEMA training at IARI, New Delhi held during 14-19 October, 2019.



ICAR - ATARI-II, Jodhpur



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 available limited resources, existing farming situation and need of the farmers. Directorate of Extension Education (DEE) is a nodal agency of State Agricultural Universities (SAUs) for promoting agricultural development by strengthening forward and backward linkage in the concerned region/state. Transfer of agricultural technologies is done through providing training, advisory services and supply of farm information to both extension professionals, personnel and farmers. DEEs are also involved in assessment, and transfer of agricultural technologies through on-farm testing and front line demonstrations. Being a Central part of SAUs, DEEs plan, monitor, implement and evaluate extension programmes of KVKs based on the needs and resource and existing situations. DEEs also engage for supporting to State Departments through training, workshop, meeting and publishing literature on different enterprises of agriculture and allied subjects. Directorate of Extension Education has multidisciplinary 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 socio-economic status of the rural people.

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 personnel 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 develop partnership with research system for technological backstopping to KVKs staff especially scientific and technical under are of jurisdiction including NGO's KVKs., and
- To provide farm advisory/information services including literature for fosterning dissemination process of agricultural technologies.
- To develop close linkages with different ICAR Institutes, development departments, NGOs, local traders, SHGs, FPOs, FIGs, etc.

Seven DEEs are functioning in Rajasthan and Haryana states. Out of these, 6 DEEs functioning in Rajasthan and one DEE are delivering extension services in Haryana state. The state wise distribution of DEEs is given in Table 5.1.

5.1 Human Resource Development

Human resource development of KVKs' staff is an important activity for enhancing knowledge and upgrading skills of Subject Matter Specialists and Senior Scientist & Heads. During 2019, DEEs organized 22 training programmes under capacity development programmes in which 4521 participants took part.

5.2 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–II and participation of KVKs are given in the table 5.3.



S.	Director's name	SAUs	Technological backstopping for KVKs (no			s (no.)	
No.			SAU/CAU	ICAR	NGO	DU	Others
1	Dr. S.K. Sharma	SKRAU, Bikaner (Rajasthan)	7	0	1	0	1
2	Prof. S.L. Mundra	MPUA&T, Udaipur Rajasthan)	8	0	1	0	0
3	Dr. Iswar Singh	Agricultural University, Jodhpur	6	2	1	0	0
4	Dr. K.M. Gautam	Agricultural University, Kota	6	0	0	0	0
5	Dr. B.L. Kakraliya	SKNAU, Jobner	7	1	1	0	1
6	Dr. R.K. Duria	RAJUVAS, Bikaner	1	0	1	0	0
7	Dr. R.S. Huda	CCSHAU, Hisar	14	2	2	0	1
			49	5	7	0	3

Table 5.1 Directorate of Extension Education & Technology Backstopping to KVKs

Table 5.2 HRD activities organized by DEEs in Zone-II

DEEs	Training areas	Trainings (no.)	Participants (no.)	KVKs (no.)
DEE, SKRAU, Bikaner	Need identification techniques	1	12	9
	Impact assessment	1	11	9
	How to make presentation	1	13	9
	How results of OFT & FLD should be presented.	1	13	9
	Total(a)	5	61	43
DEE, MPUAT, Udaipur	Nil	0	0	0
	Total (b)	0	0	0
DEE, AU, Jodhpur	Vegetable Science Congress, AU, Jodhpur 1-3 Feb,2019	1	4	14
	Water Management in High Value Crops: An Option for efficient use of water for Doubling Farmers Income in Arid Region, AU, Jodhpur 22-29 Nov., 2019	1	2	8
	Advances in Production and Post-Harvest management of Seed Spices and Arid Fruits (Back stopping Training for KVK Scientist of Rajasthan)	1	24	9
	Total (c)	3	30	31
DEE, SKNAU, Jobner	Workshop on Participatory Training Management Skills	1	28	7
	Total (d)	1	28	7
DEE, AU, Kota	Training under technical backstopping on "Modern Horticulture Techniques on 17-18 January 2019	1	25	6
	Soft Skills for Personality Development 25-26 Feb, 2019	1	40	4
	Work shop on Soft Skills for Personality Development at DEE AU Kota (Jointly by EEI and DEE) (15-16 October, 2019)	1	50	4



DEEs	Training areas	Trainings (no.)	Participants (no.)	KVKs (no.)
	National Seminar on "Strategic Management of Production and Post Harvest Technologies of Garlic, Onion & Potato (GOP)for Doubling Farmer Income in Changing Climatic Scenario" 27-28 January, 2019	1	677	6
	21 days orientation Course on "Agriculture Education, Research and Extension Management at Agriculture University Kota 27 th August, 2019 to 16 th September, 2019 and 3 rd December, 2019 to 23 rd December, 2019	2		6
Z	Total (e)	6	792	26
RAJUVAS, Bikaner	Orientation training programme for faulty	3	100	1
	Total (f)	3	100	1
CCSHAU, Hisar	Training on "Integrated Farming System: Opportunities and Challenges" from July 08-12, 2019 at CCSHAU, Hisar	1	45	5
	Agricultural Officers' Workshop (Rabi-2019) held from December 22-23, 2019 at CCSHAU, Hisar	1	245	14
	Kisan Diwas-Farmers'-Scientists Interface held on December 22, 2019	1	3000	14
	Agricultural Officers' Workshop (Rabi-2019) held on May 01, 2020 through Video Conference	1	220	14
	Total (g)	4	3510	47
	Grand Total	22	4521	155

Table 5.3: Workshops/meetings organized by DEEs

S. No.	Workshop/meeting conducted	No. of KVKs participated
SKRAU	, Bikaner, Rajasthan	
1	Review meeting of KVKs	9
MPUAT	Γ, Udaipur, Rajasthan	
1	Annual Zonal Review Workshop of KVKs Zone-II 2018-19 for Rajasthan, Haryana and Delhi states was organized from 22-24 th June, 2019 to review Annual Progress 2018-19. (Deputy Director General (Extension) Dr. A. K. Singh, Director, ATARI, Jodhpur Dr. S. K. Singh, 6 Director of Extension Education from Agriculture Universities of Rajasthan and CCS Haryana, Hissar participated).	63
2	Review workshop cum monthly meeting to monitor activities and progress of KVKs of MPUAT was held at KVK, Chittorgarh on 19 th August, 2019.	8
3	Scientific Advisory Committee meetings of KVK, Udaipur-II, Chittorgarh, Banswara was held on 19, 25, 27 September, 2019. While at KVK Rajsamand, Pratapgarh, Dungarpur, Bhilwara-I and II these were held on 4, 7, 16, 18, 19 October, 2019, respectively (Director, ATARI, Jodhpur Dr. S. K. Singh, Officer of line department of Agri., NGOs, NABARD, Farmers and farm women participated).	1
4	Brain Storming Session for Reviewing and Enhancing KVK performance was organized on 11 th November, 2019. (Hon'ble Vice-Chancellor, MPUAT, Udaipur Dr. Narendra Singh Rathore, all Deans and Directors of MPUAT, HODs of various discipline participated).	8



S. No.	Workshop/meeting conducted	No. of KVKs participated
5	20 th Extension Education Council Meeting of MPUAT was held on 19 th November, 2019 (Hon'ble Vice- Chancellor, MPUAT, Udaipur, Dr. Narendra Singh Rathore, Ex-Vice-Chancellor, Agriculture University, Kota Dr. Z. S. Solanki, Principal Scientist (AE) and Nodal Officer, Central Institute for Women in Agriculture, Bhuvneshwar (Odisha) Dr. Lipi Das, Deans and Directors of MPUAT, Joint Directors and Officers of line department of Agriculture, ZDRs, HODs, Progressive farmers & farm women participated)	9
6	Quinquennial Review Team visited MPUAT, Udaipur from 9-11 th December, 2019 (Dr. S. L. Mehta, Ex- DDG (Education), Dr. S. K. Rout, Ex-DEE, QUAT, Bhubneshwar, Dr. Prabhu Kumar, Ex-Director, ATARI, Bengaluru, Dr. M. M. Adhikari, Ex-DEE, BCKV, Nadia (W.B.), Dr. Arvind Kumar PS (AE), ATARI, Ludhiana. Dr. S. K. Singh, Director, ATARI, Jodhpur and Dr. B. L. Jangid, PS (AE), ATARI, Jodhpur attended the same).	16
AU, Jod	lhpur	
1	Zonal Workshop cum Training on Pulses, 7-8 Nov., 2019 At DEE AU Jodhpur (1) sponsored by ATARI, Jodhpur	53
2	Monthly Review Meeting (12)	07
SKNAU	J, Jobner	
1	Monthly review Meeting of KVKs organized on 09.01.2019 at KVK, Tabiji-Ajmer	10
2	Monthly review Meeting of KVKs organized on 08.02.2019 at Krishi Vigyan Kendra, Kotputli, Jaipur-II.	10
	Monthly review Meeting of KVKs organized on 08.03.2019 at DEE, SKNAU, Jobner.	07
	Monthly review meeting of KVKs was organized on 12.04.2019 at DEE, SKNAU, Jobner.	07
	Monthly review meeting of KVKs was organized on 13.05.2019 at DEE, SKNAU, Jobner.	10
	Monthly review meeting of KVKs was organized on 11.06.2019 at DEE, SKNAU, Jobner.	10
	Monthly review meeting of KVKs was organized on 07.08.2019 at Krishi Vigyan Kendra, Kumher-Bharatpur	08
	Monthly review meeting of KVKs was organized on 05.09.2019 at DEE, SKNAU, Jobner.	09
	Preparatory meeting was organized on 29.11.2019 for preparation of QRT visit at DEE, SKNAU, Jobner.	10
	Monthly review meeting of KVKs was organized on 20.12.2019 at DEE, SKNAU, Jobner.	10
AU, Ko	ta, Rajasthan	
1	KVKs monthly review meetings	6
	Extension Education Council Meeting	6
RAJUV	AS, Bikaner	
1	Monthly Review Meetings	1
CCSHA	U, Hisar	
1	Agricultural Officer Workshop (Rabi-2019) held on December 22-23, 2019	19
5	Agricultural Officer Workshop (Kharif-2020) held on May 01, 2020 through video Conference	19



5.3 Visits of Directorate of Extension Education Personnel to KVKs

During 2019, Directorate of Extension Education personnel made 288 official visits to KVKs for distinguished purposes (Fig. 5.1). The maximum visits (103) made for visits for monitoring followed by 58 visits for field days, 54 visits for SAC Meetings, 37 visits were for training programmes of KVKs, 25 visits were made for workshops and 11 visits were for technology week celebrations of KVKs.



Fig. 5.1 Visits of Directorate of Extension Education personnel to KVKs.

5.4 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, 24 technology inventories published by DEEs, while 27 technology inventories updated for benefit of farming community (Fig. 5.2).



Fig. 5.2 Technology inventory published & updated by DEEs.

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5.5 Technological Products Provided to KVKs

DEEs provided technological products to KVKs under their jurisdiction in Zone-II as given in fig. 5.3. Seed materials supplied **to** 45 KVKs, planting material to 32 KVKs, Bio-products to 18 KVKs, Livestock breed to 22 KVKs, Livestock product to 10 KVKs, Poultry breeds to 22 KVKs, poultry product to 10 KVKs and others (goat breeds and trichoderma) to 4 KVKs. The details about technological products provided to KVKs are given in fig. 5.3.



Fig. 5.3 Technology/planting material/breeds/products provided to KVKs.



Extension Education Council Meeting of AU, Kota



Annual Report 2019



AGRICULTURAL TECHNOLOGY INFORMATION CENTRE

Agricultural Technology Information Centre (ATIC) is a single window delivery system and which provides the services and information on recent technologies to the farmers for the jurisdiction area of State Agricultural Universities, ICAR Institutes. This "single window" also acts as a delivery system for the technological products available at institutes or State Agricultural University to the farmers and other interested groups as process of innovativeness in technology dissemination. 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 also provides mechanism for feedback from the users to the institutes/SAUs. Presently seven ATICs are working in the Rajasthan, Haryana and Delhi (Table 6.1). The details of activities undertaken by the ATICs during 2019 are listed in Tables 6.2 to 6.7, respectively.

6.1 Farmers' visit to ATICs

A total number of 62240 farmers had visited ATICs to get first hand technology information followed by 16376 farmers to purchase technology products developed by research institutes or agricultural universities and 1419 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 6.2.

6.2 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 screen Kiosk, cafeteria facilities are available in three ATICs. The details of operational facilities available ATICs of Zone-II are given in Table 6.3.

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.	IARI, New Delhi	IARI, New Delhi	Dr. N. V. Kumbhare
5.	NDRI, Karnal	NDRI, Karnal	Dr. Arun Kumar Misra
6.	CCSHAU, Hisar	CCSHAU, Hisar	Dr. Avtar Singh

Table 6.1 ATICs functioning in Rajasthan, Haryana & Delhi

Table 6.2 Farmers' visits to ATICs

S. No	Purpose of visit	Number of farmers' visited
1.	Technology Information	62240
2.	Technology Products	16376
3.	Others (Diagnosis of plant, soil and animals)	1419



	F		
S.No.	Particulars	Availability (Please √ mark)	Number of ATICs
1.	Reception counter	\checkmark	6
2.	Exhibition / technology museum		6
3.	Touch screen Kiosk	\checkmark	2
4.	Cafeteria	\checkmark	3
5.	Sales counter	\checkmark	6
6.	Farmer's feedback register		6

Table 6.3 Operational Facilities in ATICs

6.3 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 (40800), Video Shows (3890), letters received and replied (120), training to farmers / technocrats / students (158), others (662). The details of technology information provided by ATICs are given in Table 6.4.

6.4 Publications (Print & Electronic Media)

ATICs of Rajasthan, Haryana and Delhi 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 (6145) and technical bulletins (10450), The details of publications (print & electronic media) provided by ATICs are given in Table 6.5.

Information	No. of	No. of		Category of information					
category	ATICs	Farmers benefited	Varieties / hybrids	Pest management	Disease management	Agro- techniques	Soil and water conservation	Post harvest technology and Value addition	Animal husbandry and fisheries
Kisan Call Centre / other Phone calls from farmers	6	40800	14600	11500	7000	3840	2080	3860	2540
Video shows	4	3890	1200	805	620	585	240	180	260
Letters received	8	120	32	15	12	17	20	18	9
Letters replied	8	120	32	15	12	17	20	18	9
Training to farmers / technocrats / students	6	158	40	25	10	15	25	35	8
Others	4	662	0	0	0	662	0	0	0

Table 6.4 Technology information provided by ATICs in Zone- VI



Tuble 0.5 Fubleations (Finit & Electronic means) provided by Fiftes in Zone (Fi					
S.No.	Particulars	Number sold	Revenue generated (Rs.)	Farmers benefited	
1	Books	6145	31540	12560	
2	Technical bulletins	10450	27460	11285	

Table 6.5 Publications (Print & Electronic media) provided by ATICs in Zone- VI

6.5 Technology Products

ATICs provided technology products like seeds (5860.80 q) and planting materials 132800 nos.), poultry (6250 nos.) and bioproducts (30 q) to 40860, 17525, 108 and 2770 number of farmers, respectively. The details of technology products provided by ATICs are given in Table 6.6.

6.6 Technology services

ATICs provided technology services like soil and water testing, plant diagnostics, services to line departments and others (animal treatment and FLD) benefiting 380, 1240 and 8670 number of farmers, respectively. The details of technology services provided by ATICs are given in Table 6.7.

Table 6.6 Technology Products provided by ATICs

S.No.	Particulars	Quantity	Unit of quantity	Value (Rs.)	Number of farmers benefited
1.	Seeds	5860.80	Quintal	17265200	40860
2.	Planting materials	132800	Number	3451600	17525
3.	Poultry	6250	Number	511244	108
4.	Bio-products	30.00	Quintal	34500	2770

Table 6.7 Technology services provided by ATICs in Zone- VI

S.No.	Particulars	Number of farmers benefited
1.	Soil and water testing	380
2.	Plant diagnostics	1240
3.	Services to line departments	8670



Farmers at ATIC Crop Cafeteria

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ON FARM TESTING

Importance of location specificity in development of appropriate technology, keeping agroecological, 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- farmer's linkages. The multidisciplinary team of scientist 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. Trops 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 household's 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 Evaluation

Problem definition: Low productivity of Ridge gourd.

Technology Assessed: Assessment of efficacy of crop supporting Net.

Efficacy of crop support net was assessed by KVK Barmer-II using raised bed with crop supporting net. Furrows system (T1); use of raised bed with crop supporting net (T2). The results showed that raised bed with crop supporting net in ridge gourd had enhanced the

Technology Option	No. of trials	Length of fruit (cm)	Weight of fruit (gm)	Yield (t/ha)	Net Returns (Rs./ha)	BC Ratio
Furrows system (Farmers Practice)	05	25	105	78.5	91,550	2.40
Use raised bed with crop supporting net (Recommended Practice)		46.33	220	130.5	1,85,750	3.47

Table 7.1 Effect of crop supporting net on yield and income of ridge gourd



T1 farmers Practice



T2 Use raised with crop supporting net



T2



ridge gourd yield by 66.24% in Barmer along with net profit of Rs. 1,85,750/- per hectare. The yield under T2 recorded 130 t/ha with a profit of Rs 185750/- having B:C ratio of 3.47. In addition to it was also observed that use of raised bed with crop supporting net increased the weight and length of fruits in this trial which ultimately enhanced market price in local market.

Farmers Feedback: Majority of Farmers have fully convinced with efficacy of low cost intervention and farmers have committed to use this intervention in coming season.

Problem definition: Low yield of Isabgol

Technology Assessed: Management of weed in Isabgol.

An assessment trial was conducted by KVK Barmer II to manage heavy infestation of weed in Isabgol with treatment. T_1 - one time hand weeding at 20 DAS; T_2 -Oxydiagryll @ 50 g,m. a i/ha at 20 DAS with one hand weeding. Data analysis pointed out that Isabgol yield under T_2 was (9.36 q/ha) higher than T_1 (7.34 q/ha). Net profit earned was T_2 (Rs 35800 with B:C ratio 3.11) and T_1 (Rs 26280 with B:C ratio 2.73), respectively. The results indicated that the use of Oxydiagryll @ 50 g,m. a i/ha gave 27.52 per cent increase in yield over hand weeding. Results pointed out that farmers have been satisfied with application of weedicide in Isabgol in comparison to hand weeding.

Farmers Feedback: Farmers viewed that labour scarcity and more cost involvement in hand weeding has become difficult to manage weeds and management through application of herbicide has found economical and easy to manage weeds.

Table 7.2 Effect of Oxydiagryll on weed control and yield at Isabgol

Technology Option	No. of trials	Yield (qt./ha)	Increase in yield (%)	Net Return (Rs./ha)	B:C Ratio
One time hand weeding (Farmers Practice)	10	7.34		26280	2.73
Oxydiagryll @ 50 g,m. a i/ha at 20 DAS with 1 hand weeding.		9.36	27.52	35800	3.11



Problem definition: Low yield of Chickpea.

Technology Assessment: Management of wilt in chickpea.

T1- farmers practice, seed treatment with Carbendazim. T2-Seed treatment with carbendazim 50 % WP @ 2g/kg seed + Soil application of Trichoderma viride @ 2.5kg/hac.(Recommended Practice). T3 seed treatment with Trichoderma viridae @ 5gm./kg seed +



Incorporation of Trichoderma viridae @ 5 kg/ha multiplied on decomposed FYM @ 100kg/ha at the time of sowing. The wilt incidence was lower (5.30 %) and yield was higher (5.8q/ha) giving maximum net returns of Rs 58959/ha with more B:C ratio (2.93) as compared to T-2 (2.62 B:C ratio) and T-1 (2.44 B:C ratio).

Farmers Feedback: Farmers have accepted and assured that same will be applied in coming season.



ICAR - ATARI-II, Jodhpur



Problem definition: Low yield of paddy.

Technology Assessed: Management of plant hopper in paddy.

Plant hopper is a regular and serious pest of paddy. Due to the adoption of rice-wheat cropping system and application of high doses of nitrogenous fertilizers, the incidence of plant hoper in paddy is increasing in Kurukshetra district causing substantial yield losses in paddy. The results of OFT revealed that the application of Buprofenzin @825 ml/ha gave maximum yield 5100 Kg/ha and less hopper population of 4.0 in comparison to the application of Dichlorvos @ 625 ml/ha (yield = 4850 Kg/ha, hopper population = 6.0) and farmers practice (yield = 4600 Kg/ha, hopper population = 9.5).

Problem definition: Low yield of Rice.

Technology Assessed: Assessment efficacy of DSR in Rice.

Rice is a kharif crop grown in an area of 1.2 lakh hectare in district Kurukshetra. Due to the dependence on migrated labour, transplanting of paddy is becoming costlier, to reduce the cost as well as to maintain the optimum plant population and conserve natural resources, the efforts were made to compare the yield of paddy through different method of DSR. The trials conducted at farmer's field revealed that DSR in dry condition gave maximum yield 5010 Kg/ha and maximum net return of Rs.45290/- in comparison to DSR in Vattar condition (yield = 4800 Kg/ha, net return = Rs.40200/-). Directed Seed Rice has become popular on gradual basis as machinery is available to cover large scale incoming season to minimize preserver on land as well as water.

Problem definition: Low yield of Mustard.

Technology Assessed: Management of weed in Mustard.

KVK Alwar-I (Rajasthan) conducted on-farm trial on Orobanchae management in mustard. T1 - Farmers Practice -Hand weeding at 35-40 DAS.T2 -Spray of Glyphosate 41 S.L. @ 1 ml/6 lit water ha-1 at 25 DAS and 1 ml/3 lit water at 50 DAS. Glyphosate @ 25 g and 50 g a.i. /ha at 25 and 50 DAS spray had enhanced the Mustard yield by 16.42% in Alwar along with net profit of Rs.85050 per hectare. 40-45 percent Orobanchae weeds population was recorded Less.

Farmers Feedback: Farmers have told that other options may be explored to minimise intensity of Orobanchae weeds in light soils of Rajasthan.





Problem definition: Low yield of Tomato.

Technology Assessed: Management of Integrated Nutrient Management.

Productivity of tomato crop was assessed by KVK, Alwar-I using micronutrients and water soluble fertilizers. No use of micronutrients and water soluble fertilizer (T1), use of $ZnSo_45kg/ha$ and borax 2.5 kg/ha in



Problem definition: Low yield of Mustard.

Technology Assessed: Management of weed in Mustard.

An assessment trial was conducted by KVK, Churu-II to manage orobanche weed in mustard. Under T_1 farmers are using hand weeding at 25-30 days after sowing while T_2 was two spray of glyphosate @ 25 gm at 25 DAS and 50 gm at 50 DAS. Result revaluated that



Problem definition: Low yield of Cluster bean.

Technology Assessed: Integrated Pest Management in Cluster bean.

Management of sucking pests in cluster bean through botanical pesticide was assessed by KVK,

basal dose + spray of water soluble fertilizer 2.0 kg/ha (T2). The results showed that foliar spray of water soluble fertilizers was quite effective in increase yield by 21.15 percent through fruit weight, size of fruit and number of fruit as compare to control. (T2 - 378 q/ha) which resulted into a net profit of Rs. 585900/ ha with B:C ratio 1:6.16

The Yield under T1 was recorded 312 q/ ha with net profit of Rs 485788/ha having B:C ratio of 1:5.48.



20.98 % higher yield of mustard (15.97 q/ha) was obtained from T₂ (glyphosate @25 gm at 25 DAS and 50 gm at 50 DAS) as compared to farmer practice (T₁) which was 13.20 q/ha. Gross return, Net return and B:C ratio were also found higher in T₂ (Rs 55895, Rs 34795 & 2.65, respectively) as compared to farmer practice T₁ (Rs 46200, Rs 25200 & 2.20, respectively).



Churu-II using botanical pesticide spray T_1 Farmers practices (Dimethoate 30 EC), T_2 = Recommended of application 1st spray of Neem Oil 1% (Azadirachtin indica 1500 PPM) 2nd spray of Neem Seed Kernel Extract (NSKE) 5 per cent. It was found that farmer practices



yield 7.46 quintal per hectare and recommended 9.07 quintal per hectare. T_2 Net profit earned was the highest Rs 28,992/- and benefit ratio 2.3, T_1 Rs 23872/- and

benefit ratio of 1.9. Yield increased was 21.45 percent as compared to farmer practices.



Problem definition: Low yield of Chickpea.

Technology Assessed: Management of pod borer in Chickpea.

Management of pod borer in chickpea trial was conducted by KVK, Churu-II. T_1 = Farmers practices (Monocrotophos 36% SL), T_2 = Recommended of comprising application like first install pheromone traps at distance of 50 m @ 5 traps/ha, second spray of HaNPV 250 LE/ha and 3rd spray of Seed Kernel Extract (NSKE) 5 present. The all combination bio intensive effectively managed pod borer. It was found that farmer practices yield 9.51 quintal /ha and recommended 12.07 quintal /ha. T_1 Rs 26550 and benefit ratio of 2.26. T_2 Net profit earned was the highest Rs 38,350 and benefit ratio 2.74. Yield increased was 26.91 percent as compared to



farmers practice. This low cost and locally available technology has been accepted by majority of small categories of farmers. They have assured that this intervention will be used on largescale by farmers in coming season.

Problem definition: Low fertility status in saline soils.

Technology Assessed: Management of saline soils.

In Som Kamla Amba Command Area of Aspur block, Farmers Practice (Rice -wheat cropping system, more amount of water to crops in irrigation, using less FYM, no green manuring, no deep ploughing, sometimes excess use of chemical Fertilizers-N and P only), Farmers do not use solt tolerant variety of wheat which resulted very poor yield in saline soils. Performance of barley crop in salt affected soils was assessed by KVK Dungarpur using Deep ploughing (in summer) + Green Manuring (in rainy season) + FYM+ Salt tolerant crop (Barley, var. RD 2786). Seed rate @125kg/ha+15tone FYM/(10Tone FYM+GM)+75kg N+40 Kg P2O5+25kg Zinc sulphate. Result showed that use of green manuring+15ton FYM+ seed rate @125kg/ha+15tone FYM/(10Tone FYM+GM)+75kg N+40 Kg P2O5+25kg zinc sulphate improved soil fertility and barley grain yield up to 33.90 per cent (30.25q/ha) as compared to farmer's practices (22.59q/ha) earning net profit of Rs.28700 with B:C ratio of 1.90 during the year 2019.





OFT on Barley

Problem definition: Low yield of Brinjal.

Technology Assessed: Management of shoot & fruit borer in Brinjal.

Assessment trial was conducted by KVK, Dungarpur on management of shoot & fruit borer of brinjal. T1-Farmer Practice (Profenofos 40 EC @ 2ml/l); T2- Use of pheromone trap + spray of Azadirachtin @ 5ml/l + spray of emamectin benzoate 5% SG @ 0.4 gm/l at the infestation of insect that yield under assessment group (T2) was the 97.05% higher (171.10q/ha) as compared to T1 group (86.83q/ha) and earning net profit of Rs 128240 with B:C ratio of 3.55. Farmers have assured that they will apply for management of shoot and fruit borers in brinjal.



OFT on Brinjal

Problem definition: Low yield of Chilli.

Technology Assessed: Management of leaf curl in chilli.

KVK, Dungarpur also conducted an assessment trial on management of leaf curl of chilli using treatments as – T-1 Farmers' Practice (Dimethoate 30 EC @ 2ml/l); T-2 use of yellow sticky strip + spray of neem oil (1500ppm) @ 5ml/l at the initiation of infestation + acetamiprid 20 SP @ 0.3g/l at 15 days interval. It was observed that yield under assessment group (T2) was the 70.02% higher (68.35q/ha) as compared to T1 group (40.20q/ha) with net profit of Rs 207660 and B: C ratio of 4.15. Farmers have fully convinced with application of neem oil and most of farmers have started use of neem oil for management of leaf curl disease.





