



# वार्षिक प्रतिवेदन Annual Report 2021



भाकृअनुप  
ICAR

भाकृअनुप-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान  
जोन-VIII, पुणे-411005, महाराष्ट्र

ICAR-Agricultural Technology Application Research Institute  
Zone-VIII, Pune-411005, Maharashtra

वार्षिक प्रतिवेदन  
Annual Report  
**2021**



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## Citation

Annual Report (2021).

ICAR- Agricultural Technology Application Research Institute  
Zone-VIII, Pune- 411 005, PP. 155

## Guidance

Dr. U. S. Gautam, DDG (Agril Extension)  
ICAR, New Delhi

## Published by

Director  
ICAR- ATARI, Zone-VIII, Pune

## Editor

Dr. Subrata Kumar Roy  
Shri Tushar Athare  
Dr. Rajesh T

## Compilation

Dr. Anita Deshmukh  
Ms Supriya Patil  
Mr Ganesh Gulabrao Chaware  
Mr Mahesh Balachandra Jadhav  
Ms Arati Patole  
Dr. Sneha Patil  
Ms Priyanka Bhalerao

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**ICAR-Agricultural Technology  
Application Research Institute, Zone-VIII**  
College of Agriculture Campus, Shivajinagar  
Pune 411005



**Dr. Subrata Kumar Roy**  
Director

## Preface

ICAR-Agricultural Technology Application Research Institute (ATARI), Pune is primarily responsible for systematic coordination, monitoring and reviewing of mandated activities such as technology assessment, demonstrations, planting material production, training programmes and other extension activities of 82 KVKs in three States of India, viz. Maharashtra, Gujarat and Goa. At present there are 82 KVKs in the Zone including 50 in Maharashtra, 30 in Gujarat and 2 in Goa.

During the year, KVKs in the zone have conducted 6479 On Farm Tests (OFTs) through which 613 technologies were assessed and a total of 20931 Frontline Demonstrations (FLDs) were organized in crops, livestock and enterprises in the states of Maharashtra, Gujarat and Goa as an effort to promote adoption of improved technologies. KVKs have also organized 6670 training courses which includes 5310 courses for farmers, 871 courses for rural youth and 489 courses for extension personnel.

During 2021, KVKs conducted 5740 number of cluster frontline demonstrations on pulses covering an area of 2296.00 ha under the National Food Security Mission (NFSM). Similarly, 4885 number of CFLDs were conducted on oilseeds covering an area of 1954.00 ha under NFSM. Seed hubs for pulses is operational at 14 KVK's in Zone-VIII in the states of Maharashtra (8) and Gujarat (6). Seed hub KVK's produced 4893.16 q of seed for supply of quality seed of crops like, soybean, greengram, blackgram, redgram and Bengal gram. Two Sixty-Four (264) enterprise units were established under

Attracting Rural Youth in Agriculture (ARYA) Project. A total of 6670 training courses were conducted benefitting 310817 farmers, farm women and extension personnel. A total of 50978 number of extension activities were taken up by the KVKs with the participation of 16, 80,285 farmers and extension personnel. KVKs were equipped with mini soil testing laboratories to provide soil testing service to farmers. A total of 69