OFT on chilli

Problem definition: Low yield of Wheat.

Technology Assessed: Weed Management in Wheat.

KVK, Gurugram observed that yield of wheat was low due to infestation of narrow leaf and broad leaf weeds, therefore KVK laid out weed management interventions at farmer's fields of wheat using different molecules of herbicides. TO-1, farmer's practices farmers are using metsulfuron methyl 20%WP @8g/ha after 30-35DAS and TO-2 Intervention of application of carfentrazone 40DF+Sulfosulfuron 75%WP@45g/ha after 30-35 DAS. Metsulfuron managed only broad leaves weed but button weed (broadleaf weed) and narrow leaf weed phalaris minor was not managed by farmers practice and KVK applied TO-2 technology to manage all type of weeds. Result pointed out that farmers are satisfied using TO-2 technology instead of farmer practiceas it is beneficial B:C ratio of 4.39 and economic net gain Rs. 9891/ha due to increase yield by 8% and decrease weed population by 77% over farmer practice.

Problem definition: Low yield of Wheat.

Technology Assessed: Integrated Nutrient Management in Wheat.

Integrated Nutrient Management in Wheat under irrigated condition was assessed by KVK, Gurugram. The farmers are using fertilizers as 120:60:0kg NPK/ha and recommendation is 150:60:30:25kg, NPK and zinc sulphate/ha. In this intervention 10q FYM+biofertilizers as seed treatment (PSB &Azotobactor) + 75%NPK of recommended dose of fertilizers with zinc sulphate and soil test based was used. Result revealed that wheat wheat yield under intervention technology increased by 14.9% 60.9q/ha over farmers practice wheat yield under intervention technology increased by 14.9% 60.9q/ha over farmers practice 53.0q/ha. net return under intervention group earned was also maximum Rs. 116656/- with B:C ratio 3.93 over farmers practice Rs. 99520/- with B:C ratio 3.61. Also adoption of INM in wheat increased soil fertility status on gradual basis.

Problem definition: Low yield of bottle gourd.

Technology Assessed: Integrated Pest Management in bottle gourd.

KVK, Gurugram assessed low yield of Bottle gourd (Pusa Naveen) due to insect pests and disease infestation. The severity of cause is managed by following integrated pest management techniques ie T-1, farmers practice, there was no use of pesticide, T-2 seed treatment with Trichoderma harzianum @ 10gm/kg seed, installation of sticky traps @ 10 traps/acre and 2 spray of Neem oil @ 5ml/lit. water and 2 spray of Trichlorfon 50 EC @1 ml /lit of water alternatively, keeping in view of fruit harvesting and safe protection from the insect pest infestation. The tested technology provides better yield results and the average no. of insect pest per sq.m. area reduced from 6.80 to 2.40. The results revealed that under T-2, bottle gourd yield was higher 12.97% that gives additional net returns of Rs. 26832/ha over farmers practices. B.C. ratio was 3.73:1 for treatment as compared to farmers practice 3.47:1.





Problem definition: Low yield of Wheat.

Technology Assessed: Weed management in Wheat.

KVK, Nagaur-I in Rajasthan conducted on-farm trials on weed management in wheat crop by Metsulfuron Methyl @ 4 gm ai./ha at 30-35 DAS. The farmers got higher yield (53 q/ha) and net returns (Rs. 70350/ha) from demonstrated plots as compared to farmer practices (43.85 q/ha and Rs. 53329/ha, respectively).

Farmers Feedback: Farmers have accepted efficacy of herbicide and based on availability in the nearby market application will increase in coming season.

Weed Management in Wheat was assessed by KVK, Nagaur-I using two groups in trial. Farmer practice (T_1) ; Hand weeding at 30-35 DAS and Recommended Practice (T_2) ; Use of Metsulfuron methyl @ 4g a.i./ha at 30-35 DAS.

Table 7.3 Effect of Metsulfuron Methyl on yield and economics of wheat crop

Technology Option	No. of trials	Yield (q/ha)	Increase in yield (%)	Cost of Cultivation (Rs./ha)	Gross Return (Rs./ha)	Net Return (Rs./ha)	B:C Ratio
Hand weeding at 30-35 DAS (Farmers Practice)	10	43.85	-	34371	87700	53329	2.55
Metsulfuron Methyl @ 4 gm ai./ha at 30-35 DAS (Recommended Practice)		53.00	20.90	35650	106000	70350	2.97



Technology Assessed: Effect of blanching in Bajra.

Effect of blanching was assessed on shelf life of Bajra flour by KVK, Nagaur-I. Two types of treatments were taken. T1- Milling of Bajra without blanching; T2-





Milling of dried bajra grains after balching at 98° C for 30 seconds. The results of the study indicated that there was a significant increase in shelf life of Bajra flour after blanching. Shelf life of bajra flour increased by average 23days when compared to bajra flour without blanching.





Problem definition: Low yield of Barley.

Technology Assessed: Varietal Assessment in Barley.

KVK Nagaur-II conducted varietal assessment of Barley using local (T1) and RD-2786 (T2) varieties. The results of the trial indicated that new variety of barley RD-2786 obtained the maximum net returns (Rs 84950 yielding 51.75 q/ha with B:C ratio 3.70) and T1 (Rs 69345 yielding 43.1 q/ha with B:C ratio 3.22), respectively. Farmers were satisfied with the results of RD-2786 new barley variety and all farmers have kept seeds for coming rabi season multiplication.



Problem definition: Low yield of Isabgol.

Technology Assessed: Weed management in Isabgol.

Weed management in Isabgol was assessed by using herbicide with hand weeding. T1 -Farmers are using one hand weeding while application of Oxadiargyl 100 g/ha at 15 DAS + hand weeding at 30 DAS (T2). Results pointed out that farmers are satisfied using this herbicide in combination of hand weeding in isabgol instead of only one hand weeding, as it is beneficial (Yield 9.52 q/ha) and economic (Net returns Rs 53320/ha & B:C ratio of 4.13) due to effective weed management.





Resource conservation technology

Problem definition: Low yield of Chilli.

Technology Assessed: Management of weeds in Chilli.

KVK Maulasar observed low chilli yield due to high weed infestation, high labour requirement and more number of irrigation. Therefore, an assessment trial on effect of mulching on Chilli was conducted using three trials viz., T_1 - without mulch, T_2 - using straw mulch and T_3 - polythene mulch. Results showed that T_3 was found best with yield 262.81q/ha, net return 299224 Rs and B:C ratio of 4.15 which was followed by T_2 (yielding 241.86 q/ha, net return 270290 Rs and B:C ratio 3.92) whereas under control (T_1) yield recorded 221.71 q/ha with net return of Rs 246865 and B:C ratio of 3.88.



Problem definition: Low yield of groundnut.

Technology Assessed: Management of white grub in groundnut.

An assessment trial was conducted to manage white grub in groundnut. T1- Carbendazim 50WP and quialphos 25 EC, T2-: Pheromone (Methoxy benzene) technique of adult management for Holotrichia cansanguinea and Grub management through insecticidal seed treatment of Clothianidin 50 WDG 2 gm/kg seed+ soil drenching of imidacloprid 17.8 SL 300 ml/ha. Data analysis pointed out that groundnut yield was higher under T-2: (23.5q/ha) but higher than T1 (18.6q/ha). Net profit earned was the highest (Rs 63544 with B: ratio 2.18) under T2. T1 (Rs 44074 with B: C ratio 1.87), respectively. Majority of groundnut growers accepted this intervention as feasible, economically viable and socially acceptable.





Problem definition: Low yield of green gram.

Technology Assessed: Management of weeds in green gram.

KVK Sikar assessed Weed management in Green gram using manual hand weeding 25DAS (T_1); and Imezathapyr @ 600 ml/ha at 25 DAS (T_2). It was observed that grain yield under T_2 group increased by 7.71% over farmer practice (T_1) and was maximum (9.08q/ha) followed by farmer practice (8.43q/ha).



Problem definition: Low yield of Mustard.

Technology Assessed: Management of Sucking Pests in Mustard.

KVK,Udaipur 1, assessed infestation of sucking pests especially aphids. Using treatment as, T1- farmers practice (No seed treatment but foliar spray (not at ETL) with diemethoate) ; T2- Seed treatment with Imidacloprid WS 70 (8 ml per kg seed) then foliar spray with Azadirachtin (1st day of attack @3 ml per litre of water) then Imidacloprid 70 WG @ 2 gm per 15 litre of Further, the net profit earned from T_2 group was also the highest (Rs 32657 with 2.80 B:C ratio) followed by T_1 (26624 with 2.30 B:C ratio). Farmers have accepted usability of herbicide (Post emergence) as green gram is short duration and due to completion of weeds with green gram, crop suffers in respect to proper growth, flowering, pod formation & grains filling. Therefore, most of farmers will apply Imezathapar as post emergence herbicide in coming kharif season.



water at ET level and T3- Seed treatment with Imidacloprid WS 70 (8 ml per kg seed) then foliar spray with Imidacloprid 70 WG @ 2 gm per 15 liter of water at ET level. The results revealed that under T-3 Mustard yield was higher (17.63 q/ha with lower incidence of aphids (14%)) giving maximum net returns of Rs 74046/ha and with more B:C ratio (1.92) as compared to T-2 (14.86 q/ha with incidence of pest (48%) giving net returns of Rs 62412/ha and T-1 (09.15 q/ha with 69% higher incidence of aphids attack, giving net returns of Rs 38430/ha.





Problem definition: Low yield of Chickpea.

Technology Assessed: Bio-intensive pest management for pod borer in Chickpea.

An assessment trial was conducted by KVK, Udaipur-1 to assess the efficacy of IPM module in chickpea against gram pod borer attack. Under T-1 one or two spray of Qunalphos 25 EC @ 1.5 lit/ha as practiced by the farmers; while under T-2 Improved- IPM module was introduced i.e. 1 st - trap crop as marigold as onborder and after 25 rows of gram, spray NPV250 LE @ 1 ml/Litre at flowering stage at evening then spray of spinosad @0.5 ml/lit at ETL (Pheromone trap installed@7 / hac at 25 DAS). It was found that chickpea yield increased by 36.09% (16.78 q/ha) as compared to farmer's practice group (12.33q/ha), earning net profit of Rs 67120 with B:C ratio of 2.5.



Problem definition: Low yield of Groundnut.

Technology Assessed: Management of collar rot and termite in Groundnut.

An assessment trial was conducted by KVK, Udaipur-1 to manage collar rot and termite infestation in Groundnut. Under T-1 one or two spray of Dithane M-45 @ 2 ml/ lit as practiced by the farmers; while under T-2 Seed treatment with Trichoderma viride @ 8gm/kg seed, then at incidence of disease drenching with M-45 + Metalyxl 2gm/lit, and Chloropyriphos @4 lit/ha with irrigation water . It was found that Groundnut yield increased by 34.60% (8.83 q/ha giving maximum net returns of Rs 42384/ha and with more B:C ratio (1.72) as compared to to farmer's practice T-1(6.56 q/ha).







Problem definition: Low yield of Soybean.

Technology Assessed: Management of major lepidopterous pest in Soybean.

An assessment trial was conducted by KVK, Udaipur-1to assess the efficacy of insecticides in Soybean against lepidopterous pest mainly, semilooper, tobbbaco caterpillar and podborer. Under T-1 one or two



Technology Assessed: Nutrient Management in Cauliflower.

Cauliflower is an important crop cultivated in 2785.00 ha. area in Jaipur District. Besides this, crop in Bansa Area near by Chomu, where it is cultivated around in 700 ha in 15-20 villages. Cauliflower is cultivated from May and onwards to Feb. Month. In these areas of farmers observed a cause of yellowness in Curd which not only detonate the quality but also in yield upto 20-25% and farmers are getting less income from Cauliflower cultivation. The main reason of this cause observed is imbalance and improper use of micro-nutrients application.

spray of Triazophos 40 EC @ 1.5 lit/ha as practiced by the farmers; while under T-2 Spray with mixture of profenophos and cypermethrin (2ml/lit) at ETL. It was found that Soybean yield increased by 28.72% (13.98 q/ha, earning net profit of Rs 48930 with B:C ratio of 1.57) as compared to farmer's practice group (10.86 q/ha), earning net profit of Rs 38010.

Problem definition: Low yield of Cauliflower.



To overcome this problem, an assessment trial was conducted by KVK Chomu (Jaipur-1) to assess the effect of Arka Vegetable Special on yield and quality of Cauliflower. Farmers (T-1) applied simple NPK and FYM, no spray of micro-nutrients during standing crop and under Assessment Trial (T-2), Three Sprays of Arka Vegetable Special, 15 days after transplanting (IIHR, Hessargatta, Bangalore). The results of assessment recorded that good greenish lush growth during vegetative period and good white color and compact curd in T-2 Treatment and yield was increased 26.19% (i.e. 265 qt./ha) as compared to Farmers' Practice (T-1) (i.e. 210 qt./ha). Farmers earned net return of Rs. 2,10,000/per hectare with B:C Ratio 3.02.



Treatment T-1



Treatment T-2



Problem definition: Low yield of Tomato.

Technology Assessed: Nutrient Management in Tomato.

Tomato is an important vegetable of District Jaipur which is cultivated in 9859.00 ha. area. Flower dropping is major cause in tomato which resulted 10-15% yield losses. An assessment trial was conducted by KVK Chomu (Jaipur-1) to assess the efficacy of seedling treatment with Azospirrillum @ 30 ml/liter of water and spray of Pseudomonas @ 4.0 ml/liter of water to reduce flower-drop in tomato. Farmers (T-1) applied 160 kg. Urea 250 kg DAP and 40 kg Potash with 15-20 kg Zinc



Treatment T-1

Problem definition: Low yield of Groundnut.

Technology Assessed: Management of white grab in Groundnut.

Groundnut is an important oilseed crop of Jaipur District and cultivated in 31080.00 ha. area. Inspite of White-grub, leaf-spot is a major threat to groundnut cultivation that causes 10-15% yield losses. An assessment trial was conducted by KVK-Chomu(Jaipur-1) to assess the field efficacy of Tebuconazole 25.9 EC against Leaf-spot (Tikka) Disease. Farmer (T-1) applied one foliar application of Mancozeb 75 WP @ 1.0 gm/liter



Treatment T-1

Sulphate per hectare, while under Assessment (T-2) we recommended dose of fertilizer (as per STV) (N:P:K – 30:32:23) 65 kg Urea, 70 kg DAP, 38 kg Potash per hectare + tomato seedling treatment with 30 ml/liter of water azospirillum before transplantin and spray of pseudomonas @ 4.0 ml/liter of water 40 days after transplanting (I.I.V.R., Varanasi). The result of assessment recorded in T-2 that yield was increased 17.98% (328 q/ha) as compared to T-1 (278 q/ha). Farmers earned net return of Rs. 3,60,800/- with B:C Ratio 3.67.



Treatment T-2

and under assessment trials (T-2), Application of two foliar applications of Tebuconazole 25.9 EC (a) 1.5 mil/liter (Directorate of Groundnut Research, Junagarh) at 15 days intervals. The results of assessment recorded that minimum disease incidence (2.6%) was recorded in T-2 treatment as compared to T-1 (8.9%) and yield was increased by 13.67% (24.10 q/ha) as compared to Farmers' Practice (21.10 q/ha). Farmers earned net return Rs. 82,769/- with BC Ratio 2.01. Farmers were influenced with results of assessment technology and ready to follow the same in next season.



Treatment T-2





Problem definition: Low productivity of Ber (*Zizyphus mauriciana*) Cv.Umran.

Technology Assessed: Phosphorus application in ber (*Zizyphus mauriciana*)

Ber crop occupies second highest area after Guava in the district Faridabad. Main cultivar raised are Umran and Gola. Almost all the ber plants are 10-20 years old. The farmers were of the view that they are not getting the optimum yield i.e as they were getting 5-6 years earlier. After the discussion with farmers it was observed that the soil fertility is decreasing year after year and also they are not applying the recommended doses of fertilisers and even they are not using phosphorus fertilizer which is very important for increasing the yield of the ber crop. Keeping the importance of phosphorus application in ber for yield enhancement, the KVK, Faridabad conducted on-farm trial to assess the performance of yield of ber trees of Cv. Umran having the age of 12 years through application of recommended doses of Phosphorus fertilizer along with other nutrients (FYM-50 Kg, Urea-1.25 Kg per tree, SSP- 2.5 Kg - Recommendation by Deptt. of Hort., CCSHAU, Hisar). Results showed that the recommended dose of phosphorus along with other fertilizers gave 220 q/ ha yield whereas in case of farmers practice the yield was of 175 q/ha. There was an increase of 25.7 per cent in yield where full recommended dose of fertilizers was applied in the orchard. B:C ratio of check trial was 1: 3.89 whereas the B:C ratio of recommended technology was 1:4.4.

Livestock (Feeding Management): Assessment of area specific mineral mixture and deworming in goat

Low milk yield and low fertility in lactating goatdue to improper feed management was assessed by KVKAjmer. Treatments (T1)- Farmers practice- (No feeding of mineral mixture and No deworming); T2-Area specific mineral mixture @ 25 g/goat/day for 180 days + de-worming twice a year. The results showed that goat under farmer practice (T1) of no area specific mineral mixturefeedingand no deworming yielded 1.10 lit milk/day. Recommended practice (T2) of feeding of area specific mineral mixture25 g/goat/day for 180 days + deworming twice a year produced 1.30 lit./day with an increase of 18.18% over farmers' practice (T1).Cost Benefit ratio was found to be maximum in T2 group (1.59) as compared to T1 (1.26). Hence, feeding of 25 gram area specific mineral mixture per day /animal and de-worming twice a yearis recommended in the diet.

Source of technology: CIRG, Makhdoom (Mathura)

Treatment	Milk production (Kg./day/animal)	% increase	Avg. Birth rate	Total cost involved (Rs.)	Total income (Rs.)	Net income	BC ratio
Farmers practice- No feeding of mineral mixture and No deworming	1.10	-	1.00	6300	7950	1650	1.26
Areaspecificmineralmixture @25g/goat/dayfor 180 days + de- worming(recommended)	1.30	18.18	1.50	6485	10350	3865	1.59

Table 7.4

Sale rate of Fat @ Rs. 7.30 per %

Livestock (Feeding Management): Lower productivity of milk due to imbalanced feed and fodder managementin buffaloes

Low milk yield and low fat percentagein milk of buffaloes due to improper feed management was assessed by KVKAjmer. T1 – farmer practice -feeding of roughage (ad lib) and concentrate 2.5 kg/day; T-2Feeding of roughage (ad lib), concentrate 2.5 kg/day and azolla2.0 kg/day/buffalo. The results showed that buffaloes under farmer practice (T1) of feeding of roughage (ad lib) and concentrate 2.5 kg/dayyielded 7.40 lit milk/day. Recommended practice (T2) of feeding of roughage (ad lib), concentrate 2.5 kg/day and azolla 2.0 kg/day/buffalo produced 7.80 lit/day with an increase of



5.40% over farmers' practice (T1).Cost Benefit Ratio was also found to be maximum in T2 group (1.96) as compared to T1 (1.68). Hence, feeding of roughage (ad

lib), concentrate 2.5 kg/day and azolla2.0 kg/day/buffalo is recommended in the diet.

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Technology option	Avg. milk yield L/day/animal	Increase in yield (%)	Fat %	Total cost (Rs/month)	Gross return (Rs./month)	Net return (Rs./month)	BC ratio
Farmer practice-feeding of roughage (ad lib) and concentrate 2.5 kg/day	7.40	-	6.80	6525	11020	4495	1.68
Feeding of roughage (ad lib), concentrate 2.5 kg/day and azolla 2.0 kg/day/buffalo	7.80	5.40	7.00	6075	11957	5882	1.96

Sale rate of Fat @ Rs. 7.30 per %

Assessment of effect of curd as a natural probiotic on growth of Goat Kids

KVK, Barmer-I conducted On Farm Trial for 90 days to assess the effect of curd as a probiotic supplement on the performance of male kids. Thirty kids of three month age were assigned to two groups of 10 kids with control group(sole grazing) and 20 kids experimental

group (supplement of goat curd 15ml and 150g concentrate daily) and were allowed to suckle their dams freely with and ad lib grazing. The experimental group was fed curds orally at the rate of 15 ml/day while the control group did not receive any such supplement Body weight was increased by 26.74% over farmers' practice. There was no diarrhea found in both groups.

Table 7.6 Performance of goat Male kids

Treatment	Initial body Weight (Kg)	Final body Weight (Kg)	Average Daily gain (g)	Total Weight gain (Kg.)
Control	14.250	21.500	80.55	7.25
Experimental	14.250	27.250	144.44	13.00

Table 7.7

Treatment	Before Treatment Weight (Kg)	After Treatment Weight (kg)	Average cost of treatment (90 days) Rs	Average Return Rs	Net Return RS	BCR
T1	14.250	21.500	Nil	5418	5418	1:1
T2	14.250	27.250	270	6812	6542	1:1.20

Problem Identification: Poor feeding and low production of milk in cow.

Technology assessed: By pass protein and fat in cow.

KVK, Barmer-I assessed impact of Bypass protein and fat. Table reveals that experiment was conducted on 10 cows who at the stage of second and third lactation period after 1-2 month of calving, before treatment. It was found out that yield of milk was 4.81 litres of average milk and after feeding of Bypass protein and fat @ 200gm/head/day, milk yield was recorded 6.53 litres of average milk with the increased production of 1.52 litres milk. Hence, net return was 54.15(just double) and BCR found to be 1:1.32 over control.





Treatment	Before Treatment Production	After Treatment Production	Increase Production	Average Cost Rs/Day	Average Return Rs	Net Return	BCR
T1	4.81	4.81	0.00	130.75	168.00	27.75	1:1.28
T2	4.81	6.33	1.52	167.40	221.55	54.15	1:1.32

Table 7.8 Impact of Bypass protein and fat on milk yield in dairy cattle

*Selling of Milk Rs.35/lit

Feed Management in Cow

Feeding of imbalance concentrate mixture to milking cows is a general practice reflecting traditional thought of animal feed management. KVK, Churu-1 (Rajasthan), conducted a trial to assess the home prepared balance concentrate mixture(maize/pearl millet/barley - 30%, cotton seed cake- 20%, cotton seed - 10%, moong churi-17%, wheat bran-20%, mineral mixture-2% and salt-1%) for feeding to milch cow.



In the conventional practice, the farmers were feeding cotton/oilseed cakeonly than balance mixture. There was 1.9 l/day increase in milk and 0.68 point increase in fat % of milk was recorded with feeding of homemade concentrate mixture.

Goat husbandry is the backbone of rural farmers of Western Rajasthan. In Churu district existing goat population is about 80 lacs but productivity of flesh and milk/unit is very low. It depends on feeding and disease management practices followed by the farmers. Infestation of internal and external parasite is a major cause in the area and farmers are not using treatment for both the parasites. To address this problem KVK Churu-I (Raj) conducted a trail to assess the Ivermectin for management of both internal and external parasites in goat.



Recommended practice is the use of Fenbendazole 5 mg/kg body weight (for internal) and spray of cypermethrin 100EC@1.5 ml/l water(for external) in T2 and in T3 treatment Ivermectin S/C(sol. 1%)0.2 mg/kg body weight is given to infected animals for management of both parasites.

The results revealed that body weight of goat increased by 1.02kg/unit in T3 treatment after 90 days of treatment and milk production increased by 70 ml/day. As far external parasite is concern it was managed 100% in T3 followed by 60% in T2 respectively.




Disease Management in Buffaloes

Kotputli and Poata region of Jaipur district is located at Haryana border and majority of dairy farmers having Murrahbuffalos.The cost of buffalo management is so high and calf mortality(approx.40%) occurs due to multifactorial causes i.e. lack of deworming,not feeding of colcustrum to calf within 1-2 hours of birth, improper cutting of naval cord and no use of disinfectant.

Technology Option	No. of trials	Calf mortality %	ADG (gm)	Cost of rearing(Rs/ Calf)	Gross Return (Rs/Buffalo/ day)	Net Return (Rs/Buffalo /day	B:C
Imbalance & improper time of colustrum& milk feeding, No use de-wormer, No care of naval cord (Farmers practice) (T_1)	10	30	445.24	120	155.83	35.83	1.30
Cut naval cord& treatment with tincher Iodine+ Colustrum feeding with in 1 hr of calving @ 10% of calf body weight + de-worming with Albendazole at 7 & 21 DAC (T_2)		0	541.67	121	189.58	68.58	1.57

Table 7.9 Effect of Calf management Technology

ADG- Average Daily Gain (Body Weight)



Technology Assessed: Calf management at village Sangteda

Feed Management in Cattle

Animal requires certain minerals & Vitamins for their optimum growth, Maintenance, milk production & reproduction. The minerals & vitamins available in feed & fodder are very less. These take care of the maintenance & production to a certain extent but will not be sufficient to take care of all the requirements. At the same time through every liter of milk animal also loses certain quantities of minerals & vitamins, which need to be replaced as early as possible by giving mineral mixture; so it is very essential to give mineral mixture every day. Methochelated mineral mixture provides the required minerals in balanced proportion for better metabolic activity and to achieve optimum productivity in buffaloes. Every farmer should give Methochelated Mineral Mixture to the milk animals in order to manage animals daily need and milk yield may also be improved upto 10-15 %.

Source of Technology: NDRI, Karnal

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Technology Option	No. of trials	Milk Yield lit/day	% increase Milk yield	Cost of rearing (Rs/Buffalo/ day)	Gross Return (Rs/Buffalo/ day)	Net Return (Rs/Buffalo /day)	B:C
Farmers Practice (T_1) No use of Methochelated mineral mixture in feed	10	9.60	-	180	384	204	2.13
Assessed Rec. Practice $(T_2)_2$ Use of Methochelated mineral mixture in animal feed @ 40 gm per animal per day for three month		11.05	15.10	188	442	254	2.35

Table 7.10 Effect of Methochelated mineral mixture



Technology Assessed: Methochelated mineral mixture at village Bakhrana

Synchronization of oestrus in cow

Oestrous (heat) synchronization in cow involves manipulating the female's oestrus cycle so they can be bred at about the same time. Oestrous synchronization will not substitute for lack of nutrition, herd health or poor herd management; therefore, it is not effective in non-cycling females. KVK Jodhpur-1 selected 10 cows for the synchronization programme. The Synch program is comprised of an injection of GnRH on day 1, an injection of prosta-glandin on day 8 and then a second injection of GnRH with breeding on day 10. Cows were artificially inseminated after oestrus. Nine cows were pregnant. The cost of one animal is one thousand only. The advantages are tight synchronization of oestrus, most females respond to the treatment and it encourages oestrus in non-cycling cows that are at least 30 days postpartum. Appropriate nutritional management of the herd is essential for successful implementation of several synchronization programs in both cows and heifers. Manage mental procedures like timely insemination and calf removal have been reported to be beneficial for synchronization of oestrus and may also be applied in most of the synchronization programs for better results.





Delay Oestrus (Anoestrus) in Heifers

Anoestrus (delay oestrus) is a common problem in dairy animal in arid region. The optimum production from dairy animals is dependent upon efficient reproduction and is often measured by number of offspring per breeding animal per unit of time. The major reproductive disorders of economic importance in cattle are repeat breeding and anoestrus including silent oestrus. Anoestrus condition is generally observed after parturition when the animal suffers from negative energy balance. But in spite of all these efforts, anoestrus is a significant problem amongst dairy herds in arid region. On farm trial was conducted by KVK Jodhpur. Before taking in treatment group, all the animals were examined for their normal genitalia and those animals were excluded which were having the pathological condition. The weights of the animals were at least 200 kg. Farmers practice was observed (control) that they feed only rougphage to their animal. T_2 group (n=6) animals were feed concentrate @ 2 Kgs per day with 50 gms mineral mixture for one month and T_3 group (n=10, 5 buffalo heifers, 5 cow heifer) animals were feed T_2 treatment (package) with heat inducing capsule @ 6 per day for 2 days after feeding of concentrate completion. Along with treatment, the ovarian massage was done in all the animals to increase the blood supply to ovary. The OFT result was observed 30%, 50 % and 90 % successful oestrus symptoms in T_1 , T_2 and T_3 group of animals respectively.





Assessment of Prebiotic containing Refined functional Carbohydrates (RFCs) on Calve's overall health and immunity

Problem definition: Retarded growth and weak immuity of calves

Cause: Imbalanced Diet/Malnutrition in Calf

Technology Assessed: KVK, Ambala conducted Trial to assess effect of Prebiotic Containing RFCs on overall health & immunity of calves as far as weight gain, morbidity & mortility are concern as major parameters as dairy farmers faces lot of challenges in rearing calf since preweaned stage due to many got health issues.

Technology Option	No. of trials*	Average Body weight of calves (6 months age) (kg.)	Any prevalence of disease infestation (Morbidity & Mortality) No.	Reduced expenses related to heath and immunity challenges	Cost (Rs./unit/day)	Gross Retrun (Rs./unit/ day)	Net Returns (Rs./unit/ day)	BC Ratio
T ₁ –Milk replacer (F.P.)	10	142	Morbidity 5 Mortality -2	-	157	194	37	1.24
T ₂ – Milk replacer + supplementation of prebiotic containing RFCs(BMC Veterinary Research)- Rec.		154	Nil	40%	147	290	143	1.97

*No. of trials are no. of replications

No. of calves in each replication : 1

Assessment of Dietary cation-anion difference (DCAD) balancing diet to optimize Animal productivity

Problem definition: Low milk yield due to imbalanced DCAD diet

Cause: Imbalance of DCAD before and after parturitation/calving

Technology Assessed: KVK, Ambala conducted Trial to assess impact of DCAD balancing diet to optimize Animal productivity as during advance pregnancy cow undergoes several stress and so calving also remain difficult and after parturitation, production could not optimized under imbalanced DCAD conditions.

Table 7.12 Assessment of Dietary cation-anion difference (DCAD) balanced Diet to optimize Animal productivity

Technology Option	No. of trials*	Average Milk Yield (lit/Day/Ani)	Successful Parturitation /Calving	Incidence of Milk fever(%)	Cost (Rs./Unit/ day)	Gross Retrun (Rs./unit/ day)	Net Returns (Rs./unit/ day)	BC Ratio
T ₁ : Standard balanced diet without balancing DCAD (FP)	10	23	7	30	430	920	490	2.14
T ₂ : Standard balanced diet + DCAD (Dietary cation- anion difference) balancing suppliments at pre and post parturition stage (Assessment) –Journal of Animal Science and Biotechnology		29	9	Nil	410	1160	750	2.83

*No. of trials are no. of replications.

No. of animals in each replication : 1



Effect of supplementary feeding of Shatavari roots powder on milk production performance of lactating buffaloes was assessed by KVK Karauli. T1 – farmer practice (Wheat Straw + Mustard Cake); T-2- Satavari Root powder @50 g./ day /animal mixed with balanced concentrate mixture as per requirement

Source of Technology: NDRI Karnal

The results showed that buffaloes under farmer practice (T1) of wheat straw with mustard cake feeding yielded 7.60 lit milk/day, while in intervention, feeding of Satawari Root powder @50 g./ day/animal mixed with balanced concentrate mixture as per requirement yielded 8.90 lit milk/day recorded 14.47% increase in milk yield overfarmer's practice. Thus, it may be concluded that shatavari has lactogenic properties to improve the milk production and economic for feeding to dairy animals.



Supplementation of Satavari Root powder

• Assessment of effect of Bye pass fat on milk production performance of buffaloes. T1- Farmer practices Feeding of Wheat straw/Bajra Kadbi along



Bye Pass fat Mixture distribution and Off campus

with Mustard cake/Wheat Flour; T2-additional feeding of Mineral Mixture @60gm./day/ buffalo+Bypass protein and Fat which SAU recommended the product (Commercial Product) @ 100gm/day/buffalo with T1.

• The results showed that buffaloes under T2 group yielded maximum milk (10.80 lit) with B:C ratio 2.88 as compared to buffaloes under T1 group (8.71it having 2.68 B:C ratio. Also net profit was recorded from the buffaloes under T2 group (Rs. 282.00/animal) followed by T1 group (218.00/animal).



Supplementation of Bye Pass fat

Name of problem: Poor growth and production performance of goats

Feeding management in Goat

Background: Goat farming in tribal area of Rajsamand is an important component for employment generation and livelihood security for tribal farmers. Huge availability of goats in tribal area is a good resource for employment generation and there is no social taboo for its consumption of meat as well as milk. Goat milk is also good for child, pregnant women and old age people.

Source of technology: NDRI, Karnal

Feasible solution

- 1. Mineral mixture supplementation
- 2. Use of deworming and vaccination

Treatments

 T_1 = Farmer practices (Existing feeding management practices)



 T_2 = Farmer practices + deworming & Vaccination +10g mineral mixture /day/animal

Accessibility & Suitability:

Growth and production performance of goats very poor.

Performance/Results

To Assess the growth and production performance of goats.

Indicators for Accessibility: Growth and production performance of goats

S.No.	To reduce calf mortality rate in buffaloes	No. of trials	Growth rate	Milk production
1.	T ₁ = Farmer practices (Existing feeding management practices)	10	20-25 kg body weight/ goat	300-500ml /goat/day
3.	T ₂ = Farmer practices + deworming & Vaccination +10g mineral mixture /day/animal	10	15-20 per cent higher then control	20-30 % increase in milk yield then control group

Supplemental Feeding in Buffaloes

• Low milk yield of cattle due to improper feed management was assessed by KVK, Navgaon (Alwar-I). T1- Available feed ingredients with farmers. T2- Balanced contrite mixture @1.5 kg/day with azolla 2 kg/ day/ animal. It was observed that T2 group of buffalos produce milk yield 20.58 percent



Feeding Management in Buffaloes

• Long inter calving period in buffaloes assessed by KVK, Navgaon (Alwar-I) using mineral mixture and hormonal catalyst. T1 – Farmer practice (No mineral

mixture feeding), T2- 60 gm mineral mixture/ day and two times deworming in a year + two CU-Co tablets/ day for 10 days. The results of this study reveals that the use of minral mixture and hormal catalyst in recently calving buffalos shorten the calving interval from 18 month to 15 months.



Source of Technology: RAJUVAS, Bikaner

Feeding Management in Buffaloes

Low milk yield in lactating buffaloes assessed by KVK, Chandgothi, Churu using feed supplement. T1-available ingredients with farmer / prepared feed from the market; T2-Satavari root powder 50g /day /animal. It was observed that buffaloes under T2



group yielded the highest milk (8.49 lit having 7.8% fat) followed by buffaloes under T1 group (7.63 lit having 7.5% fat) respectively. Milk yield % increase due to supplementation of shatavri root powder was 11% higher than T1 and net profit of supplement feeding 50 gram Shatvari was 20.4 (280 Rs/kg Shatavari and 40 Rs /lit milk) than the T1. Hence, feeding of 50 gram Satavari root powder supplement per day per animal is recommended in the diet for sustain the milk production and better reproduction performance. Therefore it is evident from the results



Problem definition: Late conception of cows increases the service period and thus increase calving interval

Source of technology: CIRCT, Meerut

No of treatment with full details: Three treatment

- T1-Balance feed
- T2- Balance feed with chelated minerals and vitamin mixture and
- T-3 Balance feed with vitaminizedoxicare OVN mineral mixture



Before Treatment

that Shatavari root powder supplementation not only improved milk production but also sustained milk yield at higher levels for a longer period. Shatavari root powder contains some active components, which stimulate the hypothalamus or pituitary gland, leading to release of higher levels of prolactin hormone thereby increasing the milk production. While estrogenic effect of Shatavari on mammary glands, stimulates alveolar secretary epithelial cell division and proliferation.



KVK - RDDC Protocol of hormonal treatment was used in all animals

Performance indicator: Conception rate

Result: It was found that T3 have higher conception rate of 64.32% as compared to T2 (37.1) and T1 (33.87%).

Farmers Reaction: Conception of animals means animal became pregnant so farmers like this technology but for this we have to trained the veterinary personnel of that area in the field of uterus synchronization.



After Treatment



Problem definition: Minerals supplementation for better productive and reproductive efficiency in Cattle

Technology Assessed: Increment of milk production and reduction of anestrous problem in cattle by supplementing of mineral mixture in the feed

Justification: A bench mark survey was conducted in villages to find out the problems of cattle. It was concluded that cattle comes in oestrus (heat) at the age of 3.5 to 4.5 years which affect the productive life span and productivity of the heifers thereby adversely affecting the cattle owner's economy of the region. Ideal conception of cattle age is 2.5 to 3.0 years. The main reason of late oestrus was late maturing due to poor feeding and poor health. The late maturity could be reduced by balanced feeding and management practices. One of the better feeding management practices is to provide mineral supplement with vitamins and dewormer in her ration where this is lacking in their ration. The objective of the

present trial is to intervene and reduce the late maturity period of the cattle by using the appropriate feeding management practices.

Source of technology: NDRI, Karnal

No. of treatment:

T1=Farmers practices, no mineral mixture feeding.

T2=T1+50 gm mineral mixture feeding/day/cattle

T3=T1+T2 +60 gm mineral mixture + 50 gm common salt+Deworming by fenbandazole

Performance of indicator:

- 1. Yield (lit.)
- 2. % Increase in yield
- 3. Net Returns
- 4. Cost benefit Ratio
- 5. Farmers reflection

Crop/ enterprise	No. of trials	Technology refined	Parameters of assessment	Data on the parameter	Milk Production per cattle (lit/day)	Net Return (Profit) in Rs. / Cattle	BC Ratio
Mineral Mixture	10	Feeding 60 gm Mineral mixture and 50 gm Common salt /day/animal and deworming by fenbendazole	Daily milk yield (Liter per day) Service period (days)	7.05 lit (5.60 lit check) milk production /day/cattle 100 %(66.67 % check) cattle conceived and service period 78.5 days as compared to 126.52 days in check	T1=5.60 T2=6.50 T3=7.00	T1=100 T2=132.00 T3=151.50	T1=1.81 T2=2.03 T3=2.18

Result of OFT

Technical observation: In intervention point Farmers practices +50 gm mineral mixture feeding/day/cattle +60 gm mineral mixture +50 gm common salt +Deworming by fenbandazole the Milk Production is 7 lit. / cattle /day as compare to the farmers and recommended treatment

i.e. 5.6 lit. and 6.5lit /cattle /day milk production was observed respectively.

Farmers reflection: Farmers appreciated the performance of mineral mixture feeding and de-worming because milk increase and improve animal health.





FRONTLINE 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, FLDs provide 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.63 KVKs are actively involved in conductance of FLDs under close supervision & guidance of ICAR-ATARI, Jodhpur in Rajasthan, Haryana and Delhi. Other than FLDs, farmer's days, field days, trainings, workshops, seminars, farmersscientists interaction etc. 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 among farming community based on gap between improved technological packages and farmers' practices under different farming situations.

During 2019, a total 12890 FLDs were conducted on crops (8538), kitchen gardening (2384), dairy (397), farm implements (1369), and others allied sectors (321). These FLDs were undertaken on 3768.41 ha area including 3256 units, respectively (Table 8.1). The FLDs undertaken by KVKs of ICAR-ATARI, Jodhpur categorized into various sub-heads which are given below.

FLDs	1	Rajasthan		Har	yana & Delh	i	Zone Total		
	Farmers	Area (ha)	Units	Farmers	Area (ha)	Units	Farmers	Area (ha)	Units
CFLDs on Oilseeds under NFSM	1284	517.3		152	70		1436	587.3	
Other oilseed crops	895	381.6		0	0		895	381.6	
CFLDs on Pulse under NFSM	2414	962.16		203	115		2617	1077.16	
Other pulse crops	572	268.5		61	35		633	303.5	
Cereal crops	341	136		374	151.2		715	287.2	
Commercial crops	46	19		205	76		251	95	
Fodder crops	225	35.5		36	5.6		261	41.1	
Horticultural crops									
Fruits	50	13		30	12		80	25	
Vegetables	841	131.8		101	26.5		942	158.3	
Medicinal Crops	85	34		0	0		85	34	

Table 8.1 Achievements of FLDs Conducted during 2019 by KVKs of ICAR-ATARI, Jodhpur



FLDs]	Rajasthan		Har	yana & Delh	ıi	Zone Total		
	Farmers	Area (ha)	Units	Farmers	Area (ha)	Units	Farmers	Area (ha)	Units
Millet Crops	252	127		50	20		302	147	
Spice Crops	0	0		0	0		0	0	
Others	281	115.25		40	16		321	131.25	
Total (a)	7286	2741.11	0	1252	527.3	0	8538	3268.41	
Dairy	387		387	10		10	397	0	397
Goat & Sheep	50		50				50	0	50
Poultry	120		1365	32		160	152	0	1525
Farm implements	359	24		1010	476		1369	500	0
Kitchen gardening	1284	0	1284	1100	0		2384	0	1284
Total (b)	2200	24	3086	2152	476	170	4352	500	3256
Grand Total (a&b)	9486	2765.11	3086	3404	1003.3	170	12890	3768.41	3256

Cluster Front Line Demonstrations on Pulses under National Food Security Mission:

A collaborative project ICAR-DAC&FW entitled "Cluster Frontline Demonstrations on Pulses Production Technology" is being executed with the active involvement of Division of Agricultural Extension, ICAR, New Delhi through a network of 578 KVKs across the country since October 2015 under National Food Security Mission. Total 61 KVKs including 43 KVKs from Rajasthan, 18 KVKs from Haryana and One KVK from Delhi state have been actively involved in conductance of CFLDs in Kharif, Rabi and Spring/Summer seasons during 2019-20 with below-mentioned objectives:

- Increasing production of pulses through area expansion and productivity enhancement in a sustainable manner in the identified districts
- Restoring soil fertility and productivity at the individual farm level, and
- Enhancing farm level economy (i.e. farm profits) to restore confidence amongst farmers with increasing Seed Replacement Rate (SRR) under pulses crop.

During 2019, CFLDs were organized during Kharif season in participatory mode under various farming environments. An area of 1077.16 ha was covered with active involvement of 2617 farmers under Pulses demonstrations.

S. No.	Crops	State	Achievement of CF	LD Pulses during 2019
			Area (in ha)	No. of Demonstration
Kharif Seas	on			
i.	Moth bean	Rajasthan	197.16	506
ii.	C	Rajasthan	475.00	1136
	Green gram	Haryana	80.00	142
iii.	Black gram	Rajasthan	260.00	688
:	Discon noo	Rajasthan	30.00	84
IV.	Pigeon pea	Haryana	35.00	61
		Total Kharif Season	1077.16	2617

Table 8.2 Targets and achievement of CFLDs on Pulses under NFSM during 2019



Performance of Cluster Demonstrations of Moth bean during Kharif Season (2019):

Moth bean is an important pulse crop of arid and semi-arid regions of India. Moth bean is a hot weather, drought resistant legume. The crop is generally grown in north western deserts regions of India especially in area where moong bean suffers from drought. In India, crop is extensively grown in Rajasthan. Moth bean demonstrations were laid out in 197.16 ha area at 506 farmers' field in 13 districts of Rajasthan state. The average yield under demonstration was 5.24q/ha with net return of Rs. 14183.30/ha compared to local variety (4.08/ha). An average yield advantage of 27.25% was observed under CFLDs on moth bean.

KVK	Variety Demonstrated	Area (ha)	CFLDs	Average (q/ł	e Yield na)	% increase	Net Return (Rs./ha)		BCR	
				Farmers Practice	CFLDs		Farmers Practice	CFLDs	Farmers Practice	CFLDs
Bikaner-I	RMO-40	10.00	25.00	5.13	6.66	29.82	17,280.00	26,460.00	2.28	2.96
Bikaner- II	RMO-257	10.00	25.00	4.80	6.20	29.17	11,560.00	17,790.00	2.05	2.36
Jaisalmer-I	RMO-435	10.00	25.00	3.92	4.60	17.35	7,824.00	9,270.00	1.69	1.90
Jaisalmer-II	RMO-257	10.00	25.00	3.76	4.36	15.96	7,142.00	9,507.00	1.68	1.87
Churu-II	RMO-257	10.00	25.00	4.27	5.77	35.13	7,598.00	11,976.00	1.80	2.08
Naguar-I	RMO-435	20.00	50.00	3.99	5.15	29.07	12,413.80	17,746.00	1.91	2.12
Naguar-II	RMO-257	20.00	50.00	5.34	7.00	31.09	12,053.98	25,456.13	2.26	2.75
Jodhpur-II	RMO-257	10.00	46.00	3.40	4.35	27.94	6,650.00	9,955.00	1.76	2.03
Barmer-II	RMO-435	20.00	44.00	2.17	3.47	59.91	3,050.00	5,600.00	1.39	1.47
Barmer-I	RMO-435	27.16	66.00	3.67	4.75	29.43	8,090.00	12,000.00	1.78	2.02
Churu-I	RMO-257	20.00	50.00	4.10	5.45	32.93	9,630.00	15,050.00	1.89	2.40
Jodhpur-I	RMO-40	20.00	50.00	4.15	5.02	20.96	11,350.00	15,300.00	2.15	2.56
Pali	CZM 2	10.00	25.00	4.40	5.40	22.73	5,420.00	8,272.80	1.53	1.76
	Total	197.16	506.00	-	-	-	-	-	-	-
	Average	_	-	4.08	5.24	27.25	9.235.52	14,183,3	1.86	2.18







Performance of Cluster Demonstrations of Green gram during Kharif Season (2019)

Green gram is one of the important pulse crops in India. It is grown 3.50 million ha area in India and around 1.10 to 1.5 million ha area have been reported in Rajasthan. It is a drought resistant crop and suitable for dry land farming and predominantly used as an intercrop with other crops. Green gram supplies protein requirement of vegetarian population of the country. It is a protein rich staple food. It contains about 25 percent protein, which is almost three times that of cereals. It is consumed in the form of split pulse as well as whole pulse. A total of 1278 demonstrations were laid out in 555.00 ha area in Rajasthan and Haryana states during Kharif 2019. Out of total demonstrations, 1136.00 demonstrations conducted in 475.00 ha area of Rajasthan state while 80.00 ha area covered under 132 demonstrations in Haryana. The highest average yield was observed by KVK Hanumangarh-I KVK district i.e., 15.20q/ha under green gram package demonstration including improved variety MH-421.

Table 8.4 Performance of CFLDs on Green gram during Kharif-2019 in Rajasthan

KVK	Variety	Area	CFLDs	Average Yield (q/ha)		%	Net Retur	rn (Rs./ha)	BCR	
	Demonstrated	(ha)		Farmers Practice	CFLDs	increase	Farmers Practice	CFLDs	Farmers Practice	CFLDs
Bikaner-I	MH 421	10.00	25.00	6.73	8.31	23.48	26,226.00	35,022.00	2.69	3.12
Jhunjhunu	MH 421	20.00	50.00	6.70	7.82	16.72	17,090.00	22,180.00	1.86	2.06
Sriganganagar	MH 421	20.00	47.00	8.75	12.00	37.14	36,037.50	53,294.00	3.44	4.35
Bikaner- II	MH 421	20.00	50.00	5.50	6.90	25.45	23,275.00	31,445.00	2.50	2.82
Jaisalmer-I	IPM 2-14	20.00	50.00	5.60	6.80	21.43	23,993.00	32,453.00	2.76	3.10
Jaisalmer-II	GAM-5	10.00	25.00	4.97	5.87	18.11	21,649.00	26,744.00	2.62	2.83
Churu-II	MH 421	10.00	25.00	6.74	8.44	25.22	21,510.00	28,620.00	2.76	3.10
Alwar-I	IPM 2-14	10.00	22.00	5.84	6.55	12.16	16,620.00	23,100.00	2.07	2.31
Sikar	IPM 2-14	20.00	50.00	7.58	8.91	17.55	31,330.00	38,060.00	2.92	3.09
Ajmer	IPM 02-3	30.00	60.00	5.80	8.02	38.28	21,820.00	34,150.00	2.14	2.52
Jaipur-II	IPM 2-14	20.00	50.00	8.00	10.22	27.75	24,220.00	34,258.00	2.28	2.65
Jalore	IPM 02-3	30.00	75.00	5.33	8.49	59.29	18,246.00	41,624.00	2.30	3.44
Naguar-I	GAM-5	10.00	25.00	5.64	7.12	26.24	25,868.00	35,904.00	2.46	2.82
Naguar-II	GAM-5	10.00	25.00	6.15	7.25	17.89	20,817.50	28,370.74	1.89	2.17
Jodhpur-II	GAM-5	10.00	25.00	5.70	5.70	-	23,155.00	42,160.00	2.85	3.86
Sirohi	GAM-5	20.00	50.00	4.78	6.56	37.24	19,909.00	28,768.00	2.43	2.64
Barmer-II	GM-6	10.00	25.00	3.36	5.05	50.30	10,924.00	18,895.00	1.89	2.18
Rajsamand	IPM-02-03	20.00	50.00	3.96	5.23	32.07	8,740.00	15,793.00	1.51	1.86
Hanumangarh-II	MH 421	20.00	50.00	7.40	9.12	23.24	30,023.00	37,368.00	3.09	3.15
Barmer-I	GAM-5	20.00	50.00	4.64	6.15	32.54	14,862.00	21,800.00	2.23	2.57
Churu-I	IPM 2-14	10.00	25.00	4.86	6.70	37.86	14,764.00	25,700.00	2.00	2.72
Jaipur-I	IPM 2-14	20.00	50.00	5.94	7.99	34.51	31,992.00	43,575.50	3.67	4.20





ICAR - ATARI-II, Jodhpur

KVK	Variety	Area	CFLDs	Average Yi	eld (q/ha)	%	Net Retu	rn (Rs./ha)	BC	R
	Demonstrated	(ha)		Farmers Practice	CFLDs	increase	Farmers Practice	CFLDs	Farmers Practice	CFLDs
Tonk	IPM 205-7	15.00	30.00	4.10	5.10	24.39	13,805.00	19,655.00	1.91	2.20
Hanumangarh-I	MH 421	20.00	50.00	7.14	15.20	112.89	24,675.00	31,108.00	2.69	2.77
Alwar-II	IPM 2-14	10.00	22.00	5.84	6.55	12.16	16,620.00	23,100.00	2.07	2.31
Jodhpur-I	GM-4	20.00	50.00	5.50	6.77	23.09	18,975.00	25,105.00	2.44	2.73
Pali	IPM 02-3	40.00	80.00	5.60	6.74	20.31	17,880.00	29,240.75	1.83	2.37
Bhiwani	MH 421	50.00	67.00	7.80	11.00	41.03	21,510.00	28,620.00	2.76	3.10
Mahendergarh	MH 421	30.00	75.00	4.30	5.22	21.40	8,095.00	11,865.00	1.43	1.63
	Total	555.00	1278.00	-	-	-	-	-	-	-
	Average	-	-	5.87	7.65	35.93	20,849.34	29,930.28	2.40	2.78



Performance of Cluster Demonstrations of Black gram during Kharif Season (2019)

Black gram is mainly cultivated in Indian subcontinent. In India Black gram is popular as "Urad dal" and it is highly prized pulse among all the pulses. Black gram is generally grown in loamy soil which has high water retention capacity. Black gram matures normally in 90-120 days and it also enriches the soil with nitrogen (60 kg/ha). India is major producer and consumer of black gram. Total 688 demonstrations were conducted in 260.00 ha in Rajasthan. The highest average yield was observed in Karauli district i.e., 6.80q/ha under package demonstration including improved variety Pratap Urd-1. The crop has been damaged in all most all the black gram growing districts due to heavy rainfall during kharif-2019 season (1250 mm to 2040 mm during rainy season 2019).

Cluster Front Line Demonstrations on Oilseeds



KVK	Variety Demonstrated	Area (ha)	CFLDs	Average Yield (q/ha)		% increase	Net Retu	rn (Rs./ha)	BCR	
				Farmers Practice	CFLDs		Farmers Practice	CFLDs	Farmers Practice	CFLDs
S.Madhopur	Pratap Urd-1	20.00	50.00	3.56	4.00	12.36	6,464.00	9,865.00	1.48	1.55
Karauli	Pratap Urd-1	20.00	50.00	5.10	6.80	33.33	8,620.00	16,530.00	1.42	1.74
Kota	Pratap Urd-1	20.00	50.00	2.50	3.44	37.60	-1,225.00	-345.00	0.92	0.98
Bundi	Pratap Urd-1	20.00	50.00	4.98	6.50	30.52	10,643.00	17,154.00	1.52	1.77
Jhalawar	Pratap Urd-1	20.00	50.00	11.00	Crop fully damaged due to the heav				rainfall.	
Baran	PU-31	20.00	50.00	4.06	4.42	8.87	3,342.00	6,285.00	1.16	1.33
Banswara	Pratap Urd-1	20.00	50.00	1.01	1.37	35.64	-9,200.00	-8,688.00	0.34	0.44
Bhilwara	Pratap Urd-1	10.00	30.00	4.90	6.80	38.78	17,324.00	27,374.00	2.19	2.62
Dungarpur	Pratap Urd-1	20.00	90.00	4.85	1.25	-74.23	-5,740.00	-6,330.00	0.48	0.49
Chittorgarh	Pratap Urd-1	20.00	50.00	3.28	4.58	39.63	4,521.00	9,628.00	1.32	1.58
Rajsamand	Pratap Urd 1	10.00	25.00	4.34	5.49	26.50	9,040.00	15,163.00	1.53	1.85
Pratapgarh	Pratap Urd 1	20.00	50.00	1.90	2.05	7.89	930.00	-203.00	1.10	0.98
Udaipur	Pratap Urd 1	30.00	73.00	3.80	4.90	28.95	6,770.00	14,721.00	1.45	1.74
Tonk	Pratap Urd 1	10.00	20.00	4.30	5.25	22.09	9,010.00	13,325.00	1.58	1.80
	Total	260.00	688.00	-	-	-	-	-	-	-
	Average	-	-	4.26	4.06	16.53	4,321.36	8,177.07	1.18	1.35

Table 8.5 Performance of CFLDs on Black gram during Kharif-2019 in Rajasthan



under National Food Security Mission: Performance of CFLDs during kharif season

During Kharif 2019, a total of 1436 CFLDs on oilseeds were laid out in 587.30 ha area against sanctioned 1225 CFLDs in 490.00 ha area in Rajasthan

and Haryana. Out of 1436 planned demonstrations, 1284 CFLDs were conducted in 517.30 ha areas on groundnut, soybean and sesame in Rajasthan. In Haryana, 152 demonstrations were laid out on sesame in 70.00 ha area by KVKs. The crop wise details are given in table 8.6.



State	Сгор	Т	argets	Ac	hievements
		Area (ha)	Total CFLDs	Area (ha)	Total CFLDs
Rajasthan	Groundnut	170	425	285.30	724
	Soybean	90	225	60.00	145
	Sesame	170	425	172.00	415
	Total	430	1075	517.30	1284
Haryana	Sesame	60	150	70.00	152
	Total	60	150	70.00	152
Gra	nd Total	490	1225	587.30	1436

Table 8.6 Total CFLDs performance on oilseeds in Kharif season

Performance of sesame under CFLDs in Rajasthan state

During Kharif 2019-20, 415 CFLDs of Sesame on full packages were demonstrated in 172.00 ha area

by KVK Jalore, Nagaur-I, Nagaur-II, Jodhpur-II, Sirohi, Rajsamand, Churu-I, Jaipur-I and Pali in Rajasthan. Productivity of sesame was highest in Sirohi district under CFLDs (6.16 q/ha,).

Table 8.7 Performance of CFLDs conducted on sesame in Rajasthan

KVK	Variety District	Area No.	Area No. o	Area No. of		f Yield Obtained (q/ha) J		Increase	Net Retur	n (Rs./ha.)	B:C Ratio	
		average (Yield q/ha)	(ha)	demo	Local	CFLDs	%	Local	CFLDs	Local	CFLDs	
Jalore	RT-351	2.90	10.00	25.00	3.50	5.05	44.29	6875.00	15962.50	1.46	2.02	
Nagaur-I	RT-351	2.36	10.00	25.00	2.95	3.85	30.51	7980.75	12230.22	1.72	1.96	
Nagaur-II	RT-351	3.38	30.00	75.00	3.50	4.53	29.43	12053.98	12019.39	1.38	1.69	
Jodhpur-II	RT-351	3.54	10.00	25.00	3.11	3.50	12.54	19320.00	27875.00	2.58	2.81	
Sirohi	RT-351	2.85	30.00	75.00	4.18	6.16	47.37	13851.00	24103.00	2.04	2.52	
Rajsamand	RT 351	1.95	10.00	25.00	3.40	4.51	32.65	21100.00	29072.00	3.22	3.53	
Churu-I	RT-351	1.60	10.00	25.00	3.21	4.71	46.73	18012.00	31177.00	2.15	3.14	
Jaipur-I	RT-351	4.12	32.00	80.00	4.39	6.14	39.83	13260.77	22074.52	1.87	2.24	
Pali	RT 351	4.20	30.00	60.00	3.90	4.95	26.92	8792.00	13973.00	1.53	1.82	



Fig. 8.1 KVK wise yield increase in Sesame

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Performance of soybean under CFLDs in Rajasthan state

During Kharif 2019, 145 CFLDs of soybean along with packages were demonstrated in 60.00 ha

area in Rajasthan by KVK Kota, Bhilwara-I, Chittorgarh, Rajsamand and Pratapgarh at farmers' fields. The productivity of soybean was highest in Rajsamand district under CFLDs was (19.23 q/ha, Table-8.8).

Table 8.8 Performance of CFLDs conducted on soybean in Rajasthan

KVK Variety	District	Area	No. of	No. of Yield Obtained (q/ha)			Net Return (Rs./ha.)		B:C Ratio		
		average	(ha)	demo	Local	CFLDs	%	Local	CFLDs	Local	CFLDs
Kota	JS 20-34	11.77	10.00	20.00	12.87	16.05	24.71	24498.00	32344.00	2.05	2.19
Bhilwara- I	JS 20-29	10.55	10.00	25.00	3.20	4.40	37.50	-2852.00	-2646.00	0.80	0.86
Chittorgarh	RKS-45	13.14	10.00	25.00	12.64	15.48	22.47	23384.00	31992.00	1.99	2.26
Rajsamand	RKS 24	12.00	10.00	25.00	14.50	19.23	32.62	35200.00	48435.00	3.07	3.33
Pratapgarh	RKS-24	13.88	20.00	50.00	5.60	5.90	5.36	-920.00	-1910.00	0.96	0.92







Performance of groundnut under CFLDs in Rajasthan

During Kharif 2019, 724 CFLDs of groundnut along with packages were demonstrated in 285.30 ha area in

Rajasthan by KVK Bikaner-I, Sriganganagar, Bikaner-II, Sikar, Jaipur-II, Nagaur-I, Nagaur-II, Jodhpur-II, Dungarpur, Churu-II, Chittorgarh, Churu-I and Jaipur-I. The productivity of Groundnut was highest in Bikaner-I district under CFLDs was (31.96 q/ha).

KVK	Variety	District average	Area (ha)	No. of demo	Yield Obtained (q/ha)		Yield Obtained (q/ha)		Yield Obtained In (q/ha)		Increase % Net Return (Rs./ha.)		rn (Rs./ha.)	B:C Ratio	
					Local	CFLDs		Local	CFLDs	Local	CFLDs				
Bikaner I	HNG69	24.31	10.00	25.00	23.30	31.96	37.17	58200.00	127840.00	2.66	3.65				
Sriganganagar	HNG-69	21.72	20.00	44.00	21.91	26.00	18.67	60520.40	109200.00	2.90	3.40				
Bikaner-II	HNG-69	21.72	8.80	18.00	21.82	24.60	12.74	60752.00	103320.00	2.97	3.23				
Sikar	RG-425	22.94	30.00	75.00	21.85	25.92	18.63	70646.00	127915.00	2.90	3.23				
Jaipur-II	HNG-69	21.02	16.50	33.00	22.50	28.69	27.51	55750.00	137712.00	2.07	2.55				
Nagaur-I	HNG-123	17.58	30.00	75.00	22.50	27.79	23.51	84025.00	141471.46	3.75	4.32				
Nagaur-II	HNG-123	18.40	30.00	75.00	21.50	24.71	14.93	58885.00	133961.35	2.02	2.25				
Jodhpur-II	HNG-123	17.19	20.00	25.00	20.50	25.50	24.39	55598.00	122400.00	2.29	2.80				
Dungarpur	GJG 19	12.00	30.00	129.00	14.00	15.52	10.86	36500.00	83400.00	2.08	2.22				
Churu II	HNG 69	24.52	20.00	50.00	19.50	24.02	23.18	44804.00	96088.00	2.52	3.05				
Chittorgarh	GJG-31	13.01	30.00	75.00	15.53	15.09	2.83	33928.00	76808.00	2.14	2.28				
Churu-1	HNG-69	22.80	10.00	25.00	22.10	26.60	20.36	52075.00	122360.00	2.15	2.55				
Jaipur-I	HNG-69	21.02	30.00	75.00	20.70	25.48	23.12	68587.55	129693.20	2.87	3.21				

Table 8.9 Performance of CFLDs conducted on groundnut in Rajasthan





Fig. 8.3 KVK wise yield increase in Groundnut



Performance of sesame under CFLDs in Haryana state

During Kharif 2019, 152 CFLDs of Sesame along with packages were demonstrated in 70.00 ha

area in Haryana by KVK Hisar, Mahendergarh and Rewari. The productivity of sesame was highest in Mahendergarh district under CFLDs (5.78 q/ha).

KVK	Variety	ariety District	Area	rea No. of	Yield Obtained (q/ha)		Increase	Net Return (Rs./ha.)		B:C Ratio	
		average	(ha)	demo	Local	CFLDs	%	Local	CFLDs	Local	CFLDs
Hisar	RT 351	-	20.00	47.00	1.00	1.22	22.00	13500.00	18960.00	0.31	0.34
Mahendergarh	RT-351	4.10	30.00	75.00	4.80	5.78	20.42	35100.00	44825.00	2.98	3.39
Rewari	RT-351	3.40	20.00	30.00	3.90	4.96	27.18	9400.00	16825.00	1.40	1.66

Table 8.10 KVK wise performance of CFLDs conducted sesame in Haryana



Front Line Demonstrations (other than NFSM)

In Rajasthan, demonstrations on oilseed production technologies were laid out on 895 farmers' fields to demonstrate suitable acceptable production technology. Crop wise performance on FLDs is given in table 8.11.

Groundnut: Total 4 KVKs (Alwar-II, Churu-I, Tonk and Dausa) conducted demonstrations at 277 farmers' field over an area of 115.20 ha. The highest yield of 23.74 q/ha was recorded under ICM followed by IDM 19.70 q/ha. The percentage increase in yield was 17.59 and 10.67 ICM and IDM respectively. Weighted mean yield of groundnut was 20.13 q/ha obtained under demonstration which was 19.57% higher over local check.

Sesame: Demonstrations on sesame were conducted by total 5 KVKs (Ajmer, Karauli, Sriganganagar, Tonk and Udaipur - I) at 200 farmers' fields on an area of 88 ha. The highest yield of 5.41q/ha was recorded under ICM compared to local check (4.36q/ha). The yield of soybean was recorded 5.41q/ha with an increase of 28.46% yield. Hence, there is greater need to promote sesame production technology among farmers to increase the productivity at farmers' level.

Soybean: Demonstrations on soybean were conducted by total 4 KVKs (Banswara, Bhilwara, Kota and Udaipur - I) at 141 farmers' fields on an area of 63.20 ha. The highest yield of 7.23q/ha was recorded under ICM compared to local check (5.44q/ha). The yield of soybean was recorded 7.23 q/ha with an increase of 34.300% yield. Hence, there is greater need to promote soybean production technology among farmers to increase the productivity at farmers' level.

FLDs on Pulse Crops other than NFSM

FLDs on pulses were organized on an area of 303.5ha involving 633 farmers of Rajasthan, Haryana and Delhi to show potential of improved technologies. Under the pulses demonstrations, Rajasthan covered 268.5 ha area in the 572 farmers' fields while in Haryana and Delhi 35 ha area FLDs were laid out 61 farmers' fields. FLDs on black gram, green gram, and pigeon pea were undertaken in kharif season. (2019).

Details of FLDs organized by KVKs of Rajasthan

During 2019 Demonstrations were conducted on 572 farmers' fields in an area of 268.5 ha in Rajasthan.

Black gram: FLDs on black gram were undertaken by 2 KVKs (Kota, and Udaipur-II) at 110 farmers' fields in 52.5 ha area. The highest yield of 5.30 q/ha was recorded under ICM whereas local check yield was 4.08 q/ha the percentage increase in demonstration yield was 29.95% over farmer practice with B:C ratio of 1.51. The low yield of black gram reported due to damage of Black gram crops at the stage of flowering, podding maturity as more than 800 mm. rainfall recorded.

Green gram: Total 5 KVKs conducted demonstrations on green gram at 258 farmers' fields covering an area of 146 ha. The highest yield of 6.35q/ha was recorded under IPM followed by varietal evaluation (3.90q/ha). The percentage increase in yield was 35.11 and 21.80,

Crops (KVKs)	Theme	No. of	Area (ba)	•	Weighted Me	an	BCR	
		farmers	(ha)	Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check
Groundnut(4)	ICM	217	85.20	23.74	20.20	17.59	1:2.77	1:2.39
	IDM	60	30.00	19.70	17.80	10.67	1:3.16	1:2.61
	Total	277	115.20	22.69	19.57	15.79	1:2.85	1:2.44
Sesame(5)	ICM	200	88.00	5.41	4.36	28.46	1:2.81	1:2.52
Soybean(4)	ICM	141	63.20	7.23	5.44	34.30	1:1.43	1:1.25
	Grand Total	895	381.6					

Table 8.11 Performance of FLDs on Oilseed Crops in Rajasthan



Crops (KVKs)	Theme	No. of	Area	,	Weighted M	lean	BCR		
		farmers	(ha)	Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check	
Black gram(2)	ICM	110	52.50	5.30	4.08	29.95	1:1.51	1:1.43	
Green gram(2)	IPM	10	4.00	6.35	4.70	35.11	1:1.94	1:1.59	
	Varietal evaluation	248	142.00	3.90	3.20	21.80	1:1.77	1:1.33	
	Total	258	146.00	3.97	3.24	22.16	1:1.78	1:1.34	
Pigeon pea (3)	ICM	204	70.00	12.78	11.19	14.18	1:2.73	1:2.38	
	Grand Total	572	268.5						

Table 8.12 Performance of FLDs on Pulse Crops in Rajasthan

respectively. Overall, average production of 3.97q/ha was recorded under demonstrations than local check (3.24q/ha) as depicted in table 8.22.

Pigeon pea: FLDs on pigeon pea were undertaken by 2 KVKs (Alwar-I, Dholpur and Dungarpur) at 204 farmers' fields in 70 ha area. The highest yield of 12.78 q/ha was recorded under ICM whereas local check yield was 11.19 q/ha the percentage increase in demonstration yield was 14.18% over farmer practice with B:C ratio of 2.73.

Pigeon pea: FLDs on pigeon pea were undertaken by KVK Gurgaon at 61 farmers' fields in 35 ha area. The highest yield of 17.02 q/ha was recorded under ICM whereas local check yield was 13.47 q/ha the percentage increase in demonstration yield was 26.35% over farmer practice with B:C ratio of 3.68.

Performance of Frontline Demonstrations in Rajasthan during 2019

The major crops on which FLDs were undertaken Rajasthan are paddy, maize barley and wheat. The area under FLDs was 766 ha. The FLDs were demonstrated on 2263 farmers' fields. Detailed information about FLDs on cereal crops are depicted in table 8.14.

Maize: Demonstrations on maize were undertaken by 6 KVKs (Banswara, Dungarpur, Pratapgarh, Rajsamand, Sirohi and Udaipur - I) on 311 farmers' fields covering an area of 124 ha. Farmers' obtained attractive remunerative return and B.C. ratio is 1.45 in ICM demonstration.

Paddy: Demonstrations on paddy were conducted by KVK Bundi on 30 farmers' fields covering an area of 12 ha. Average yield 48.99 q/ha was obtained under ICM packages. Farmers have accepted performance of paddy technologies.

FLDs organized by KVKs of Haryana and Delhi

The major crops on which FLDs undertaken in Haryana and Delhi were paddy, barley and wheat. The area under FLDs was 896.2 ha. The FLDs were demonstrated on 2082 farmers' fields. Detailed information about FLDs on cereal crops are depicted in table 8.15.

Crops (KVKs)	Theme	No. of	Area		Weighted Mear	1	BCR		
		farmers (ha)	Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check		
Pigeon pea (1)	ICM	61	35.00	17.02	13.47	26.35	1:4.86	1:3.68	

Table 8.13 Performance of FLDs on Pulse Crops in Haryana & Delhi



	× •										
Crops	Theme	No. of farmers	Area		Weighted Mean		BCR				
(KVKs)			(114)	Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check			
Maize (6)	ICM	311	124.00	24.75	19.75	22.66	1:1.45	1:1.29			
Paddy (1)	ICM	30	12.00	48.99	46.71	4.65	1:3.24	1:2.37			
	Total	341	136.00								

Table 8.14 Performance of FLDs on Cereal Crops in Rajasthan

Table 8.15 Performance of FLD on Cereal Crops in Haryana

Crops (KVKs)	Theme	No. of	Area		Weighted Mean	BCR		
		farmers (ha)	(ha)	Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check
Paddy (7)	ICM	374	151.20	47.14	45.64	3.66	1:1.95	1:1.85

Paddy: Demonstrations were undertaken by 7 KVKs (Faridabad, Kurukshetra, Panipat, Rohtak, Sirsa, Kaithal and Yamuna Nagar) on 374 farmers' fields over an area of 151.20 ha during Kharif 2019. Average yield 47.14 q/ha was obtained by majority of farmers under ICM component. Farmers assured to adopt accepted technologies of paddy in next year.

FLDs on Millets

FLDs on millets were undertaken by KVKs of Rajasthan, Haryana and Delhi during 2019 are as under.

FLDs organized by KVKs of Rajasthan

In Rajasthan, 252 farmers' locations were selected to conduct the FLDs at 127 ha area. The details are given in table 8.16.

Pearl Millet: Pearl millet (Bajra) is most important crop of Arid and Semi-Arid Regions of Rajasthan. Technological packages in ICM mode were demonstrated in participatory approach. Demonstrations were undertaken by 9 KVKs (Alwar-II, Barmer-I, Barmer II, Bikaner-2, Churu II, Jodhpur-I, Jodhpur-II, Nagaur-I and Nagaur-II) at 252 farmers' fields over an area of 127 ha. Farmers obtained 15.14 q/ha yield advantage in the existing resources and prevailing farming situation. Most of farmers showed positiveness towards performance of Pearl Millet technology packages.

FLDs organized by KVKs of Haryana and Delhi

In Haryana, 50 locations were chosen to conduct the FLDs at 20.00 ha. The details of FLDs undertaken are given in table 8.17.

	й С										
Crops (KVKs)	Theme	heme No. of farmers	Area		Weighted Mean	1	В	CR			
			(ha)	Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check			
Pearl millet (9)	ICM	252	127.00	15.14	12.14	27.00	1:2.32	1:2.00			

Table 8.16 Performance of FLDs on Millets in Rajasthan

Table 8.17 Performance of FLD on Millets in Haryana

Crops (KVKs)	Theme	No. of	Area		Weighted Mea	n	В	BCR	
		farmers	(ha)	Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check	
Pearl millet (1)	ICM	50	20.00	26.86	22.45	19.89	1:1.83	1:1.60	



Pearl Millet: Demonstrations were undertaken by Rewari KVK at 50 farmers' fields over an area of 20 ha. Farmers obtained 26.86 q/ha yield advantage in the existing resources and prevailing farming situation. Overall acceptance of farmers towards Pearl Millet technologies were found very encouraging.

FLDs on Commercial Crops

FLDs on commercial crops were conducted at 251 farmers' fields in an area of 95 ha in 2019 land in Zone-II. In Rajasthan, 46 farmers' fields were covered under FLDs on commercial with an area of 19 ha. In Haryana and Delhi, 205 farmers' fields were covered under FLDs on commercial with an area of 76 ha. State-wise details are herein.

FLDs on commercial crops organized by KVKs of Rajasthan

The major crops of Rajasthan on which FLDs undertaken was cotton. The detailed information about FLDs on commercial crop are depicted in table 8.18

Cotton: FLDs on cotton were undertaken by KVK Alwar-II, Jodhpur-II and Hanumangarh-I at 46 farmers' fields in 19 ha area. Out of 46 IPM demonstration the weighted mean yield of 25.78 q/ha was recorded.

FLDs on commercial crops organized by KVKs of Haryana and Delhi

In Haryana and Delhi, demonstrations were undertaken on cotton. FLDs were undertaken on 205

farmers' fields in an area of 76.0 ha land. The performance of demonstration is illustrated in Table 8.19.

Cotton: FLDs on cotton were undertaken by 7 KVKs (Hisar, Fatehabad, Jhajjar, Rohtak, Sirsa and Jind) on 205 farmers' fields in 76 ha area. The highest yield of 20.38 q/ha in ICM demonstration which was 18.03% higher over local check.

FLDs on Others Crops

FLDs on other crops were conducted at 321 farmers' fields in an area of 131.25 ha in Kharif 2019 area in Zone-II. In Rajasthan, 281 farmers' fields were covered under FLDs in cluster bean with an area of 115.25 ha. In Haryana and Delhi, 40 farmers' fields were covered under FLDs on cluster bean with an area of 16.0 ha.

FLDs on Other crops organized by KVKs of Rajasthan

The major crops of Rajasthan on which FLDs undertaken is Cluster bean and cotton. The detailed information about FLDs on cluster bean.

Cluster bean: Ten KVKs (Barmer II, Bikaner-2, Dausa, Dholpur, Dungarpur, Jaipur-I, Nagaur-II, Bikaner-I and Churu II) conducted demonstrations on 281 farmers' fields covering an area of 115.25 ha. The highest yield of 14.27q/ha was recorded under ICM which was 23.14% higher over local check.

Table 0.10 Terrormanee of TED on Commercial crops in Rajastian	Table 8.18	Performance	of FLD	on Com	mercial cro	ps in F	Rajasthan
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Crops (KVKs)	Theme	eme No. of farmers	Area		Weighted Mean	l	ВС	CR
			(ha)	Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check
Cotton (3)	IPM	46	19.00	25.78	21.59	22.30	1:2.52	1:2.25

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Crops (KVKs)	Theme	No. of	Area		Weighted Mean	ı	В	CR
		farmers	(ha)	Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check
Cotton (7)	ICM	205	76.00	20.38	17.49	18.03	1:2.31	1:2.16



Crops (KVKs)	Theme	No. of	Area (ha)		Weighted Mean	ı BC		CR	
		farmers		Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check	
Cluster bean (10)	ICM	256	105.25	14.27	11.67	23.14	1:2.92	1:2.46	
	IDM	25	10.00	11.26	9.90	13.74	1:3.24	1:2.90	
	Total	281	115.25	14.00	11.52	22.32	1:2.94	1:2.49	

Table 8.20 Performance of FLD on cluster bean

FLDs on Other crops organized by KVKs of Harvana and Delhi

In Haryana and Delhi, demonstrations were undertaken on Cluster bean and white button mushroom. FLDs were undertaken on 40 farmers' fields in an area of 16.00 ha land. The performance of demonstration is illustrated in Table 8.21.

Cluster bean: Demonstrations were undertaken by 2 KVKs (Hisar and Rewari) on 40 farmers' fields over an area of 52 ha. The weighted mean yield was recorded 16.00 q/ ha with the B: C ratio of 1.65. Majority of farmers kept 20-25 percent produce as seed for next year large scale multiplication and farmer to farmer extension.

FLDs on Fodder Crops

Livestock sector plays important role to achieve nutritional, economic, and social and livelihood security especially in arid and semi-arid parts of Rajasthan. Availability of green fodder round the year enhances milk yield, total intake of feeds, body weight, etc.

In Zone-II, FLDs on fodder crops were undertaken on 538 farmers' fields covering 77.90 ha area under different farming environments.

Details of FLDs organized in Rajasthan

In Rajasthan, FLDs were conducted at 423locations in 62.60 ha. area. FLDs were laid out on berseem, Napier, pearl millet, oat, and sorghum. Details are given in table 8.22.

Crops (KVKs)	Theme	No. of farmers	Area		Weighted Mean		В	BCR	
			(ha)	Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check	
Cluster bean	ICM	40	16.00	17.88	15.00	20.18	1:1.77	1:1.65	

Table 8.21 Performance of FLDs on commercial crops in Haryana and Delhi

Table 8.22 Performation	nce of FLDs on	Fodder Croj	ps in Rajasthar
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Crops KVKs)	Theme	No. of	No. of Area (ha) Weighted Mean					BCR		
		Tarmers		Demo yield (q/ha) Green Fodder	Local check (q/ha)	Increase in yield (%)	Demo	Check		
Peaarl millet (1)	ICM	20	2.00	629.8	535.8	17.54	1:2.60	1:2.09		
Napier (1)	ICM	20	5.00	349.4	276	26.59	1:3.11	1:2.54		
Sorghum (4)	ICM	185	28.50	409.47	334.82	21.29	1:3.44	1:2.89		
	Total	225	35.50							



Pearl millet: Demonstrations were undertaken by KVK Jaipur-II on 20 farmers' fields in an area of 2.00 ha. Pearl millet has become popular among farming community and majority of farmers have assured for cultivation of pearl millet as fodder in coming kharif season.

Napier grass: Demonstrations were undertaken by Pali KVK at 20 farmers' fields in an area of 5.00 ha. Establishment of Napier grass provide four to five years' green fodder in the same field during stress/scarcity period to maintain health of animals.

Sorghum: Demonstrations were undertaken by KVK Bikaner-I Jaipur-II, Kota and Karauli at 185 farmers' fields over an area of 28.50 ha. during Kharif 2019. It was reported that average 409.47 q/ha green fodder was produced.

FLDs organized by KVKs of Haryana and Delhi

In Haryana and Delhi, FLDs were conducted on 115 locations in 15.30 ha. area. FLDs were carried out on Berseem, Oat and Sorghum (Table 8.23).

Sorghum: Demonstrations were undertaken by 2 KVKs average (Karnal, and Rohtak) at 36farmers' fields over an area of 5.60 ha and green fodder yield was 610.54 q/ha.

FLDs on Horticultural Crops

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

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).

FLDs on Fruit crops

Details of FLDs organized in Rajasthan

In Rajasthan, FLDs were conducted at 50 locations in 13.0 ha. area. FLDs were laid out on Kinnow and Papaya. Details are given in table 8.24.

Kinnow: Kinnow is important fruit crop of Sriganganagar and Hanumangarh districts of Rajasthan. KVKs organized FLDs on IDM component to reduce disease intensity during 2019 under six-year-old know orchard. Farmers obtained average 204.50 q/ha yield of kinnow.

On papaya; FLDs were undertaken by KVK Baran at 10 locations over and area of 3.00 ha. area in ICM mode during 2019 and farmers were acquainted about care and maintenance of papaya plants. more than 90 percent plants fruiting has been observed and

Crops (KVKs)	Theme	No. of	Area	We	ighted Mean		BC	CR				
		farmers	(ha)	Demo yield (q/ha) Green Fodder	Local check (q/ha)	Increase in yield (%)	Demo	Check				
Sorghum (2)	ICM	36	5.60	610.54	451.11	35.75	1:2.63	1:2.16				

Table 8.23 Performance of FLDs on Fodder Crops in Haryana and Delhi

Table 8.24 Performance of FLDs on Fruit Crops in Rajasthan

Crops KVKs)	Theme	No. of	Area (ha)		Weighted Mean	I	B	CR
		Tarmers		Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check
Kinnow (2)	IDM	40	10.00	204.50	178.93	17.21	1:2.38	1:2.11
Papaya (1)	ICM	10	3.00	932.00	785.00	18.73	1:7.77	1:5.06
	Total	50	13.00					



an average yield 932 q/ha was obtained from papaya in comparison to farmers own practices (785.0q/ha). Farmers also fetched an average net return of Rs. 12,18,000 per ha. An average yield 932 q/ha. was obtained from orchards.

FLDs organized by KVKs of Haryana and Delhi

KVKs in Haryana and Delhi conducted FLDs on Guava. The state covered area i.e., 12 ha land under FLDs on 30 farmers' fields (Table 8.25).

Guava: Guava is important fruit crop of Rohtak and Rewari districts of Haryana. KVK Rewari and Rohtak organized FLDs on ICM component to reduce insectpest intensity and improve quality of fruits during 2019 under seven-year-old guava orchard. farmers obtained average 185.83 q/ha yield of guava.

FLDs on Vegetable Crops

FLDs organized by KVKs of Rajasthan

Vegetable cultivation provides additional benefit to farmers. In the present scenario of agricultural development, Majority of farmers are eager to cultivate Vegetables for augmentation of income. Inclusion of Vegetables under different farming systems is the best example of intensification. The major vegetables Brinjal, Bitter gourd, Bottle gourd, Cabbage, Carrot, Cauliflower, Chilli, Okra, Onion, Ridge gourd, Tomato and Vegetable Pea were undertaken under front line demonstration during 2019 (Table 8.26).

Table 8.25 Performance of FLDs on Fruit Crops in Haryana

Crops (KVKs)	Theme	No. of	Area (ha)		Weighted Mea	n	BCR		
		farmers		Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check	
Guava (2)	ICM	30	12.00	185.83	155.83	18.99	1:2.58	1:1.86	

Table 8.26 Performance of FLD on Vegetable Crops in Rajasthan

Crops (KVKs)	Theme	No. of	Area (ba)	•	Weighted Mean		BCR		
		farmers	(ha)	Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check	
Brinjal (1)	ICM	16	4.00	323.00	262.00	23.28	1:5.02	1:4.32	
Tomato (8)	ICM	134	18.00	468.01	368.68	25.10	1:4.60	1:3.83	
	Varietal	10	1.00	216.00	175.25	23.25	1:3.37	1:3.12	
	Total	144	19.00	454.75	358.50	25.01	1:4.53	1:3.79	
Cabbage (1)	ICM	16	4.00	295.00	246.00	19.92	1:3.96	1:3.46	
Bitter gourd (1)	ICM	5	0.25	210.70	182.30	15.58	1:3.12	1:.37	
Bottle gourd (3)	Varietal evaluation	22	12.00	265.68	211.75	25.54	1:3.85	1:3.21	
Carrot (3)	ICM	56	10.25	215.57	195.97	9.97	1:3.69	1:3.43	
Cauliflower (2)	ICM	26	5.00	217.95	186.36	17.12	1:3.96	1:3.31	
Chilli (2)	ICM	20	1.50	236.21	196.29	19.61	1:7.05	1:6.09	
Okra (2)	Varietal	140	13.00	150.38	128.46	17.09	1:4.03	1:3.08	
Onion (7)	ICM	247	42.80	285.85	231.57	24.06	1:3.00	1:2.53	
Ridge gourd (1)	ICM	5	1.00	121.50	78.50	54.78	1:3.23	1:2.40	
	Grand Total	841	131.80						



Brinjal: Demonstrations on brinjal were undertaken by KVK Alwar-I at 16 farmers' fields over an area of 4.0 ha. farmers obtained average 323 q/ha yield and remunerative price during summer season 2019.

Tomato: Demonstrations were undertaken by 8 KVKs (Alwar-I, Banswara, Baran, Bharatpur, Dungarpur, Karauli, Sirohi and Nagaur-II) at 144 farmers' fields in an area of 19.0 ha during Kharif 2019. Keeping quality of produced tomato is quite encouraging. Maximum yield was reported 468.01 q/ha under ICM component.

Bottle gourd: FLDs on bottle gourd were conducted by KVK Bikaner-II, Alwar-II and Nagaur-II at 22 farmers' fields in 12.00 ha. In varietal demonstrations, maximum yield was noticed (265.68 q/ha). An average 25.54% yield enhancement was reported over Farmers practices.

Cabbage: FLDs on cabbage were conducted by KVK Alwar-I at 16 farmers' field in 4.0 ha. In varietal demonstrations, maximum yield was noticed (295.0 q/ha). An average 19.92% yield enhancement was reported over Farmers practices.

Carrot: FLDs on carrot were conducted by three KVKs Sriganganagar, Jaipur-II and Hanumangarh-II at 56 farmers' fields in 10.25 ha. In ICM demonstrations, maximum yield was noticed (215.57 q/ha). An average 9.97% yield enhancement was reported over Farmers practice.

Bitter gourd: FLDs on bitter gourd were conducted by KVK Hanumangarh-I at 5 farmers' field in 0.25 ha during summer season 2019. In ICM demonstrations, maximum yield was noticed (210.70 q/ha). An average 15.58% yield enhancement was reported over Farmers practice.

Chilli: Demonstrations were undertaken by two KVKs (Bharatpur and Alwar-II) at 20 farmers' fields over an area of 1.50 ha. 236.21 q/ha yield was reported in existing situations and available resources.

Cauliflower: Demonstrations were undertaken by two KVKs (Alwar-I and Alwar-II) at 26 farmers' fields over an area of 5.0 ha average during rabi 2019. 217.95 q/ha yield was reported in existing situations and available resources.

Okra: Demonstrations on okra were undertaken by three KVKs (Dungarpur and Karauli) at 140 farmers' fields covering an area of 13.0 ha. Farmers obtained highest yield under varietal evaluation component 150.38 q/ha yield within existing resources and prevailing farming situation.

Onion: Demonstrations on onion were undertaken by seven KVKs (Alwar-I, Banswara, Baran, Dungarpur, Karauli, Nagaur-II and Sikar) at 247 farmers' fields covering an area of 42.80 ha. Farmers obtained 285.85 q/ha yield within existing resources. Overall performance of production technologies of Okra was found quite satisfactory.

Ridge gourd: Demonstrations on ridge gourd were undertaken by KVK Barmer-II at 5 farmers' fields covering an area of 1.00 ha. Farmers obtained 121.50 q/ha yield within existing resources.

FLDs organized by KVKs of Haryana and Delhi

KVKs located in Haryana and Delhi implemented FLDs on vegetable crops which covered 142 farmers' fields in 38.5 ha area. The major vegetables on which FLDs undertaken were Bottle gourd, okra Carrot, Tomato, Pea and Potato (Table 8.27).

Bottle gourd: FLDs on bottle gourd were conducted by KVK Rohtak and Bhiwani at 20 farmers' fields in 9.00 ha. In varietal evaluation demonstrations, maximum yield was noticed (304.67 q/ha). An average 11.22% yield enhancement was reported over Farmers practices.

Carrot: FLDs on carrot were conducted by KVK Rewari at 25 farmers' field in 2.50 ha. carrot demonstrations were laid out on ICM. Maximum yield was reported under ICM (200 q/ha) Farmers obtained good price by adopting low cost management technologies of carrot.

Okra: Demonstrations on okra were undertaken by KVK Rewari at 10 farmers' fields covering an area of 2.00 ha. Farmers obtained highest yield under varietal demonstration 150.00 q/ha within existing resources and prevailing farming situation.

Tomato: Demonstrations were undertaken by KVK Ambala at 16 farmers' fields over an area of 4.00 ha. Maximum yield was reported 340.75q/ha under ICM component.



Crops (KVKs)	Theme	No. of	Area (ba)		Weighted Mean				
		farmers	(ha)	Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check	
Bottle Gourd(2)	Varietal evaluation	20	9.00	304.67	277.17	11.22	1:5.60	1:5.14	
Carrot (1)	ICM	25	2.50	200.00	180.00	11.12	1:3.33	1:3.00	
Okra (1)	Varietal	10	2.00	150.00	120.00	25.00	1:3.75	1:3.00	
Onion(2)	ICM	20	5.00	224.80	187.84	21.43	1:3.97	1:1.26	
Pea(1)	INM	10	4.00	107.00	98.00	9.18	1:3.08	1:3.00	
Tomato(1)	ICM	16	4.00	340.75	295.00	15.51	1:4.54	1:4.21	
	Total	101	26.50						

Table 8.27 Performance of FLDs on Vegetable Crops in Haryana and Delhi

Onion: Demonstrations were undertaken by two KVKs (Rewari and Ambala) at 20farmers' fields over an area of 5.00 ha. FLDs on onion were carried out on ICM at farmers' fields. Maximum yield was reported in ICM component 224.80 q/ha.

Vegetable Pea: Demonstrations were undertaken by KVK Rohtak at 10 farmers' fields over an area of 4.0 ha. Farmers obtained maximum107 q/ha green pods of pea in their fields.

FLDs on Medicinal Crops

Overall, 85 FLDs on Medicinal crops were undertaken covering an area of 34.00 ha during 2019. A total of 85 FLDs were undertaken by KVKs of Rajasthan farmers' fields. The area under demonstrations was 34.00 ha. The details about the FLDs are presented in table 10.19 (Rajasthan).

FLDs organized by KVKs of Rajasthan

In Rajasthan, FLDs on isabgol were laid out (Table 8.28).

Isabgol: FLDs on isabgol were conducted by 3 KVKs (Barmer-I, Barmer-II and Nagaur-I). Under Isabgol demonstrations 85 farmers were covered with an area of 34.00 ha. Farmers received average 9.38q/ha yield in ICM component. farmers fetched net profit of Rs. 64000 to 75800 per ha within 115 days.

FLDs on Hybrid crops

The FLDs on hybrid crops conducted by KVKs were Pearlmillet fodder, Bittergourd, Bottle Gourd, Cauliflower, Chilli, Cotton, Maize, Napier, Okra, Papaya, Pearl millet, Sorghum fodder and Tomato. The detail information about yield, area, BC ratio etc., are given in table 10.23 and 10.24.

FLDs organized by KVKs of Rajasthan

In Rajasthan, FLDs were conducted on Pearl millet fodder, Bitter gourd, Bottle Gourd, cauliflower, Chilli, Cotton, Maize, Napier, Okra, Papaya, Pearl millet, Sorghum fodder and Tomato. Performances of FLDs in Rajasthan are presented in table 8.29.

Crops (KVKs)	Theme	No. of	Area (ha)		BC	CR		
		farmers		Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check
Isabgol (3)	ICM	85	34.00	9.38	7.08	33.05	1:3.52	1:2.82

Table 8.28 Performance of FLD on Medicinal Crops in Rajasthan



Crops (KVKs)	Theme	No. of	Area (ha)		Weighted Mean	n	BCR		
		farmers		Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check	
Tomato (7)	ICM	118	14.00	511.45	396.59	27.53	1:3.97	1:3.25	
	Varietal	10	1.00	216.00	175.25	23.25	1:3.37	1:3.12	
	Total	128	15.00	491.75	381.83	27.25	1:3.93	1:3.24	
Bitter gourd (1)	ICM	5	0.25	210.70	182.30	15.58	1:3.12	1:.37	
Cauliflower (2)	ICM	26	5.00	217.95	186.36	17.12	1:3.96	1:3.31	
Chilli (2)	ICM	20	1.50	236.21	196.29	19.61	1:7.05	1:6.09	
Bottle gourd (1)	Varietal	10	1.00	293.14	241.00	21.63	1:4.44	1:3.86	
Okra (2)	Varietal	140	13.00	150.38	128.46	17.09	1:4.03	1:3.08	
Papaya (1)	Varietal	10	3.00	932.00	785.00	18.73	1:7.77	1:5.06	
	Grand Total	339	38.75						

Table 8.29 Performance of FLDs on Hybrid Crops (Vegetables and fruits) in Rajasthan

Table 8.30 Performance of FLDs on Hybrid varieties of crops in Rajasthan

Crops (KVKs)	Theme	No. of	Area (ha)		Weighted M	ean	BCR	
		farmers		Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check
Cotton (3)	IPM	46	19.00	25.78	21.59	22.30	1:2.52	1:2.25
Maize (5)	ICM	234	124.00	24.75	19.75	22.66	1:1.45	1:1.31
Pearlmillet (8)	ICM	227	117.00	14.16	11.34	27.30	1:2.12	1:1.82
Pearl millet fodder (1)	ICM	20	2.00	629.80	535.80	17.54	1:2.60	1:2.09
Napier grass (1)	IWM	20	5.00	349.40	276.00	26.59	1:3.11	1:2.54
Sorghum Fodder (3)	ICM	145	18.50	441.62	353.65	23.78	1:2.31	1:2.05
	Grand Total	692	285.5					

Papaya: Demonstrations on brinjal were conducted by KVK Baran on 10 locations in 3.0 ha area. Average yield was 932 q/ha with BC ratio 1:7.77.

Tomato: Demonstrations on tomato were conducted by 7 KVKs i.e., Nagaur-II, Banswara, Baran, Bharatpur, Dungarpur, Karauli and Sirohi on 128 farmers' fields covering 15.0 ha land. Farmers viewed that keeping quality of hybrid tomato is quite satisfactory and good remunerations were obtained by farmers.

Bittergourd: Demonstrations on bittergourd were conducted by KVK Hanumangarh-I on 05 locations in

0.25 ha land. Average yield was 210.70 q/ha with BC ratio 1:3.12.

Cauliflower: Demonstrations on bottle gourd were conducted by Alwar-I and Alwar-II KVKs 26 locations in 5.0 ha. Average yield was 217.95 q/ha with BC ratio 1:3.96. Size of Cauliflower was attractive and market price was also better in comparison to farmers varieties.

Chilli: Demonstrations on chilli hybrid varieties were conducted by two KVKs i.e., Alwar-II and Bharatpur on 20 farmers' fields covering 1.5 ha land.



Bottle gourd: Demonstrations on bottle gourd hybrid were conducted by KVK Alwar-II on 10 farmers' fields covering 1 ha land.

Okra: Demonstrations on okra hybrid were conducted by two KVKs i.e., Dungarpur and Karauli on 140 farmers' fields covering 13.00 ha land. Farmers fetched attractive price due to colour, size and keeping quality of hybrid okra.

Cotton: FLDs on hybrid cotton were conducted by three KVKs (Alwar-II, Jodhpur-II and Hanumangarh-I) 46 farmer's locations in 19 ha area during 2019. Being a commercial crop, farmers received more profit and BC ratio was reported 1:2.52.

Napier grass: Demonstrations on hybrid Napier grass were conducted by KVK Pali on 20 locations in 5.00 ha for fodder purpose. Growth of plants is more than 4.00 to 4.75 feet.

Fodder pearl millet: Demonstrations on hybrid Napier grass were conducted by KVK Jaipur-II on 20 locations in 2.00 ha for fodder purpose. In corporation of Napier as fodder enhanced feed intake and improve milk yield cattle.

Fodder Sorghum: Demonstrations on hybrid napier grass were conducted by 3 KVKs (Jaipur-II, Karauli

and Kota) on 145 locations in 18.50 ha for fodder purpose. Use of hybrid seed of sorghum enhanced fodder productivity and farmers obtained average yield of 441.62 q/ha.

Pearl millet: The FLDs on hybrid pearl millet were conducted by eight KVKs i.e., Nagaur-I, Alwar-II, Barmer II, Barmer-I, Bikaner-2, Churu II, Jodhpur-I and Jodhpur-II on 227 farmers' fields in 117 ha area. Hybrid pearl millet varieties are preferred by farmers as short duration, higher yield, disease resistant, draught tolerant features etc.

Maize: The FLDs on hybrid maize were conducted by 5 KVKs i.e., Banswara, Pratapgarh, Rajsamand, Sirohi and Udaipur - Ion 234 farmers' fields in 124 ha area. Hybrid maize varieties are preferred by farmers as short duration, higher yield, disease resistant, draught tolerant features etc.

FLDs organized by KVKs of Haryana and Delhi

In Haryana and delhi, FLDs were conducted on Cotton, Okra, Pearl millet, Sorghum fodder and Tomato. Achievements of FLDs in Haryana and Delhi are presented in table 8.31.

Crops (KVKs)	Theme	No. of farmers	Area (ha)		Weighted Me	BCR		
				Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check
Tomato(1)	ICM	16	4.00	340.75	295.00	15.51	1:4.54	1:.42
Okra (1)	Varietal	10	2.00	150.00	120.00	25.00	1:3.75	1:3.00
	Grand Total	26	6.00					

Table 8.31 Performance of FLDs on Hybrid varieties (Vegetables and fruits) in Haryana and Delhi

Table 8.32 Performance of FLDs on Hybrid varieties of crops in Haryana and Delhi

Crops (KVKs)	Theme	No. of farmers	Area (ha)		Weighted Me	BCR		
				Demo yield (q/ha)	Local check (q/ha)	Increase in yield (%)	Demo	Check
Cotton (6)	ICM	205	76.00	20.38	17.49	18.03	1:2.31	1:2.16
Pearlmillet (1)	ICM	50	20.00	26.86	22.45	19.89	1:1.83	1:1.60
Sorghum Fodder (1)	ICM	24	5.00	620.00	445.00	39.33	1:2.61	1:2.12
	Grand Total	279	101					



Tomato: Demonstrations on hybrid varieties tomato were conducted by KVK Rewari on 16 farmers' fields covering 4.00 ha. Farmers obtained an average yield 340.75q/ha tomato and more profit was also reported. Size & color of tomato were quite attractive and keeping quality is more in comparison to existing varieties.

Okra: Demonstrations on hybrid varieties okra were conducted by KVK Ambala on 10 farmers' fields covering 2.00 ha. Farmers obtained an average yield 150 q/ha okra and more profit was also reported.

Cotton: Demonstrations on cotton were conducted by 6 KVKs (Fatehabad, Hisar, Jhajjar, Jind, Rohtak and Sirsa) on 205 farmers' fields covering 76 ha. Farmers fetched better return under demonstrations.

Pearlmillet: Demonstrations on hybrid varieties of pearl millet were conducted by KVK Rewari on 50 farmers' fields covering 20.00 ha. Use of hybrid seed of pearl millet enhanced productivity and farmers obtained average yield of 26.86q/ha.

Sorghum fodder: Demonstrations on hybrid varieties of sorghum fodder were conducted by 1 KVK (Karnal) on 20 farmers' fields covering 5.00 ha. Use of hybrid

seed of sorghum enhanced fodder productivity and farmers obtained average yield of 620q/ha.

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, Haryana and Delhi states, use of farm implements under different field operations and postharvest processing plays important role in enhancing efficiency, efficacy, reducing drudgery and saving time. There are situation and operation specific implements developed and promoted by research institutes, 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;

FLDs organized by KVKs of Rajasthan

In Rajasthan, KVK Churu-I, Jaisalmer-II, Jhalawar, Tonk and Udaipur-I conducted 359 FLDs on the farm implements. The details are given in table 8.33.

District	Name of the implement	Сгор	Technology demonstrated	No. of Farmer	Area (ha)	Major parameters	Field observation (output/man hour)		% change in major parameter
Churu-I	Groundnut decorticator	Groundnut	Decortication technology	5	-	Decortication (kg/h)	25.2	8.70	189.6%
Jaisalmer-II	Milking Stand with Stool	Cattle	Drudgery reduction technology	10	-	User Acceptability of technology	58	61	67.21
Jhalawar	Serrated Sickle	Fodder crop	Drudgery reduction	45	-		7	9	22.22
Jhalawar	Khurapi	Kitchen Garden	Khurapi	45		Land peroration	6	8	25.0
Jhalawar	Maize Sheller	Maize	Maize Sheller	44		Threshing	4	8	50.0
Jhalawar	Spiral Seed Grader	Mustard	Spiral Seed Grader	15		Grading	6	10	40.00

Table 8.33 Performance of FLD on Farm Implements



ICAR - ATARI-II, Jodhpur

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District	Name of the implement	Сгор	Technology demonstrated	No. of Farmer	Area (ha)	Major parameters	Field observation (output/man hour)		% change in major parameter
Jhalawar	Rake (Karcha) Iron	Kitchen Garden	Rake (Karcha) Iron	90		Field preperation, drudgery reduction	7	10.5	33.30
Jhalawar	Spade with welded iron handle	Field Crops	Spade with welded iron handle	88		Field preperation, drudgery reduction	5	9	44.44
Tonk	Groundnut decorticator	Groundnut	Decortication technology	13	-	Decortication (kg/h)	25	2	1150
Udaipur-I	Tokari thresher	Wheat	Threshing with safety	4	-	Labour Requirement (number)	03	05	40.00
			Total	359					

FLDs organized by KVKs of Haryana

In Haryana, 1010 FLDs were undertaken in 476.00 ha land on the farm implements. The KVKs

were Ambala, Hisar, Jhajjar, Mahendragarh, Rewari and Yamunanagar. The details about FLDs on the farm implements are given in table 8.34.

Table 8.34 Performance of FLD on Farm Implements

District	Name of the implement	Сгор	Technology demonstrated	No. of Farmer	Area (ha)	Major parameters	Filed observation (output/man hour)	Local check	% change in major parameter
Ambala	Zero tillage seed drill	Wheat	Sowing Implements	10	4.00	Yield	56.50	52.00	8.65%
Ambala	Happy Seeder	Wheat	Sowing Implements	100	100.00	Yield	52.94	52.15	1.51%
Hisar	Happy Seeder	Wheat	Sowing Implements	200	100.00	Yield	57.50	54.00	6.48%
Jhajjar	Zero tillage seed drill	Wheat	Sowing Implements	150	60.00	Yield	51.80	48.10	7.69%
Jhajjar	Happy Seeder	Wheat	Sowing Implements	150	60.00	Yield	53.20	48.70	9.24%
Mahendragarh	Zero tillage seed drill	Wheat	Sowing Implements	250	100.00	Cost of cultivation and crop yield	51.50	49.00	5.10%
Rewari	Zero tillage seed drill	Wheat	RCT	15	6.00	BCR, CC, Labour reduction, Net Return	0.35	1.45	75.86



District	Name of the implement	Сгор	Technology demonstrated	No. of Farmer	Area (ha)	Major parameters	Filed observation (output/man hour)	Local check	% change in major parameter
Rewari	Hand operated aonla pricking machine	Aonla	Pricking of Aonla by Hand operated aonla pricking machine	20		Labour reduction, time, quality of product	0.70	1.00	30.00
Rewari	Twine hand wheel hoe	Bajra	Weed Control	25	10.00	Labour reduction,BCR,Net Return	3.00	6.00	50.00
Yamunanagar	Happy Seeder	Wheat	Sowing Implements	90	36.00	Yield	58.40	55.30	5.61%
			Total	1010	476.00				

FLD on Kitchen Garden

For ensuring nutritional security KVKs are actively involved in promotion & development of kitchen garden models in the selected villages to enhance availability of seasonal vegetables in daily diet for nutritional security. KVKs of Rajasthan, Haryana & Delhi conducted Front Line Demonstrations on kitchen gardening at 2384 farmer's fields.

More than 90 percent farm women are engaged in conductance of demonstrations of seasonal vegetables. It has been reported that on an average 100 sqm meter area has been covered at each farmer's field. farm women purchase of vegetables from market has stopped and Rs. 20/- to 50/- saving by development of kitchen gardening has been noticed by each farm women in selected villages.

FLDs on Livestock

Performance of FLDs on live stock in Rajasthan, Haryana & Delhi

In Rajasthan, KVK Ajmer, Alwar-II, Baran, Bharatpur, Churu-II, Dausa, Hanumangarh-I, Jaipur-II, Jalore, Karauli, Tonk, Udaipur-I and Ambala organized FLDs on Livestock on 2062 units at 659 farmers field (Table 8.35)

Category	Thematic area	Name of the technology demonstrated	No. of Farmer	No. of Units (Animal/ Poultry/	Major pa	% change in major	
				Birds, etc)	Demo	Check	parameter
Ajmer							
Poultry	Poultry management	Popularization of indigenous germ plasm i.e. Kadaknath	10	400	150 egg	110 egg	36.36
Alwar-II							
Cattle	Nutrient management	Mineral mixture	10	10	19 Months	22 months	16

Table 8.35 Details of FLDs organized on live stock



ICAR - ATARI-II, Jodhpur

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Category	Thematic area	Name of the technology demonstrated	No. of Farmer	No. of Units (Animal/ Poultry/	Major pa	rameters	% change in major
	Birds, etc		Birds, etc)	Demo	Demo Check		
Baran							
Poultry	Poultry management	Improved Chick Nirbheek	95	950	180 egg	48 egg	73.33
Bharatpur							
Buffalo	Mitigation of Mineral & vitamin deficiency	mineral mixture	109	109	9.0 Litre milk per day	8.0 Litre milk per day	12.5
Churu-II							
Buffalo	Feeding management	Azolla feeding	50	50	8.39 Litre milk per day	7.57 Litre milk per day	10.8
Dausa							
Buffalo	Animal feeding management	Use of mineral mixture in milch animal	40	40	6.84 Litre milk per day	6.21 Litre milk per day	10.06
Hanumangarh-I							
Cattle	Animal feeding management	Use of mineral mixture in milch animal	10	10	12.5 Litre milk per day	10.8 Litre milk per day	15.74
Jaipur-II							
Buffalo	LPM	Mineral Mixture	20	20	10.28 Litre milk per day	9.20 Litre milk per day	11.68
Buffalo (TSP)	LPM	Mineral Mixture + ivermectine	50	50	10.75Litre milk per day	9.10 Litre milk per day	18.13
Poultry	Poultry management	Back Yard Poultry-curoilar	15	15	1797g(6month)	1207g (6 month)	48.88
Jalore							
Sheep & Goat	Animal Nutrition Management	Effect of concentrate supplementation on growth of lambs.	50	50	44.67 g average daily weight gain	12.08 average daily weight gain	269.78
Karauli							
Poultry	Poultry management	Dual Purpose Cruoiler	20	50	148 egg	55 egg	169
Tonk							
Buffalo	Area specific Mineral Mixture	40-50 gram Area specific Mineral Mixture was given to milch buffaloes	5	5	7.8 Litre milk per day	5.7 Litre milk per day	36.84



Category	Thematic area	Name of the technology demonstrated	No. of Farmer	No. of Units (Animal/ Poultry/	Major pa	% change in major	
	Birds, etc)		Birds, etc)	Demo Check		parameter	
Udaipur-I							
Cattle	Feed Management	Area Specific Mineral Mixture	54	54	3.7 Litre milk per day	3.2 Litre milk per day	15.63
Buffalo	Feed Management	Area Specific Mineral Mixture	79	79	2.9 Litre milk per day	2.5 Litre milk per day	16
Ambala							
Poultry	Poultry management	Demonstration on Chabron Poultry	32	160	170 egg	80 egg	111
Buffalo	Feeding management	Azolla feeding	5	5	27.2 Litre milk per day	25.4Litre milk per day	7.1
Cattle	Feeding management	Azolla feeding	5	5	11.3 Litre milk per day	10.5 Litre milk per day	7.6
		Total	659	2062			

Front Line Demonstrations on feeding & management components were organized on poultry, goat, sheep, cattles by different KVKs during 2019. Farmers played as contributor and facilitator role in demonstrations. Based on feeding and management demonstrations, observations on different parameters

were calculated and same is presented in above table. More than 65 percent farmers accepted performance of demonstrations also assured for application and use of affordable technological components as per suitability and existing resources.



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TRAINING ACHIEVEMENTS

The Krishi Vigyan Kendra (KVK) is an innovative science based Farmer Centric based Centre which 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 and improve competencies, in-service training courses are organized for extension personnel/workers of the concerned district. 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 given in Table 9.1 to 9.15.

Crop Production

Under crop production, a total number of 1608 courses were organized by KVKs - Rajasthan (877), Haryana (689) and Delhi (42) benefiting 37568 participants. The state wise details are presented in Table 9.1.

Area of Training	Rajasthan		H	aryana	Delhi		
	С	Р	С	Р	С	Р	
Weed Management	91	2590	52	1125	2	42	
Resource Conservation Technologies	17	510	148	4960	8	160	
Cropping Systems	28	925	15	340	2	40	
Crop Diversification	35	1160	24	715	2	32	
Integrated Farming	130	3415	16	430	4	78	
Micro Irrigation/irrigation	42	962	12	430	3	48	
Seed production	46	1640	16	526	4	65	
Nursery management	18	360	14	250	4	76	
Integrated Crop Management	290	9560	160	4050	2	38	
Soil & water conservation	28	526	16	418	3	45	
Integrated nutrient management	46	1265	42	1130	4	65	
Production of organic inputs	82	1650	36	716	2	62	
Others	24	728	138	2530	2	36	
Total	877	25291	689	17620	42	787	

Table 9.1 Training on Crops Production including sponsored

C-No of Courses; P-Participants





On campus Training programme at KVK, Jalore

Horticulture

KVKs of the zone organized 849 training programmes in which 19108 farmers / farm women took part. Various aspects were covered under the training programmes viz. vegetable crops (358), fruit production (248), ornamental plants (36), plantation crops (19), tuber crops (31), spices (115) and medicinal & aromatic plants (42), involving 7493, 4682, 242, 168, 153, 1508 and 320 participants, respectively. The state wise details of specific courses and participants are given in Table 9.2.



Sponsored training programmes on seed spices and quality improvement – KVK, Barmer-II

Area of Training	Rajasthan		Haryana		Delhi	
	С	Р	С	Р	С	Р
a) Vegetable Crops						
Production of low value and high volume crops	52	1320	42	1050	2	42
Off-season vegetables	23	612	11	325	2	36
Nursery raising	50	1050	22	768	1	18
Exotic vegetables	11	240	6	98	2	42
Export potential vegetables	6	92	5	86	1	16
Grading and standardization	16	428	10	166	2	32
Protective cultivation	40	290	16	380	3	74
Others (pl specify)	24	625	10	94	1	14
Total (a)	222	4657	122	2967	14	274

Table 9.2 Training on Horticulture including sponsored


Area of Training	Rajasthan		Ha	iryana	Delhi		
	С	Р	С	Р	С	Р	
b) Fruits							
Training and Pruning	18	424	11	162	1	16	
Layout and Management of Orchards	42	1120	16	428	2	34	
Cultivation of Fruit	28	828	22	526	1	10	
Management of young plants/orchards	11	342	20	396	2	36	
Rejuvenation of old orchards	7	132	2	35	1	18	
Export potential fruits	4	86	2	32	1	16	
Micro irrigation systems of orchards	13	384	4	65	1	13	
Plant propagation techniques	11	215	5	87	2	38	
Others (pl specify)	14	178	6	114	1	12	
Total (b)	148	3709	88	1845	12	193	
c) Ornamental Plants							
Nursery Management	4	74	6	114	4	65	
Management of potted plants	3	36	2	16	0	0	
Export potential of ornamental plants	1	18	1	13	1	24	
Propagation techniques of Ornamental Plants	6	116	2	38	1	16	
Others (pl specify)	4	76	1	16	0	0	
Total (c)	18	320	12	197	6	105	
d) Plantation crops							
Production and Management technology	4	68	4	80	1	12	
Processing and value addition	6	110	2	38	1	16	
Others (pl specify)	1	18	0	0	0	0	
Total (d)	11	196	6	118	2	28	
e) Tuber crops							
Production and Management technology	8	154	5	96	2	42	
Processing and value addition	4	80	3	56	1	12	
Others (pl specify)	5	92	3	50	0	0	
Total (e)	17	326	11	202	3	54	
f) Spices							
Production and Management technology	40	1532	11	178	2	38	
Processing and value addition	8	125	4	62	0	0	
Others (pl specify)	42	870	8	118	0	0	
Total (f)	90	2527	23	358	2	38	



Area of Training	Raj	asthan	Ha	ryana	Delhi	
	С Р		С	Р	С	Р
g) Medicinal and Aromatic Plants						
Nursery management	6	110	2	40	1	18
Production and management technology	8	220	1	20	0	0
Post harvest technology and value addition	4	68	3	54	0	0
Others (pl specify)	12	378	3	48	2	38
Total (g)	30	776	9	162	3	56
GT (a-g)	536	12511	271	5849	42	748

Soil Health and Fertility Management

A total number of 359 training programmes were organized by KVKs for 11205 farmers and farm women. The major areas on which training programmes conducted were soil fertility management (72), integrated water management (16), integrated nutrient management (55), production and use of organic inputs (37), management of problematic soils (21), micro nutrient deficiency in crops (25), nutrient use efficiency (17), balance use of fertilizers (19), soil and water testing (78) and others (19). The state wise details are given in Table 9.3.

Table 9.3 Training on soil health and fertility management including sponsored

Area of Training	Raj	asthan	Haryana		D	elhi
	С	Р	С		С	Р
Soil fertility management	48	1420	26	725	4	78
Integrated water management	15	260	16	380	2	44
Integrated Nutrient Management	40	890	36	610	4	56
Production and use of organic inputs	42	925	8	140	2	34
Management of Problematic soils	18	414	14	320	1	17
Micro nutrient deficiency in crops	11	425	18	468	2	38
Nutrient Use Efficiency	13	270	18	370	1	18
Balance use of fertilizers	10	180	22	438	2	36
Soil and Water Testing	24	720	65	1830	1	12
Others (pl specify)	11	320	14	780	1	18
Total	232	5824	237	6061	20	351

C-No of Courses; P-Participants

Livestock Production and Management

KVKs of Rajasthan, Haryana and Delhi organized a total number of 606 training programmes including 19163 farmers took active part. The specific training programmes were dairy management (265),

poultry management (50), rabbit management (2), animal nutrition management (63), disease management (57), feed & fodder management (101), production of quality animal (13) and others (53). The state wise details are given in Table 9.4.



Area of Training	Raja	asthan	Haryana		D	elhi
	С	Р	С	Р	С	Р
Dairy Management	213	9500	50	1230	2	42
Poultry Management	42	1125	8	142	0	0
Piggery Management	0	0	2	32	0	0
Rabbit Management	2	42	0	0	0	0
Animal Nutrition Management	58	1650	4	80	1	18
Disease Management	54	1610	2	38	1	18
Feed & fodder technology	98	2024	2	32	1	16
Production of quality animal products	11	216	1	14	1	18
Others (pl specify)	18	380	34	920	1	16
Total	496	16547	103	2488	7	128

Table 9.4 Training on livestock production and management including sponsored

Home Science/women empowerment

KVKs of this zone organized a total number of 615 training programmes for 15073 beneficiaries. The major areas were Household food security by kitchen gardening and nutrition gardening (100), Design and development of low/minimum cost diet (42), Designing and development for high nutrient efficiency diet (26), Minimization of nutrient loss in processing (28),

Processing and cooking (22), Gender mainstreaming through SHGs (28), Storage loss minimization techniques (25), Value addition (150), Women empowerment (35), Location specific drudgery reduction technologies (46), Rural Crafts (9), Women and child care (60), and Others (44)The state wise details are given in Table 9.5.

Table 9.5 Training on	Home Science,	/women empowerment	including sponsored
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Area of Training		sthan	Hai	yana	Delhi	
		Р	С	Р	С	Р
Household food security by kitchen gardening and nutrition gardening	70	1820	28	714	2	36
Design and development of low/minimum cost diet	27	645	13	260	2	38
Designing and development for high nutrient efficiency diet		340	12	240	1	10
Minimization of nutrient loss in processing		312	16	360	0	0
Processing and cooking	12	246	9	216	1	18
Gender mainstreaming through SHGs	20	430	7	148	1	12
Storage loss minimization techniques	16	328	8	168	1	16
Value addition	84	2360	62	1680	4	80
Women empowerment	21	603	12	432	2	38
Location specific drudgery reduction technologies	24	508	21	448	1	14



Area of Training	Rajasthan		Haryana		Delhi	
	С	Р	С	Р	С	Р
Rural Crafts	5	68	3	51	1	8
Women and child care	32	616	27	814	1	16
Others (pl specify)	18	296	24	650	2	34
Total	354	8572	242	6181	19	320



Training on Drudgery Reduction - KVK Fatehabad

Agricultural Engineering

A total number of 296 training programmes were organized by KVKs of this zone benefiting 6551 farmers. Major areas of trainings were repair and maintenance of Farm Machinary and its maintenance (100), Installation and maintenance of micro irrigation systems (31), Use of Plastics in farming practices (22), Repair and maintenance of farm machinery and implements (68), Small scale processing and value addition (23), Post Harvest Technology (31) and Others (21). The details are given in Table 9.6.

Area of Training	Raja	sthan	than Har		D	elhi
	С	Р	С	Р	С	Р
Farm Machinary and its maintenance	22	510	75	1680	3	60
Installation and maintenance of micro irrigation systems	18	424	11	360	2	40
Use of Plastics in farming practices	10	164	8	145	4	66
Repair and maintenance of farm machinery and implements	17	160	48	1570	3	54
Small scale processing and value addition	8	136	14	310	1	16
Post Harvest Technology	17	190	12	220	2	32
Others (pl specify)	6	116	14	280	1	18
Total	98	1700	182	4565	16	286

Table 0.6	Training (on agricultural	anginaaring	including	enoncored
1 auto 9.0	Training C	JII agricultural	engineering	menuumg	sponsoreu

C-No of Courses; P-Participants



Plant Protection

Training programmes related to plant protection constituted 595 courses for 17190 farmers of Rajasthan, Haryana and Delhi. The various aspects like integrated pest management (313), integrated disease management (168), bio-control of pests and diseases (50), production of bio control agents and bio pesticides (21) and others (43). The state wise details are given in Table 9.7.

Table 9.7 Training on plant protection including sponsored

Area of Training	Rajasthan		Har	yana	Delhi	
	С	Р	С	Р	С	Р
Integrated Pest Management	176	4610	126	4320	11	156
Integrated Disease Management	84	2160	82	2490	2	34
Bio-control of pests and diseases	31	908	18	510	1	16
Production of bio control agents and bio pesticides	18	430	2	32	1	16
Others	22	708	20	788	1	12
Total	331	8816	248	8140	16	234

C-No of Courses; P-Participants

Fisheries

Training programmes related to fisheries constituted 8 courses for 112 farmers of Rajasthan. The

various aspects like Integrated fish farming and composite fish culture. The details are given in Table 9.8.

Table 9.8 Training on Fisheries

Area of Training	Rajasthan		Hai	ryana	Delhi		
	С	Р	С	Р	С	Р	
Integrated fish farming	4	48	1	12	0	0	
Composite fish culture	2	40	1	12	0	0	
Total	6	88	2	24	0	0	

C-No of Courses; P-Participants

Production of Input at the site

Production of input at the site related 217 training programmes were conducted by KVKs to train

4863 farmers and farm women. The state wise details are given in Table 9.9.

Area of Training	Rajasthan		Ha	ryana	Delhi		
	C P		С	Р	С	Р	
Bio-pesticides production	2	46	1	12	1	14	
Bio-fertilizer production	3	96	2	42	0	0	
Vermi-compost production	44	1160	18	468	4	68	



Area of Training	Rajasthan		Ha	ryana	Delhi		
	С	Р	С	Р	С	Р	
Organic manures production	42	1050	16	324	2	42	
Production of livestock feed and fodder	4	60	2	32	1	14	
Mushroom Production	16	213	8	140	3	54	
Apiculture	12	226	3	58	1	18	
Others (pl specify)	2	36	30	690	0	0	
Total	125	2887	80	1766	12	210	



Spawning method of oyster mushroom in Skill Development Training on Musroom Growers - KVK, Ajmer

Capacity Building and Group Dynamics

A total of 365 specialized training courses on capacity building and group dynamics were organized

for 8807 participants. The state wise details are given in Table 9.10.

Area of Training	Rajas	sthan	Har	yana	Delhi		
	С	Р	С	Р	С	Р	
Leadership development	24	590	12	190	0	0	
Group dynamics	27	660	30	870	1	18	
Formation and Management of SHGs	46	1220	16	216	2	34	
Mobilization of social capital	31	738	12	196	1	14	
Entrepreneurial development of farmers/youths	53	1410	42	1320	2	36	
WTO and IPR issues	44	520	4	38	1	25	
Others (pl specify)	4	180	12	520	1	12	
Total	229	5318	128	3350	8	139	

Table 9.10 Training on Capacity Building and Group Dynamics

C-No of Courses; P-Participants



Agro Forestry

Agro forestry related 142 training programmes were organized by KVKs of Rajasthan for 3190 practicing farmers. The details of training programmes and participants are given in Table 9.11.

Area of Training	Rajasthan C P		Har	yana	Delhi		
			С	Р	С	Р	
Production technologies	7	216	30	1080	0	0	
Nursery management	22	318	18	320	2	38	
Integrated Farming Systems	24	360	12	280	1	18	
Others (pl specify)	17	428	8	116	1	16	
Total	70	1322	68	1796	4	72	

Table 9.11 Training on Agro forestry

C-No of Courses; P-Participants

Vocational Training programmes

A total number of 307 vocational trainings conducted by KVKs in zone comprising 161 in Rajasthan, 136 in Haryana and 10 in Delhi benefiting 5712 participants. The major areas were crop production and management (63), post harvest technology and value addition (69), livestock and fisheries (45), income generation activities (120) and agricultural extension (10). The state wise details are given in Table 9.12.

Table 9.12 Vocational Training programmes

Area of Training	Rajasthan		Har	yana	Delhi		
	С	Р	С	Р	С	Р	
Crop production and management	40	320	21	460	2	36	
Post harvest technology and value addition	44	456	24	510	1	18	
Livestock and fisheries	26	370	18	411	1	12	
Income generation activities	45	860	70	1970	5	98	
Agricultural Extension	6	128	3	50	1	13	
Grand Total	161	2134	136	3401	10	177	

C-No of Courses; P-Participants

Rural youth

For the rural youth a total number of 482 training courses were organized in which 9948 rural youth including male and female acquired skill for gainful employment at their doorstep. The state wise details of training programmes and participants are given in Table 9.13.

Extension Personnel

A total number of 295 training courses were organized in which 5596 extension personnel took part. Out of which Rajasthan organized 155 training courses with 2985 participants whereas Haryana organized 129 courses with 2418 participants and in Delhi 11 training course with 193 participants. The state wise details of training programmes and participants are given in Table 9.14.



Area of Training	Rajas	sthan	Har	yana	Delhi	
	С	Р	С	Р	С	Р
Nursery Management of Horticulture crops	17	340	6	123	1	14
Training and pruning of orchards	12	140	3	54	1	16
Protected cultivation of vegetable crops	11	108	4	73	1	12
Commercial fruit production	8	132	2	38	0	0
Integrated farming	11	230	4	116	1	18
Seed production	12	260	4	80	1	18
Production of organic inputs	12	270	2	34	1	12
Planting material production	12	210	2	39	1	18
Vermi-culture	12	244	4	76	1	18
Mushroom Production	16	310	22	590	2	34
Bee-keeping	6	126	4	64	1	18
Sericulture	0	0	0	0	0	0
Repair and maintenance of farm machinery and implements	4	65	8	110	1	13
Value addition	52	1290	24	560	4	66
Small scale processing	8	210	7	320	1	12
Post Harvest Technology	8	140	8	160	1	18
Tailoring and Stitching	12	210	22	480	1	14
Rural Crafts	6	78	4	64	0	0
Production of quality animal products	4	54	0	0	0	0
Dairying	16	295	4	64	1	12
Sheep and goat rearing	8	230	1	12	0	0
Quail farming	0	0	0	0	0	0
Piggery	0	0	2	34	0	0
Rabbit farming	2	24	1	12	0	0
Poultry production	18	230	4	65	0	0
Ornamental fisheries	0	0	0	0	0	0
Composite fish culture	1	28	0	0	0	0
Freshwater prawn culture	0	0	0	0	0	0
Shrimp farming	1	13	0	0	0	0
Pearl culture	0	0	0	0	0	0
Cold water fisheries	0	0	0	0	0	0
Fish harvest and processing technology	0	0	0	0	0	0
Fry and fingerling rearing	0	0	4	126	0	0
Any other (pl.specify)	21	380	24	690	2	34
Total	290	5617	170	3984	22	347

Table 9.13 Training for Rural youth including sponsored

C-No of Courses; P-Participants



Area of Training	Rajas	sthan	Ha	ryana	Delhi		
	С	Р	С	Р	С	Р	
Productivity enhancement in field crops	36	780	30	800	1	12	
Integrated Pest Management	12	170	16	340	1	14	
Integrated Nutrient management	6	130	8	96	0	0	
Rejuvenation of old orchards	5	92	0	0	0	0	
Protected cultivation technology	8	110	4	56	0	0	
Production and use of organic inputs	3	54	1	12	0	0	
Care and maintenance of farm machinery and implements	0	0	5	72	0	0	
Gender mainstreaming through SHGs	3	60	0	0	0	0	
Formation and Management of SHGs	12	242	6	80	2	40	
Women and Child care	8	160	11	190	1	20	
Low cost and nutrient efficient diet designing	6	134	13	170	1	23	
Group Dynamics and farmers organization	0	0	0	0	0	0	
Information networking among farmers	8	98	5	86	1	18	
Capacity building for ICT application	12	263	6	80	1	16	
Management in farm animals	4	62	0	0	0	0	
Livestock feed and fodder production	3	52	0	0	0	0	
Household food security	11	198	8	156	2	36	
Any other	18	380	16	280	1	14	
Total	155	2985	129	2418	11	193	

Table 9.14 Training for extension personnel including sponsored

C-No of Courses; P-Participants



15 days training programme for fertilizer dealers - KVK, Barmer-II



Training programme for extension personnel - KVK, Barmer-II





EXTENSION ACTIVITIES

KVKs have made all concerted efforts in conducting various extension activities to create awareness and mobilize on proven and acceptable technologies and also to accelerate the technology transfer process (Table 10.1). During 2019, KVKs of Zone-II organized Advisory Services (18830), Diagnostic visits (2365), Field Day (1248), Group discussions (923), Kisan Ghosthi (1148), Film Show (1036), Self-help groups (173), Kisan Mela (1129), Exhibition (454), Scientists' visit to farmers field (5170), Plant/animal health camps (46), Farm Science Club (71), Ex-trainees Sammelan (64), Farmers' seminar/workshop (112), Method Demonstrations (1250), Celebration of important days (336), Special day celebration (186), Exposure visits (409) and others (7667) with the participation of 1184624 farmers and

22260 extension personnel, input dealers, local traders, Hon'ble MP, MLA, etc. took part. Moreover, 203819 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 KVKs. In Zone-II, all the 63 KVKs were involved in mobile advisory services. A total of 5340 text messages were delivered on various aspects of agriculture for the benefit of 8676690 farmers. Out of 63 KVKs, 25 KVKs were delivered voice messages. A total of 19776 vSMS were also sent to 88768 farmers on scientific agrotechniques.

Table	10.1	Phy	sical	achieve	ments	of	extension	activities
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Activities	Rajasthan	Haryana	Delhi
Extension activities			
No. of programmes	21300	16450	420
No. of farmers	518870	328630	6040
No. of extension personnel		6360	265
	19434		203
Total beneficiaries	538304	334990	6305
Other extension activities	128215	74300	1304
Mobile advisory services			
No. of KVKs		63	
No. of text SMS sent		5340	
No. of farmers benefited		8676690	
No. of voice messages sent		19776	
No. of farmers benefited		88768	



Extension activities organized by KVKs of Rajasthan

In the state, KVKs organized many activities like Advisory Services (9670), Diagnostic visits (935), Field Days (1020), Group discussions (560), Kisan Ghosthi (870), Film Show (834), Self -help groups (82), Kisan Mela (1034), Exhibition (248), Scientists' visit to farmers field (3250), Plant/animal health camps (32), Farm Science Club (52), Ex-trainees Sammelan (34), Farmers' seminar/workshop (82), Method Demonstrations (408), Celebration of important days (214), Special day celebration (108), Exposure visits (153) and Others (6920). 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.

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 59085 programmes were organised. The details are given in Table 10.2 and Table 10.3.

Table 10.2 Extension activities organized by KVKs of Rajasthan

Activities	No. of programmes	No. of farmers	No. of Extension Personnel	Total
Advisory Services	9670	113220	1230	124120
Diagnostic visits	935	52220	780	53935
Field Day	1020	90870	1260	93150
Group discussions	560	13890	220	14670
Kisan Ghosthi	870	40535	525	41930
Film Show	834	41226	216	42276
Self -help groups	82	2050	86	2218
Kisan Mela	1034	75106	1520	77660
Exhibition	248	180505	1325	182078
Scientists' visit to farmers field	3250	70525	820	74595
Plant/animal health camps	32	1410	28	1470
Farm Science Club	52	1421	122	1595
Ex-trainees Sammelan	34	1180	96	1310
Farmers' seminar/workshop	82	7205	520	7807
Method Demonstrations	408	19520	770	20698
Celebration of important days	214	20438	845	21497
Special day celebration	108	10500	295	10903
Exposure visits	153	9350	320	9823
Others (pl. specify)	6920	38234	3560	48714
Total	26506	789405	14538	830449



Particulars	Number	No. of KVKs
Electronic Media (CD./DVD)	35	16
Extension Literature	36568	42
News paper coverage	1850	44
Popular articles	580	36
Radio Talks	486	32
TV Talks	224	36
Animal health amps (Number of animals treated)	18520	44
Others (pl. specify)	822	42
Total	59085	292

Table 10.3 Other extension activities organized by KVKs of Rajasthan



PM Kisan Samman Nidhi Programme - KVK, Jalore

Extension activities organized by KVKs of Haryana

KVKs of Haryana state organized various extension activities viz., Advisory Services (8620), Diagnostic visits (1170), Field Day (220), Group discussions (353), Kisan Ghosthi (260), Film Show (186), Self -help groups (49), Kisan Mela (90), Exhibition (200), Scientists' visit to farmers field (1660), Plant/animal health camps (12), Farm Science Club (16), Ex-trainees Sammelan (18), Farmers' seminar/workshop (28), Method Demonstrations (820), Celebration of important days (110), Special day celebration (70), Exposure visits (248) and Others (740) through which different technologies of agricultural and allied sectors transferred to 361423 farmers and 6763 extension personnel. The details are



Animal Treatment Camp - KVK, Dungarpur

given in Table 10.4. A total of 33460 other extension activities were also performed by KVKs functioning in Haryana state (Table 10.5).



Kisan Ghosti on Okra - KVK, Ambala



Activities	No. of programmmes	No. of farmers	No. of extension personnel	Total
Advisory Services	8620	70500	240	79360
Diagnostic visits	1170	11380	219	12769
Field Day	220	8740	215	9175
Group discussions	353	8093	248	8694
Kisan Ghosthi	260	11560	310	12130
Film Show	186	10400	285	10871
Self -help groups	49	930	42	1021
Kisan Mela	90	85600	1150	86840
Exhibition	200	28820	384	29404
Scientists' visit to farmers field	1660	32620	380	34660
Plant/animal health camps	12	340	18	370
Farm Science Club	16	1120	240	1376
Ex-trainees Sammelan	18	1190	245	1453
Farmers' seminar/workshop	28	4150	520	4698
Method Demonstrations	820	17560	238	18618
Celebration of important days	110	11200	334	11644
Special day celebration	70	7080	216	7366
Exposure visits	248	9580	239	10067
Others (pl. specify)	740	40560	1240	42540
Total	14870	361423	6763	383056

Table 10.4 Extension activities organized by KVKs of Haryana

Table 10.5 Other Extension Activities organized by KVKs of Haryana

Particulars	No.	No. of KVKs
Electronic Media (CD./DVD)	210	5
Extension Literature	680	16
News paper coverage	1520	18
Popular articles	160	18
Radio Talks	54	14
TV Talks	50	16
Animal health amps (Number of animals treated)	30600	18
Others (pl. specify)	186	8
Total	33460	113



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 50 KVKs from Zone-II (35 KVKs from Rajasthan & 18 from Haryana) celebrated the technology week. Various activities have been conducted like gosthies, lectures, exhibitions, film shows, fairs, farm visits, diagnostic practicals, distribution of literatures, seeds, planting materials, bio-products, etc., during technology week. From Zone-II, 38858 farmers and farm women participated (19206 in Rajasthan and 18859 in Haryana) to get the benefits from the technology week. Details are given in table 10.6.

Extension Activities organized by KVK Delhi

The details of extension activities literature, mass media exposure organized by KVK, Delhi are as under :

Activities	No. of programmes	No. of farmers	No. of extension personnel	Total
Advisory Services	540	11040	88	11668
Diagnostic visits	260	2280	110	2650
Field Day	8	776	80	864
Group discussions	10	990	25	1025
Kisan Ghosthi	18	1740	46	1804
Film Show	16	1120	20	1156
Self -help groups	42	960	36	1038
Kisan Mela	5	4820	210	5035
Exhibition	6	4964	265	5235
Scientists' visit to farmers field	260	2240	20	2520
Plant/animal health camps	2	40	0	42
Farm Science Club	3	65	0	68
Ex-trainees Sammelan	12	870	0	882
Farmers' seminar/workshop	2	86	5	93
Method Demonstrations	22	280	4	306
Celebration of important days	12	760	24	796
Special day celebration	8	380	12	400
Exposure visits	8	160	6	174
Others (pl. specify)	7	225	8	240
Total	1241	33796	959	35996



The details of other extension activities organized by KVK Delhi are as under :

A total number of 50 technology weeks were celebrated by KVKs of Rajasthan, Haryana and Delhi The details of activities are given in table 10.6.

Particulars	No.
Electronic Media (CD./DVD)	4
Extension Literature	12
News paper coverage	34
Popular articles	6
Radio Talks	32
TV Talks	34
Animal health amps (Number of animals treated)	850
Others (pl. specify)	20
Total	992

Table 10.6 Activities conducted under technology week celebration in Rajasthan and Haryana

Type of activities	No. of activities	Number of participants
Gosthies	82	
Lectures organised	520	
Exhibition	35	
Film show	42	
Fair	18	
Farm Visit	320	
Diagnostic Practicals	48	
Distribution of Literature (No.)	280	
Distribution of Seed (q)	234.40	1130
Distribution of Planting materials (No.)	238600	12360
Bio Product distribution (Kg)	180	980
Bio Fertilizers (q)	60.00	12265
Distribution of fingerlings	50000	
Distribution of Livestock specimen (No.)		
Total number of farmers visited the technology week		70160



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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 11.1 to 11.14.

During the year 2019, KVKs of this zone produced 12961.86q seed valued at Rs. 52393811. Out of the total seed production contribution of cereals was more (8418q) followed by pulses (2356.16q), oilseeds (1799.14q), others (211.75q), spices (86.84q), fodder (68.92q), medicinal (16.5q) and millets (3.5q). The seeds produced were distributed to 26987 farmers in

respective district. The state wise crop-wise are given in Table 11.1.

Oilseeds

KVKs of this zone produced a total of 1799.94 q which valued Rs. 9650646. Among oilseeds seeds of mustard (995.06 q), soybean (412.09q), groundnut (364.57q), sesame (18.97q) and taramira (9.25q) which worth Rs. 9650646. These seeds produced were provided to 8934 farmers. The major varieties used for seed production were as GJG-19, RG559-3 and HNG-69 (groundnut), Giriraj, RH-406, RGN 298, Laxmi, RH-749, PM-26, RB-50 and Pusa Vijay (mustard), RT-127and RT-351, (sesame) JS 20-29, JS 95-60 and JS 20-34 (soyabean)RTM-314, RTM 315 (Taramira). The state wise details are given in Table 11.2

Enterprise		Rajasthan		Ha	ryana And D	elhi	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	1627.74	8365676	5728	172.20	1284970	3206	1799.94	9650646	8934	
Pulses	2276.54	16421401	6324	79.62	703600	474	2356.16	17125001	6798	
cereals	5061.64	16149580	5602	3356.61	7390007	3823	8418.25	23539587	9425	
Millets	3.50	7000	39	0.00	0	0	3.50	7000	39	
spices	86.84	821562	580	0.00	0	0	86.84	821562	580	
fodder	35.31	113674	222	33.61	643200	310	68.92	756874	532	
Medicinal	16.50	28214	60	0.00	0	0	16.50	28214	60	
Others	192.05	307327	539	19.70	157600	80	211.75	464927	619	
Total	9300.123	42214434	19094	3661.74	10179377	7893	12961.86	52393811	26987	

Table 11.1 Physical achievement of seed production



Oilseeds	Rajasthan			Har	yana and De	elhi	Total		
	Quantity (q)	Value (Rs.)	No. of farmers	Quantity (q)	Value (Rs.)	No. of farmers	Quantity (q)	Value (Rs.)	No. of farmers
Mustard	822.86	3517121	4048	172.20	1284970	3206	995.06	4802091	7254
Soybean	412.09	2396529	357	0.00	0	0	412.09	2396529	357
Ground Nut	364.57	2187420	458	0.00	0	0	364.57	2187420	458
Sesame	18.97	211055	684	0.00	0	0	18.97	211055	684
Taramira	9.25	53551	181	0.00	0	0	9.25	53551	181
Total	1627.74	8365676	5728	172.20	1284970	3206	1799.94	9650646	8934

Table 11.2 Seed production of different oilseed crops

Pulses

KVKs of this zone produced 2356.16 q pulse seeds which comprised mainly chickpea (1917.94q) greengram (297.11q), blackgram (56.98q), lentil (65.72q)mothbean (5.3q), cowpea (11.01q) and pigeonpea (9.25q). These seeds produced were made available to 8934 farmers valued Rs. 17125001. The seeds of important varieties of different pulses produced viz. blackgram (Pratap Urd-1, PU-1, MU-2 and PU-31) cowpea (RC-19, RC-101), gram (Pratap Channa-1, RSG 974, GNG-1958, GNG-2144, GNG2171, CSJ-515), green gram (IPM 02-3, IPM2-14, GAM-5, GM-6, MH-421, Virat, and RMG-975), lentil (KM 1, LL-931and RLG-5) Moth bean (RMO-257) pigeon pea (Pusa-2002). The state wise details are given in Table 11.3.

Cereals

The seeds of important varieties of different cereal crops were produced viz. barley (RD- 2715, RD- 2794, RD-2849, RD- 2552, RD-2660, RD 2786, RD- 2035, RD-2899), paddy (CSR-30, PB-1121, P.R.121, PR-114, CSR-30, PB-1509), wheat (Raj-3077, Raj 4120, Raj 4238, Raj-4037, Raj-4079, Raj-4120, Nabhi, HD-3086, HD-2967, WH-1105, Raj-3765, Raj-4083, Unnat PBW-343, DBW-221). A total of 8418.25q seeds produced were provided to 9425 farmers valued Rs. 23539587. The state wise details are given in Table 11.4.

Pulses	Rajasthan			Har	yana and De	elhi	Total		
	Quantity (q)	Value (Rs.)	No. of farmers	Quantity (q)	Value (Rs.)	No. of farmers	Quantity (q)	Value (Rs.)	No. of farmers
Chickpea	1917.94	12811182	3674	0.00	0	0	1917.94	12811182	3674
Green gram	224.21	2532767	1721	72.90	656100	435	297.11	3188867	2156
Black gram	56.98	418128	429	0.00	0	0	56.98	418128	429
Lentil	59.00	600000	330	6.72	47500	39	65.72	647500	369
Mothbean	5.30	20040	64	0.00	0	0	5.30	20040	64
Cowpea	11.01	33811	68	0.00	0	0	11.01	33811	68
Pigeon pea	2.10	5473	38	0.00	0	0	2.10	5473	38
Total	2276.54	16421401	6324	79.62	703600	474	2356.16	17125001	6798

Table 11.3 Seed production of different pulse crops



Cereals		Rajasthan		Ha	ryana and De	lhi	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	
Wheat	3426.14	12822165	3632	2216.35	3209505	1900	5642.49	16031670	5532	
Barley	1292.31	2466575	1702	0.00	0	0	1292.31	2466575	1702	
Paddy	343.19	860840	268	1140.26	4180502	1923	1483.45	5041342	2191	
Total	5061.64	16149580	5602	3356.61	7390007	3823	8418.25	23539587	9425	

Table 11.4 Seed production of different cereal crops

Spices

The seeds of important varieties of different spice crops were produced viz. coriander (RCr-48 and RKD-18), fenugreak (RMT-1, RMT-305, AFG 3), cumin (GC-4, RZ-19), Garlic (G-282, G-50). A total of 86.84q seeds produced were made available to 580farmers with value Rs. 821562. The state wise details are given in Table 11.5.

Fodder

The seeds of important varieties of different fodder crops were produced viz. Barseem (BB-2 BL-42),oat (JHO-822), Dhaman (CC-358), and Pearlmillet (JBV-3). A total of 68.92q seeds produced were provided to 532 farmers valued Rs. 756874. The state wise details are given in Table 11.6.

	G 1	a	0.11.00	
Table 11.5	Seed	production	of different	spices crops

Spices	Rajasthan			Hary	ana and	Delhi	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
Garlic	72.60	676925	118	0	0	0	72.60	676925	118
Fenugreek	8.53	43075	192	0	0	0	8.53	43075	192
Coriander	2.01	13062	176	0	0	0	2.01	13062	176
Cumin	3.25	84000	79	0	0	0	3.25	84000	79
Fennel	0.45	4500	15	0	0	0	0.45	4500	15
Total	86.84	821562	580	0	0	0	86.84	821562	580

Table 11.6 Seed production of different fodder crops

Fodder	Rajasthan			Har	yana and D	elhi	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
Oat	10.35	28850	36	0.00	0	0	10.35	28850	36
Berseem	0.30	10500	21	31.60	632000	215	31.90	642500	236
Pearlmillet	23.84	45624	124	0.00	0	0	23.84	45624	124
Dhaman	0.82	28700	41	0.00	0	0	0.82	28700	41
Mustard	0.00	0	0	2.01	11200	95	2.01	11200	95
Total	35.31	113674	222	33.61	643200	310	68.92	756874	532



Others

Besides above KVKs of Zone-II have produced 231.75 q of other seeds including millets, clusterbean, quinoa, dhanicha, and medicinal.

Planting Material Production

Production of vegetables seedlings

KVKs of this zone produced large number of vegetable seedlings (860561) viz. Bitter gourd, Bottle gourd, Brinjal, Broccoli, Cabbage, Capsicum, Cauliflower, Chilli, Drumstick, Knol khol, Longmelon, Muskmelon, Okra, Onion, Pumpkin, Ridge gourd, Round gourd, Sponge gourd, Tomato and Water melon. A total of 860561 seedlings were produced and provided to 7643 farmers (Rs. 696754). The state wise details are given in Table 11.7.

Fruits

KVKs of Rajasthan and Haryana and Delhi produced large number of fruits saplings (267430) viz. Aonla, Bael, ber, Badam,Custard apple, date palm, Fig, Guava, Jack Fruit, Jamun, Karonda, Lasoda, Lime, Mandarin, Mango, Mull berry, Orange, Papaya, Phalsa, Pomegranate and Sapota. Saplings produced were provided to 10080 farmers (Rs. 4141401). The state wise details are given in Table 11.8.

Table 11.7 Seedlings production of different vegetable crops

Vegetables	Rajasthan			Har	yana and	Delhi	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	474	3318	77	0	0	0	474	3318	77
Bottle gourd	912	6384	125	700	700	2	1612	7084	127
Brinjal	63486	108225	1255	3180	4180	37	66666	112405	1292
Broccoli	20114	26165	131	600	600	2	20714	26765	133
Cabbage	92224	55475	200	1655	2655	17	93879	58130	217
Capsicum	105	210	7	3400	6800	6	3505	7010	13
Cauliflower	16834	11326	70	3330	5830	17	20164	17156	87
Chilli	130001	141328.5	3431	1855	1605	22	131856	142933.5	3453
Drumstick	4010	58070	595	0	0	0	4010	58070	595
Knol khol	0	0	0	400	400	2	400	400	2
Longmelon	406	2842	38	0	0	0	406	2842	38
Muskmelon	248	1736	7	0	0	0	248	1736	7
Okra	279	279	7	0	0	0	279	279	7
Onion	13726	682	40	300000	10000	10	313726	10682	50
Pumpkin	364	2548	25	0	0	0	364	2548	25
Ridge gourd	655	4585	78	0	0	0	655	4585	78
Round gourd	220	1540	3	0	0	0	220	1540	3
Sponge gourd	0	0	0	700	700	2	700	700	2
Tomato	192710	223159.5	1372	7650	13150	41	200360	236309.5	1413
Water melon	323	2261	24	0	0	0	323	2261	24
Total	537091	650134	7485	323470	46620	158	860561	696754	7643



Fruits		Rajasthan	Hary	ana and I	Delhi	Total			
	Number	Value (Rs.)	No. of farmers	Number	Value (Rs.)	No. of farmers	Number	Value (Rs.)	No. of farmers
Aonla	6790	78720	109	0	0	0	6790	78720	109
Bael	177	4820	35	0	0	0	177	4820	35
Ber	22657	627335	283	0	0	0	22657	627335	283
Custard apple	5815	200820	329	0	0	0	5815	200820	329
Date palm	16	4800	6	0	0	0	16	4800	6
Fig	9	370	5	0	0	0	9	370	5
Guava	5240	151235	520	100	2500	50	5340	153735	570
Jack Fruit	2738	54760	802	0	0	0	2738	54760	802
Jamun	3191	50270	980	0	0	0	3191	50270	980
Karonda	4948	94960	128	0	0	0	4948	94960	128
Lasoda	3247	93675	109	0	0	0	3247	93675	109
Lemon	20406	383987	1650	358	11240	244	20764	395227	1894
Mandarin	9704	382665	306	400	12000	50	10104	394665	356
Mango	11170	412665	821	51	5100	8	11221	417765	829
Mull berry	60	1200	2	0	0	0	60	1200	2
Orange	122	7850	52	0	0	0	122	7850	52
Papaya	161445	1449959	3171	500	5000	5	161945	1454959	3176
Phalsa	74	1600	21	0	0	0	74	1600	21
Pomegranate	8005	90780	317	0	0	0	8005	90780	317
Sapota	207	13090	77	0	0	0	207	13090	77
Total	266021	4105561	9723	1409	35840	357	267430	4141401	10080

Table 11.8 Saplings production of different fruits crops

Ornamental (Flower) crops

Large numbers of saplings of ornamental crops produced by KVKs of this zone (35544) during the year were provided to 2444 farmers (Rs. 543749). The state wise details of crops, number of saplings, value and procured by farmers are given in Table 11.9.

Fodder crops

Majority of KVKs produced Napier grass (Co-4) variety and the details are given in Table 11.10.

Forest crops

Plants of different forest crops produced by KVKs of Rajasthan and Haryana and Delhi (6313) during the year (2019) were provided to 1551 farmers (Rs. 90808).

The state wise details of crops, number of plants, value and procurement by farmers are given in table 11.11.





Ornamental		Rajasthan		Har	yana and	Delhi	Total		
	Number	Value (Rs.)	No. of farmers	Number	Value (Rs.)	No. of farmers	Number	Value (Rs.)	No. of farmers
Agave	2151	170	8	0	0	0	2151	170	8
Ashok	412	37415	26	0	0	0	412	37415	26
Boganviliya	294	8865	31	0	0	0	294	8865	31
Bottle palm	110	6520	19	0	0	0	110	6520	19
Champa	2801	52937	411	0	0	0	2801	52937	411
Chandani	104	2600	8	0	0	0	104	2600	8
Croton	421	842	30	0	0	0	421	842	30
Duranta	239	4780	51	0	0	0	239	4780	51
Exora	84	5040	7	0	0	0	84	5040	7
Ficus	164	7720	19	0	0	0	164	7720	19
Gulmohar	50	1000	21	0	0	0	50	1000	21
Gudhal	244	2880	62	0	0	0	244	2880	62
Har-Shringar	113	2260	51	0	0	0	113	2260	51
Kaner	982	14620	47	0	0	0	982	14620	47
Kewda	1	30	1	0	0	0	1	30	1
Mehandi	387	3870	15	0	0	0	387	3870	15
Marigold	825	2675	81	1000	500	10	1825	3175	91
Mogra	130	2600	34	0	0	0	130	2600	34
Ratrani	79	1580	6	0	0	0	79	1580	6
Rose	19850	132,785	1080	0	0	0	19850	132785	1080
Tager	5100	252000	419	0	0	0	5100	252000	419
Tikoma	3	60	3	0	0	0	3	60	3
Total	34544	543249	2430	1000	500	10	35544	543749	2440

Table 11.9 Sapling production of different ornamental crops

Table 11.10 Planting material production of different fodder crop

Fodder	Rajasthan			Haryana and Delhi			Total		
	Number	Value (Rs.)	No. of farmers	Number	Value (Rs.)	No. of farmers	Number	Value (Rs.)	No. of farmers
Napier	76380	272285	123	1000	2000	5	77380	274285	128
Guinea	190	9500	5	0	0	0	190	9500	5
Total	76570	281785	128	1000	2000	5	77570	283785	133



Forest	Rajasthan			Har	yana and	Delhi	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
Amaltas	20	400	10	0	0	0	20	400	10
Ardu	335	4700	215	0	0	0	335	4700	215
Bargad	19	380	5	0	0	0	19	380	5
Karanj	566	6370	296	0	0	0	566	6370	296
Khejadi	441	7758	237	0	0	0	441	7758	237
Neem	2020	41800	688	0	0	0	2020	41800	688
Peepal	28	560	10	0	0	0	28	560	10
Sagon	1089	10890	48	0	0	0	1089	10890	48
Poplar	0	0	0	1475	12550	5	1475	12550	5
Shisham	320	5400	37	0	0	0	320	5400	37
Total	4838	78258	1546	1475	12550	5	6313	90808	1551

Table 11.11 Saplings production of different forest crops

Medicinal crops

Saplings of different medicinal crops produced by KVKs of this zone (6547) during the year were made available to 508 farmers (Rs. 57145). 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 11.12.

Production of Bio-products

In this zone, 26 KVKs produced a total of 182833.4kg of bio-products of Rs. 3229993 and same were distributed amongst 7714 farmers. Time to time, it

included mainly bio-agents viz. Trichoderma (5683 kg) and vermiculture (7595.95) and Waste Decomposer (5186). Beside this KVKs also produced bio-fertilizers viz. Azolla (2171.02 kg), Azotobactor(104.8 kg), Rhizobium (178kg), PSB (280.6 kg) Vermicompost (161664 kg).The details of zone are given in Table 11.13.

Livestock production

KVKs of Rajasthan and Haryana and Delhi produced 21538 goat bucks, goat doe, sheep rams, poultry chicks, poultry cocks, poultry hens, and poultry

Medicinal	cinal Rajasthan			Har	yana and	Delhi	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
Aritha	8	160	4	0	0	0	8	160	4
Aloe vera	5822	48295	451	0	0	0	5822	48295	451
Har singar	145	2900	29	0	0	0	145	2900	29
Tulsi	572	5790	24	0	0	0	572	5790	24
Total	6547	57145	508	0	0	0	6547	57145	508

Table 11.12 Saplings production of different medicinal crops



Bio Products	Name of the bio-product	Quantity Kg	Value (Rs.)	No. of Farmers
Bioagent	Trichoderma	5683	789400	1215
	Vermiculture	7595.95	891102	2230
	Waste Decomposer	5186	103720	272
	Total	18464.95	1784222	3717
Bio-fertilizer	Azolla	2171.02	129370	387
	Azotobactor	104.8	10480	415
	Rhizobium	178	17800	445
	PSB	280.6	35075	650
	Vermi compost	161634	1253046	2100
	Total	164368.4	1445771	3997
	Grand Total	182833.4	3229993	7714

Table 11.13 Bio-products produced by KVKs

eggs, poultry duck, pigs and rabbits of improved breeds.Besides of these KVKs produced 780000 fishes of IMC and ornamental. A total of 1826 farmers procured from KVKs during 2019. The details of zone are given in Table 11.14.

Particulars of Live stock	Name of the breed	Number	Value (Rs.)	No. of Farmers
Goat				
Buck	Sirohi	136	389900	41
Doe	Sirohi	152	1014379	75
Sheep				
Ram	Chokhla, Kendrapada	18	48000	14
Poultry				
Poultry Chicks	Kurolier Kadaknath	5899	666200	447
Poultry Eggs	Pratapdhan, kurolier, Kadaknath	1677	13509	171
Poultry Hen	Pratapdhan, kurolier Kadaknath, Chhabro	12612	921285	975
Duck	-	6	2100	1
Pig				
Pig	Large white yorkshire	1019	102510	87
Rabbit				
Rabbit	Newzeland giant	19	6200	8
Total		21538	3164083	1819
Fishery	IMC, Koi, Moli	780000	150000	7

Table 11.14 Production of livestock materials



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SUCCESS STORIES

1. Integrated Farming System A gateway of success for Farm woman

Name	:	Amarjeet Kaur
Address	:	Village Adhoyi, Block Barara, District Ambala (Haryana)
Mob. No.	:	7015876379
Age	:	32 years
Education	:	Graduation
Landholding	:	8.5 acres
Farming Exp.	:	13 years
Cropping Pattern	:	 Rice-Wheat-Moong Sugarcane+Onion-Ratoon Potato-Onion-Fodder Livestock : 2 Buffaloes

Use of Modern Machinery & Agri. Implements

		Submersible Tube well, TractorM.B. Plough, Disc Harrow (KVK)Happy Seeder, DSR (KVK)
Social Media	:	Website https://www.facebook.com/amarjitkaur.adho You tube channel: lady farmer Amariit kaur [Adhoi]
Awards	:	Village, Block & District level

Description

Miss Amarjeet Kaur is a well-known woman farmer in Adhoyi village of Ambala district in Haryana and agriculture is the mainstay of her income to fulfil the basic requirement of her family. With the paralytic attack of her father in 2007, she has rendered all her day to agriculture farming by growing different crops on 8.5 acres of land and getting milk from dairy animals. Before coming in contact with Extension functionaries of Agriculture Department and KVK, she was unable to get higher crop production. She is active, sincere and hard working woman and never thought that her involvement in agriculture work could transform her life.

Training & Technical support from KVK:

• Miss Amarjeet Kaur got trainings and advisory services from KVK team and personnel from Agriculture department

- KVK supported her by providing technical know-how regarding RCT, Soil Testing, improved variety of seeds viz; Wheat, Chickpea, Mungbean, Mustard and invited her to participate in the trainings, WhatsApp groups, Krishak gosthis, Field visits, Exposure visits, Kisan Melas etc. on regular intervals.
- During last two years with technical guidance of KVK, she switched over to organic farming acting as a Role Model to other women farmers.

Achievements

- She has started seeds of improved varieties and seed treatment followed by bio-fertilizers and resource conservation technologies for getting high returns and reduced cost of cultivation
- Success in Integrated farming system with milk from dairy animals, Use of Vermi-compost, Vermi



wash in Crop production, Bamboo staking in cucurbit crops and growing of high yielding fodder varieties

- Cultivation of organic rice, wheat and vegetable crops also attribute to her success
- Keeping in view of water scarcity she shifted over to Maize cultivation in replace of rice crop in some area

Economics

Engaged in agriculture and allied activities, she earned a net income of Rs. 6,70,000/-/annum

Crop /Enterprise	Area (Acre)	Yield (qtl.)	Input Cost (Rs.)	Gross Return (Rs.)	Net Return (Rs.)
Wheat	5 acre	110	10,000	2,14,500	1,74,500
Rice		140	8,000	2,38,000	1,88,000
Sugarcane	3 acre	1050	30,000	3,57,000	2,67,000
Onion	0.5 acre	41.2	27,350	49,200	22,850
Potato	0.5 acre	50.5	10,000	20,200	10,200
Fodder (Chari)	0.5 acre	75.0	6,000	18,750	12,750
Milk Production	2 Buffaloes	1350 liter	47,000	54,000	7,000
Total					6,70,000

Now started organic farming (Wheat, Rice & vegetables)

Awards & Recognition in District:

- She is known as a progressive farm woman & Master Trainer for farmers in the district
- Department used her competence to train other fellow farmers
- She received Awards at district level by Hon'ble Ministers, Hon'ble MLA (Ambala City) Sh. Aseem

Goel, Agriculture Department, Krishi Vigyan Kendra, Ambala, Rotary Club and Prayas Sewa Sanasthan, Barara etc.

In view of changing climatic scenario and excess use of chemical fertilizers and pesticides in crops, she has shifted to her farming into organic farming from two years back with technical know-how from KVK team under Parampragat Krishi Vikas Yojna of Govt. schemes and acting as Role Model for other farmers and farm women in Ambala district.



Field preparation for Paddy nursery raising





2. Supplementary source of Income through Goat Farming

Farmers' Name	:	Sh. Amar Singh
Age	:	55
Address	:	Village - Penghore Saman, Post - Panghore Khan Tehsil - Kumher, District - Bharatpur, State - Rajasthan
Education	:	10th
Landholding (ha/acre)	:	Rainfed - 1.5 hac
Details about livestock (no.)	:	100
Farming experience (Years)	:	10

Sh. Amar Singh is an innovative and progressive farmer of Penghore Saman village in Bharatpur district. He is 55 years old farmer and educated upto 10th.

Description of Innovation: In Penghore Saman village most of the farmers depend on rain water for irrigation. Farmers grow rainfed mustard, wheat and barley. Nobody was rearing livestock on commercial level. Sh. Amar Singh came at Krishi Vigyan Kendra, Baharatpur in 2018. After completion of the training programme, he decided to start his own Barbari breed based goat farm. He made up a permanent structure at Penghore Saman. Scientist of KVK visited to Amar Singh farm and found the farm set-up satisfactory with some modifications in housing, storage of feed-fodder and sanitation etc.

Mr Amar Singh also showed great enthusiasm in learning and acquiring skills of goat farming, adopted improved management practices and technologies such as breeding calendar, vaccination and deworming schedule, strategic intensive feeding, chaffed green fodder and reserving quality male for breeding. He purchased 15 Barbari breed of goats from surrounding villages of Mathura and pure 10 females from CIRG, Mathura in 2018. At present Sh Amar Singh has 50 adult females, 4 castrated male 3 breeding males and 45 kids and all are being maintained under intensive stall feeding. He offers Chhana(gram), guar bhoosa, Loong @ 500 gram/kid and 750-1000 gm/day adult and mineral mixture for adults along with concentrate mixture (250-400 gm/day to growing kids and 500 gm /day to lactating, pregnant and bucks. He provides 600-750 grms concentrate to castrated males prior to 3 months of Eid. He also performs vaccination against PPR and ET and started Targeted selective treatment

strategy against parasitic diseases. Proper application of preventive health measures are followed which resulted mortality at his farm in 2018-19 was just 1.5%.

Economics of Innovation: The average body weight of buck ranges from 30-38 kg at one year and that of the female from 22-28 kg. The body weight of castrated male at about one and a half year of age was 46 to 55 kg. The cost of production per goat per year was Rs. 7000-7200. He has sold his 9 adult bucks @ of Rs. 14000 to 18000 whereas castrated males were sold @ Rs. 15,000-25,000/- male. He is not selling females because he is in the process to increase adult females at his farm upto100.

Sh. Amar Singh has also initiated to support villagers for goat farming and ensured to supply pure Barbari male and females to them. Sh. Amar Singh is very happy and leading a peaceful and busy life with his goats. He is very enthusiastic and looking forward to maintain his goat to present numbers and to sale his goats at regular interval to uplift his economic condition. This important enterprise is helpful in Doubling Farmer Income on sustainable basis.





3. Cultivation of vegetables changed economical condition

Farmers' Name	:	Sh. Mahesh Chand
Age	:	36
Address	:	Village - Sitara, Post - Pala, Tehsil - Kumher District - Bharatpur, State - Rajasthan
Mobile No.	:	8502017809
Education	:	8th
Landholding (ha/acre)	:	Irrigated - 2
Details about livestock (no.)	:	Three buffaloes. One calves
Farming experience (Years)	:	10



Description of Practice: Shri Mahesh chand is an innovative and progressive farmer of Sitara village in Bharatpur district. He is 36 years old farmers and passed 8th class education.

Description of Innovation: In Sitara village most of the farmers depends on rains water for irrigation. Farmers grow rain fed mustard, wheat and barley till 2013 none was growing vegetables as village became of lack of irrigation water but recharging of tube well under NICRA programme. Some farmers started growing vegetables. Mahesh chand is one of the farmer growing of vegetables around the year. He has good farm house, animal shed, compost unit. He is also having small shed net house built under NICRA programme. He is growing seedlings in Net House for off season vegetable production.

Practical Utility of Innovation: He has adopted improved practices for commercial vegetable production, specially Cauliflower, Radish, Carrot & Tomato and Potato by using proper crop rotation. with



the help of KVK Scientists using high yielding varieties, Integrated pest management(IPM) and Integrated Nutrient Management(INM) Practices in vegetable crop production were used in 0.2 ha land in one year.

Cauliflower - 15 tonnes

Raddish - 8 tonnes

Economics of Innovation: He has developed marketing linkages with vegetable Mandi of Deeg block. Due to attractive size, colour and good quality vegetables, he got very good selling price i.e.

Cauliflower

15 tonnes: $15000 \text{ kg} \times \text{Rs} 10 = \text{Rs} 150000.00$

Raddish

8 tonnes $8000 \text{Kg} \times 15 = \text{Rs} \ 120000.00$

Total expenditure - Rs 40000 for Seed, Labour, irrigation, IPM, INM, Transportation

Net profit - Rs 230000.





4. Backyard Poultry provides Livelihood security

Thematic Area	:	Poultry
Profile of Innovator	:	Shri Shoraj Meena
Address	:	Village - Ramgarh, Gram Panchayat - Rawat Khera Tehsil - Jahahpur, District- Bhilwara-311201, Rajasthan
Education of Rural Youth	:	B.A., B.Ed.
Mobile No.	:	9587644918



Situation Analysis: The major constraints of backyard poultry are low production potential and lack of improved breed, which can thrive and survive well in backyard/ free range conditions without expensive inputs like feed and disease management etc. which in turn can contribute substantially to raise the overall per capita availability of egg and meat for nutritional security as well as employment to rural women or youth for their livelihood security in rural and tribal dominating areas. Another major constraint is accessibility of improved germplasm at door step. Poultry feed cost is very high in present scenario and low egg production in local birds. It is costly to medicine to maintain health status of poultry. Bhilwara city is well known as textile city due to mostly labour or village poor migration in textile industries. Hence, KVK motivated rural youth and farmers for adoption of improved breed of poultry for self-employment and reduction of migration towards city.

Technology, Implementation and Support: Keeping these facts in mind KVK, Bhilwara-I demonstrated dual type poultry breed PRATAPDHAN which has been developed at MPUAT, Udaipur under AICRP on Poultry Breeding as per the demand of the poultry keepers of Rajasthan. The Pratapdhan has genetic constitutions as 25% native, 25% CSFL and 50% RIR and specific features like multicolour plumage, survive on low input/ no input or free range condition, produce brown shell egg, broody characters, longer shank length, resistance to tropical diseases, adaptability to harsh climatic conditions.

Outcome of the Pratapdhan: The impact in terms of productivity, income and nutritional study were conducted in Bhilwara District. The brief results are as follows.

Productivity Enhancement

The above results indicate that the body weight of Pratapdhan birds under field conditions is higher by

Traits		Br	%		
		Deshi	Pratapdhan	higher	
Body Weight at 20 wks (kg)	Male	1.3	1.9	46.15	
	Female	1.0	1.7	70	
	Pooled	1.1	1.8	63.63	
Body Weight at 40 wks (kg)	Male	1.8	2.4	33.33	
	Female	1.4	2.0	43	
	Pooled	1.6	2.2	37.5	
Average age at sexual maturity (Days)		182	158	13	
Annual egg production		44	149	238.63	

Table 1 Comparative performance of Deshi and Pratapdhan breeds under field conditions



46-70% at 20 wks and 33-43% at 40 wks than the deshi fowl. Similarly, the egg production of Pratapdhan is 238.63% higher than the native fowl maintained by the farmers in village. The age at sexual maturity of Pratapdhan is 13% lower than deshi.

Uptake, Spread and Benefit:

1. Income Enhancement: Traditionally farmers rear birds under backyard system with zero inputs with only 10-20 native/ deshi birds. A mere shift from native to improved germplasm has led to a quantum increase in the returns for the farmers with same rearing practices.

Looking to the better performance and profitability of the Pratpdhan birds there is a huge demand of this breed. Farmers are now gradually increasing the flock size, paying attention on housing and feeding of birds and poultry rearing contributing substantially subsidiary income. The economics of rearing a unit of 20 chicks was calculated as per information provided by farmers considering cost of chick Rs 65/ chick, mortality 10%, sale price of meat and egg Rs 200/ kg live weight and Rs 10/ egg.

Table 2 Economic comparison between Deshi and Pratapdhan breed in the field (a unit of 20 chicks)

Income (Rs.) from sale of	Deshi	Pratapdhan
Males	2360	3290
Eggs	3880	13260
Female	2630	3800
Total	8870	20350
Net profit/ unit (Rs)	7570	19050
Net profit over deshi/ unit		11480

The farmer earns an average annual net profit of Rs. 20350 by keeping a unit of 20 Pratapdhan birds which is Rs. 11480/- more than by keeping native non-descript birds.

2. Nutritional Improvement: The Backyard Poultry Farming plays a significant role in the rural people's life, which alleviates protein malnutrition of women, feeding mothers, children and sick. As per survey, farmers consume 149 eggs, 3.33 birds/ year/ family when they raised native chicken.

Feedback from farmers:

- Selling of egg is good due to brown colure
- Egg yolk is higher as compared to Deshi (Approximate double)
- > No disease problem
- ➢ Egg size is higher as compare to Deshi
- Fast Spread of poultry rearing in neighbouring, relative and surrounding areas due to fast growth and daily source of income.





5. Sustainable Income Generation through Integrated Farming System in Tribal village

Situation analysis: The Jahajpur Panchayat Samiti is considered as tribal belt of Bhilwara district. In addition to poor economic status, farmers are having lack of knowledge in improved agriculture technology, improved breeding and feeding management of animals and rearing of local poultry breed. After purposefully selection of cluster comprises of Rawatkhera & Ramgarh in Jahajpur Panchayat Samiti under TSP activities, Ice-breaking activities were conducted to get feedback from tribals and their priorities for best utilization of the available resources for income augmentation, livelihood security and improvement in nutritional status of tribal farmers.

Technology, implementation and support: After receiving the feedback, KVK Bhilwara started capacity building programme of the farmers by conducting On and Off campus training programmes, field visits, conductance of CFLDs, organization of field days, animal health camp, night gosthi, farm advisory services etc. The efforts of KVK in popularizing of the new varieties of wheat (Raj 4079), Mustard (RH 406), Gram GNG 1581, Barley (RD 2786) by seed production programme under CFLDs as well as breed improvement programme in Cow and Goat through Gir bull and Sirohi buck have been initiated. The KVK also

introduced improved breed of poultry (Pratapdhan & Kadaknath). To increase milk yield, nutritional status and improve growth and egg production through demonstration of Azolla (25 per cent). Further to maintain the soil health and improvement in fertility status demonstrations of vermicompost, vermiwash and waste decomposer were also laid out. The income has rapidly increase by the quail demonstration in the TSP area.

Uptake Spread and Benefits: The produce of the CFLDs (25 per cent) were used as the seed which was stored in storage bins provided by the KVK. Timely fumigation was done at the time of storage of the seed to overcome the rodent and mites. The farming community started to use improved variety seed and seed replacement rate of cereals oilseeds & pulses was reached to 27.80 percent within span of three years.150 tribal farmers have been covered by providing 20 chicks to each. Considering 10 percent mortality farmers are getting on an average egg production 156 eggs per bird per year totaling to (150X156X16) 3,74,400 eggs per year. They have consumed two male birds. By selling of 3,70,000 eggs @ Rs. 8/- per egg they have obtained Rs. 29,60,000/-per year and generated revenue 28,10,000/- after deducting the







expenditure of Rs. 1,50,000/- by all farm families in the village. The net additional income generated per demonstration is Rs. 18,733/- per year. By the use of Azolla the milk production (6% - 8%) as well as fat content also increased resulting in their income generation and nutritional security. Breeding efficiency



in dairy animals was also improved. By the use of vermicompost in their field they are not only improving the fertility status of the soil but also reducing the input cost of fertilizer. The farmers are very much satisfied with the improved package of practices and adoption of the integrated farming system.





6. Cultivation of Kharif Onion is one of the suitable way for enhancement of income in Arid Zone of Rajasthan

Name	:	Mr. Surendra Kumar
Age	:	35 years
Phone	:	7357370988
Education	:	12th
Address	:	Village - Bedwa, Tehsil - Didwana District- Nagaur (Rajasthan)
Land holdings	:	8 ha
Livestock	:	Cow and Buffalo
Farming experience	:	15 years



Situation analysis/Problem statement: Onion is one of the most important bulbs as well as cash vegetable crop. It is one of the few versatile vegetable crops that can be kept for a fairly long period and can safely withstand the hazards of rough handling including long distance transport. Most of the farmers prefer local cultivar for sowing in their field during rabi season in order to get good returns during winter. Onion production is not always profitable for farmers owing to certain risks associated with it. The production seasons and arrivals of onion in India lead to a typical situation where in the prices tend to peak during September to November and reduces from January to March-April every year. Generally the onion storage filled by rabi onion gets emptied by around August to September beyond which storage loss is also high. In Nagaur, production of onion in Kharif season is a new strategy to have continuous supply of onion round the year and thus to minimize dependency on supply of onion from other States.

Plan, Implement and Support:

- Krishi Vigyan Kendra, Maulasar, Nagaur-II introduce kharif onion variety Agrifound Dark Red (AFDR) in the village Bedwa through organization of demonstration during 2018-19 and 2019-20 on farmers fields.
- Demonstrations of onion were carried out during kharif season on farmers fields in two adopted

villages viz., Bedwa and Alakhpura. One improved variety (AFDR) along with one local variety (Rasidpura selection) were evaluated. All the recommended package of practices were adopted for successful cultivation of crop. KVK scientists were facilitated in performing the field operations like nursery sowing, manuring, spraying, weeding, harvesting, curing, grading, packing, marketing etc, during the course of training and field visits.

• The literature and technical support in terms of advisories, trainings, farmer and scientist interactions, field days were organized to showcase the technologies to the neighbouring farmers for its large scale adoption.

Output: Mr. Surendra Kumar from village Bedwa is one of progressive farmer. He interacted with scientists of Krishi Vigyan Kendra and after knowing the benefits of kharif onion variety var. AFDR (Bulb are dark Red in colour, globular in shape with tight skin, moderately pungent and better storage performance). He cultivated kharif onion during May, 2018 in an area of 0.3 hectare. He observed complete germination and good plant population. He expressed that the crop was very vigorous and farmers of the village used to visit his field to observe growth of onion. He harvested 99.00 quintals of good quality bulbs. In next year he purchased seed for one ha and taken crop in one hectare.



Year	Season	Crop	Area (ha)	Yield (q/ha)	Cost of cultivation (Rs./ha)	Gross return (Rs./ha)	Net return (Rs./ha)	B:C Ratio
2018	Kharif	Onion	0.3	297.00	97500.00	230400.00	132900.00	2.36
2019	Kharif	Onion	1.0	230.00	98000.00	930000.00	832000.00	9.48

Table 1 Economic performance of onion production

*Selling price of onion was 775.00 and 4000.00 Rs./q in 2018 and 2019, respectively

1. Outcome:

• The technology reaped tremendous growth resulting in sustainable income for the farming community which has resulted good yield and better profit.

2. Impact

• The adoption of kharif onion through intervention of Krishi Vigyan Kendra, Maulasar, Nagaur-II



A view of field day on onion demonstration

enhanced productivity leading to sustainable annual income.

• Helped in the dissemination of technology in and around the villages of Bedwa covering more than 50 ha of land under kharif onion where earlier farmers grew only rabi onion. The spread of variety (AFDR) from farmer to farmer has gained momentum annually.



A view of harvested onion



7. Meenakshi Dhakad Becomes self-sufficient through Apiary

Currently approximately 3 lakh farmers in India are employed through beekeeping therefore, beekeeping is a profitable source of employment for the rural unemployed. Apiculture is also providing good source of income for the landless farmers as, beekeeping is migratory in nature. Few days ahead of international women's day, there is another example of narrowing gender power gap. Meenakshi Dhakad as a rural background of Anta becomes first woman apiarist in the Baran district.

Meenakshi Dhakad is born at Rooppura village on 6.09.1992 near to Anta in Baran district. She studied post graduate degree programme in M. Com and interested to develop bee keeping unit. She was married to Krishan Kumar Dhakad in Neemach district of Madhay Pradesh and is jointly doing the entrepreneur successfully.

In September 2019, Meenakshi left job a Visa counsellor in New Delhi and contacted with KVK Scientist in October 2018. She was motivated by KVK Scientist to take up apiculture training, after motivation she participated in one-month long training course on Bee Keeping from Krishi Vigyan Kendra, Anta-Baran conducted under Skill Development Programme during 26th Nov. 2018 to 24th Dec. 2018.

After completion of this training, she successfully started with 70 man-made hive bee



Training certificate by KVK Scientist

colonies in Simali village near to Baran. Currently she has 70 boxes of honey bees, each of which has around 25000 to 30000 bees. These boxes are taken from one place to another place according to geographical, climatic and seasonal conditions that suit bees. These wooden boxes contain 10



wooden frames with artificial computerised wax sheet which work as artificial honeycomb for bees, where worker bees work to extract nectar and make honey from bees.

Migration Cycle: Honeybee requires food continuously throughout the year that requires the flora for the feeding. Therefore, honeybee colonies must migrate where the sufficient flora are available. She migrates the honeybee colonies from Baran to Guna to Anta to Kota to Neemuch for producing honey and survival of bees on mustard, coriander, babool, berseem, til, cucurbits respectively.

Migration cycle



During honey dearth period artificial food is given for bees include sugar syrup, candy and pollen substitute according to the rise and fall the cycle.



Experience of Meenakshi in Apiary: Initially she was afraid to put her hand inside the boxes and tend bees, however, with time, it become fun. When she was stung for the 20th time, she stopped feeling the hurt. Now she takes care of bees, clean their honey combs every week after taking out the honey nectar, take the boxes from places to places according to the cycle, Meenakshi said.

Output: During honey flow period, each box produces around 4-5 kg of honey. From 70 boxes, total 350-kilogram honey is produced every week. This honey is put to value added chain where it is used to produce 5

to 6 products sold under brand names. Dirghaya Bhava through online and WhatsApp groups. The cost and production of honeybee colonies are depicted in table 1. She developed the new innovation of manual processing of honey for selling in market. Meenakshi's message to women in village is that never be afraid to pursue dreams and keep honing skills. "One day they will take you very far" She remarked. She collected 2520 kg honey and obtained net return of 314750.00. Other farmers (farm women) of village have assured to take up this enterprise by formation of groups (SHG).





8. integrated farming a way of income generation round the year

Thematic area	:	Integrated farming System
Name	:	Sh. Ravta Ram Choudhary
Address	:	Village - Maga ki Dhani, Kharva, Post - Bhkharpura Tehsil - Gudamalani, Dist. Barmer (Raj.)
Mobile No.	:	9982514811
Age	:	33 years
Education	:	10th Pass
Land Holding	:	10 ha



Problem/challenge addressed: The average rainfall of the Barmer is 277 mm and the soil is sandy to sandy loam types with high pH. Erratic rainfall with long dry spell is not able to support the cultivation of many crops which are requiring assured irrigation. Traditional cultivation of crop is not sufficient for sustainable livelihood of the villages. Hence, establishment of IFS can meet the demand of families with full employment and higher farm income security.

Description of innovative practices/technology: Integrated farming system (Field crops (04 ha)+Diversified 4.0 ha in orchards (Ber, Pomegranate, Datepalm, Sapota) with drip irrigation and solar system + Vegetables cultivation (1.0 ha)+ Dairying + Farm pond + Fodder crop (0.5 ha)+Vermicomposting).

Practical utility: The innovations of location specific integrated farming system (Field crops+orchards+ Vegetable cultivation) integration with dairy farming, vermicomposting, Commercial farming and Solar unit

gives good remunerations has proved the way to show the potentiality of system.

Economics/Profitability of innovative practice/ technology: During 2016-17, net income from traditional cultivation of crops, vegetables and dairy farming was Rs. 5-7 lacs only which has been increased Rs. upto 20-25 lacs due to establishment of Integrated Farming System model (Field crops+ Orchards+Vegetable cultivation + dairy farming +Vermicomposting).

Potential: Acceptance level, horizontal spread of innovation and number of farmer adoptingDue to the concerted efforts of Sh. Ravta Ram, nearly 35-47 farmers of nearby villages adopted integrated farming system module (IFS) and started production. More than 15 groups of Intra, inter district and progressive farmers, officials, public leaders, trainers and trainees visited to see model of Integrated Farming System.






9. Diversified farming system improved livelihood of Thar farmer

Thematic area	:	Integrated Farming System
Name	:	Sh. Narpat Singh
Address	:	Khakhi - Padru (Barmer)
Mobile No.	:	9460840756
Education	:	10th std.



Problem: The average rainfall of the district 277mm with minimum and maximum Temp. of the district 4.0 to 49.8 C and the soil is sandy to sandy loamtype with high pH and EC. Erractic rainfall with long dry spell are major causes for low production of crops.

Description of Innovative technology: Mr. Narpat Singh achieved success in developing IFS model in his 30 ha area of land at Khakhi – Padru (Barmer). He started the Agriventure in 2011. The layout of IFS is such that the area under field crop is 4.0 ha, Pomegranate in 20 ha, other fruit plant in 1.0 ha, vegetable is 1.0 ha, water pond and dairy 1.5 ha and fodder crop 0.5 ha, The main crop is Pomegranate. Adoption of modern technology, immunization of animals and use of bio-pesticide, etc. Precisely from the 28.0 ha of land he can earn the annual profit of Rs. 80-100 lakhs. Mr. Narpat Singh has employed Six-Seven permanent persons on the farm. He was honoured by many institutes, Govt. Departments, District Collector etc.

Practical utility: Acceptance level, horizontal spread of innovation and number of farmer adopting. The farmers of village realized the importance of IFS. Many groups of intra, inter district, officials, public leaders, trainers and trainees visited to see model of Integrated Farming System.

S. No.	Enterprise	Av. Income/year (in lakhs)
1	Horticulture (Pomegranate) (20.00 ha)	80-85.00
2	Field Crops (4.00 ha)	3-4.00
3	Dairying	3-4.00
4	Vegetable (1.00 ha)	1-1.25

Economics





10. Enhancement of Productivity though Integrated Crop Management in Chickpea

Boost in Production of Chickpea	Through Integrated	Crop Management
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Name of Farmer	:	Mr. Surendar Kumar
Fathers Name	:	Shri Ram Singh
Age	:	30 Yrs
Education	:	(10+2)
Address	:	Village - Lacharsar, Ratangarh
Season	:	(Rabi 2018-19)



Introduction: Mr. Surendar Kumar s/o Mr. Ram Singh is the resident of village Lacharsar, Tehsil: Ratangarh, Churu. His main occupation is agriculture with 20.0 ha of land with limited irrigation facilities. He belongs to a large family and due to limited resources and lack of technical knowledge about improved crop production technology; he was unable to generate sufficient income for his family welfare by farming. Due to poor economic condition less use of agri-inputs and poor fertility of soil resulted in low production of crops.

During a training programme, he came in contact with KVK scientists and based on technical know-how he applied all technological packages in an integrated manner and used improved variety of Chickpea (GNG -1581) by following the integrated crop management practices. He also followed and applied some other cultural practices such as line sowing, intercultural operation, and plant protection measures. These interventions helped him to improve the soil fertility and productivity. The variety performed very well as compared to existing seed material. He got a marked production of chickpea than average production of district.

KVK intervention

 Provided improved seed of Chickpea variety GNG-1581

- Seed treatment with Carbendazim 2 g/kg seed and bio-fertilizer
- Training and regular field visit

Critical input provided by KVK: Seed & Soil treatment with fungicides, bio-fertilizer and Trichoderma

Out Put: The variety (GNG-1581) performed the best with two irrigations.

Impact: Mr. Surendar Singh provided seed material of the variety (GNG-1581) to 9 farmers of his village and also demonstrated the multiplication method of Trichoderma with FYM for soil treatment which is quite effective in management of root rot in chickpea.



0	utcomo	
U	utcome	

Сгор	Variety	Area	Yield (q/ha)		Area Yield (q/ha) Incr		Increase in yield	B:C Ratio
		(ha)	Demo	Local check	(%)			
Chickpea	GNG-1581	1	13.34	9.83	35.70	2.33		



11. Para-Technician source of an addition income

Name of farmer	:	Sh. Prabhu Dayal Swami
Fathers Name	:	Sh. Dalip Kumar Swami
Age	:	24
Village	:	Jeevandesar, Sardarshahar
Cropping system	:	Irrigated



Introduction: Mr. Prabhu Dayal Swami is a resident of village Jeevandesar, Sardarshahar of Churu district. He was doing labour work at farmers field on daily wages. He is a marginal farmer and having only 2.0-acre agriculture land (rainfed) in the village. He was in search to increase his income through allied enterprises than agriculture. Meanwhile, he came to know that KVK, Sardarshahar is providing one-month Para-Technician training and he had joined it and acquired the skills of availability of spare parts of sprinkler, mini sprinkler, drip irrigation, plant protection equipment, farm implements and machinery during the course of training programme.

He acquired practical skill in repair and maintenance of farm implements through this onemonth training course. As a result of intervention like training and advisory services, he started to purchase tools for repairing sprinkler system, drip irrigation system, plant protection equipments and welding machine to repair agriculture implements and farm machinery.

KVK Intervention

- Motivation for participation in vocational training programme
- Imparted practical oriented training for the same
- Provided regular technical know-how to start selfemployment



Outcome	
Income generation through repairing se	rvices

Repairing items	Services provided to farmers	Net income/year
Sprinkler system	54	66300.00
Knapsack sprayer	28	3200.00
Disc harrow	32	4700.00
Seed-cum-fertilizer drill	22	4900.00
Total	136	79100.00



12. Wings of empowerment- Success story of women entrepreneur

Name
Name of the Enterprise
Address

Mobile No.

Kavita Jain

9887399192

: Jain Foods

:

•

: Krishna Self Help Group Bhimganjmandi, Kota (Raj.)

Situation analysis: Kavita Jain belongs to lower middle class family. Her husband earning was Rs. 5-10 thousand per month, so she could not complete her family financial requirements. Kavita and her husband wanted to start a small scale enterprise form home to strengthen their economic status. They have enough space in their parental home to establish a small scale unit, her husband surveyed the nearby area for find out the demand of public regarding food processed products and they found that people of urban area are more interested in ready to eat snacks, pickles with healthy and homemade level, even coaching students also demanded the same.

Plan, Implementation and Support: Kavita Jain and her husband Adiya Jain actively participated in 15 days food processing training at Krishi Vigyan Kendra Kota in 2018 and during the training period they started to standardize their products like gram, wheat and moong puffs, soya namkin and all types of pickles. KVK home scientist helped them in product standardization, packaging, labeling, and coast calculation of all the product. They started the range of snacks with the brand name "JAIN FOODS" with healthy processing like roasted snacks, pickles without preservative.

Out Put and Outcome: Kavita started her selling in Exhibitions, melas and by home delivery. In 2019 her monthly income was more than Rs.25 thousand per months. Gradually the demands of product were increased and in the beginning of 2020 she earned more than Rs.35-40 thousand per month. Products became popular among coaching students acceptance of her snakes due reasonable price and homemade taste and purity.

Impact: In December 2020 KVK, Kota SHG were invited in ORGANIC FESTIVAL, DELHI by NIFTEM, MOFPI, Kavita participated and sale her products of Rs. 40000.00 in just three days, she also got FSSAI number and now she is delivering her products online also. She has become so successful that now hired four ladies. Presently, both are satisfied with economic status and social life.





13. Additional return with intercropping intervention

Sh. Ashwani Kumar belonging to village Amin of district Kuurukshetra is an innovative farmer for his success in intercropping of celery with vegetable pea. He used to grow vegetable pea as sole crop since last two decades. Through farmer's participatory approach in collaboration with KVK Kurukshetra. Sh. Ashwani Kumar started cultivation of celery as an intercrop in vegetable pea which proved beneficial in augmenting the farm income. He is a farmer having 6 ha land and the returns from sole crop of vegetable pea were not enough sufficient to get more profit. Thus he, in consultation with KVK subject matter specialists, has adopted the innovative intercropping of celery in vegetable pea starting from the year 2015 to 2018 in an



area of 2 to 3 ha. He harvested an additional yield of celery as 14.5 q/ha during the period under report. There was an additional income amounting Rs. 75,400/-ha from celery crop intercropped with vegetable pea. This system of intercropping provided a consistent source of income to the farmer from green vegetable pea during the last week of December to mid-February and the celery gave an additional income in the month of last week of April. Sh. Ashwani Kumar inspired the other farmers of vicinity to adopt such an innovative and income generating intercropping system in the district resulting in adoption of the technology in more than 1000 ha area.





14. Successful entrepreneurship by Bee Keeping

Situation analysis/ Problem statements: Economic status of farming community in Mahendergarh district is relatively poor. The main reason is the small land holdings of the farmers. A vast majority of farmers fall in the category of small and marginal group. Declining water resources have further limited their options for adopting diversified irrigated cropping systems. Under these circumstances farmers of this area need to adopt subsidiary occupations. Bee Keeping could be a good option as subsidiary occupation because mustard, which is the major rabi crop of the region covering 75 percent of the cultivated area provides good source of nector and pollen. Thus this district is a potential district for bee keeping.

Mr. Krishan Kumar S/o Sh. Ram Singh resident of village Mudain has only 1.5-acre land and practicising farming but could not be able to manage feed and essential house hold commodities for his family. He started this enterprise with 10 honey bee colonies during the year 1997 and since then he has been expanding this enterprise.

Technology Plan, Implement and Support: The KVK started organizing vocational training programmes for the farmers on scientific bee keeping from 2003 and till date 969 rural youths were trained for bee keeping by 17 trainings and out of which 235 rural youths started bee keeping in the district having more than 18000 bee colonies and earning approximately a total sum of 5.73 crore by selling honey in the district. Mr. Krishan Kumar came in the contact with SMS (Entomology) during 2004. The KVK suggested him to take the training on bee keeping during 2004. He underwent

training on bee keeping during 2004. After this training he started from scratch and made it big by sheer hard work and dedication. He started practicing migration of colonies during the dearth periods within the state to Ambala, Kurukshetra and also other states i.e. Himachal Pradesh, Rajasthan, Punjab and Uttar Pradesh. With his continuous efforts and hard work he earned a remarkably glorious success in bee keeping with better scientific management. He has also started sale of multiplied bee colonies as registered Bee Breeder by Govt. of Haryana and started processing honey in his own brand as Yadav Apiaries and also packed in 500g and 1 kg bottles for sale. He has also started collecting the honey from local bee keepers by providing good price to them. A local young man turned to an entrepreneur and bee keeper of the area marketed honey to local entrepreneur.

Output: On an average income worth Rs. 4200 per box per year is being generated by the entrepreneur depending on the price of honey. Now he has 600 bee boxes and is earning substantial income from the enterprise. He is now able to meet household expenses easily. He is giving emphases to provide better education and health facilities to his family. He has now become a resource person for the bee keeping trainings conducted by the KVK and other agencies. He is an example to the unemployed youths and landless farmers.

Outcome: He has generated source of income from bee keeping by sale of honey of his own farm both at whole sale price and retail price under trade name of Yadav Apiaries. He has started supply of honey to big

S.No.	Title of Program	No. of Activities	Number of Participants
1.	Vocational/ Skill training programmes on Bee Keeping	17	969
2.	Awareness Programmes through celebration of World Honey Bee Day	04	275
3.	Exposure Visits	12	370
4.	Literature Developed	02	420

Activities organized by the KVK for skill development and promotion of the enterprise are as under:





S. No.	Year	No. of boxes	Produce (kg)	Price (Rs./KG)	Gross Returns (Rs.)	Rearing Cost (Rs.)	Net Returns (Rs.)
1.	2004-05 (Initial Year of enterprise)	20	540	70.00	37800.00	35000.00	2800.00
2.	2018-19 Present Status	600	21000	90.00	1890000.00	638000.00	1252000.00

Economic Return of the enterprise established by the Bee Keeper Krishan Kumar

exporters like Ms. Khejriwal and Dabur on commission basis after purchasing from other entrepreneurs along with this his working on multiplication of bee colonies and providing them to new bee keepers. He has purchased two acres of land in his village and also Mahindra Pickup Van for transportation/ migration of honey bees and honey. He has generated employment for 5 rural youths for their livelihood at his farm for the management of bee colonies, migration purpose, extraction of honey and its packing etc.

Social Impact: Mr. Krishan Kumar has become an icon for popularizing this business in his village and surrounding villages. Many rural youths of his village after getting inspiration from him has acquired training

on bee keeping from KVK, Mahendergarh and started bee keeping. At present more than forty rural youth of Mudian village has started this occupation very successfully and earning good profit and also provide employment to other youth as helper. Adoption of this occupation as a subsidiary occupation by him gave the dignity of being progressive farmer in addition to the monetary gains. He is frequently asked by other farmers about the details of this profession. He was honored with "Best Bee Keeper" among bee keepers of Haryana by Hob'ble Chief Minster Sh. Manohar Lal Khatter on inaugural ceremony of Integrated Bee Keeping Development Center (IDBC), Ramnagar, Kurukshetra on November, 10, 2017.







15. Low tunnel cultivation technique boon for vegetable growers

Name	:	Sh. Hari Singh
Age	:	30
Mobile No.	:	8058586058
Education	:	B.A
Address	:	Village - Shahpura , P.S. Khandela District - Sikar, Rajasthan
Land holdings	:	1.5 hectare
Livestock	:	Buffalo: 4, Goat : 20
Farming experience	:	10



Situation Analysis: The production of vegetables in the Sikar district is very good but due to glut in the market, which leads to price crash in the main season. Farmers are producing a sizable quantity of vegetables like cucurbits, chilli, tomato, okra, etc. during main season which has been resulted less remunerative. Similarly, the demand of vegetables is higher than its supply primarily because all types of vegetables cannot be grown throughout the year. In the absence of cold storage infrastructure and vegetable processing industries, off-season vegetable farming is the only viable option that can add value to the farmers' produce. Such a situation responsible for a dire need to find an alternative solution for year round production of vegetables. Thus, off-season cultivation of vegetables is emerging out as a strong option to meet this demand. Off-season cultivation of vegetables will not only bring high remuneration and better financial inclusion of farmers but also bridge the widening demand-supply gap. The main objective of off season vegetable cultivation is to produce and supply the vegetables to the market during their lean period. Cultivation of fresh vegetables after or before their normal season is called as off season vegetable cultivation, which means cultivation of crop outside their regular cropping calendar i.e., when the supply is low and prices are high. The protective cultivation is the best alternative for regulating the above factors as per requirement of the crops in order to realize the maximum potential of the crops. Plastic low tunnels provide the best way for off season cultivation of vegetables specially cucurbits during winter season by

modifying the microclimate around the plants. Low tunnels also offer several advantages like protection of the crop from frost, hails, and crop advancement from 30-40 days over their normal season of cultivation.

Plan, Implement and Support

- KVK, Sikar has decided to introduce low cost structure (low tunnel technology) for off season production of vegetables in Shahpura village. One farmers form this village was very successful in their endeavour. In the past, the vegetables of different crops were not raised under low tunnel condition. Thus, they could not get good returns from our produces.
- The training and demonstrations on off season vegetable cultivation were conducted by KVK to develop skill amongst farmers for growing vegetables in off-season.
- Low-tunnels were constructed using long and narrow strips of transparent plastic material were used to cover one or several adjacent rows of vegetable plants. The polythene sheets having a thickness of 50 microns was used in this technique, which help build the greenhouse effect and enables cultivation of vegetables under protected and controlled weather conditions.
- The literature and technical support in terms of advisories, exposure visits, farmer and scientist interactions, field days were organized to showcase the technologies to the neighbouring farmers and villagers for large scale cultivation.



Output: By this innovative idea, Shri Hari Singh has succeeded in maintaining optimum plant population in winter season and crop mature 30-40 days earlier than normal season as a result he earned Rs 2,40,000 from

0.9 hectare only during zaid season which is significantly higher than other fellow farmers. Though cultivating of vegetables under low tunnels involves cost but higher returns compensated the cost.

S.No.	Сгор	Area	Gross return	Net return
1.	Summer Squash	0.4 ha	1,50,000	1,10,000
2.	Water Melon	0.4 ha	1,60,000	1,15,000
3.	Chilli	0.1 ha	24,000	15,000
Total		0.9 ha	3,34,000	2,40,000

Table: Economic performance of vegetable production

Outcome: Helped in acquiring skills and dissemination of technology in and the villages of Shahpura by covering more than 20 ha of under low tunnel. The spread of technology from farmer to farmer has gained momentum annually. The State Department of Horticulture is also encouraging the farmers to take up vegetables in off-season by providing subsidy in mulching sheet and low tunnel structure to the farmers which helped in increasing the area under this.

Impact: Among the various forcing techniques green house, poly house and net house are quite popular in western countries, however, these structures are costlier and unaffordable by the small and marginal farmers. An alternative method is the low-tunnel technology, which protects the plants against low temperature and

captures the market in early season to get good return of crop produce. Moreover, low tunnel system with plastic mulching and drip irrigation system is more beneficial during rabi and zaid season when there is scarcity of water. Moisture conserved under mulch reduces the water stress and also increase soil temperature during crop growth period which contributes to crop yield improvement. The incidence of insects and pests were also very low due to structure. Sh. Hari Singh and neighbouring farmers also adopted innovative method of growing off-season vegetables using low tunnel on ridges for enhancement of income. There are 30-35 farmers practicing the same technology of low tunnel in his village.





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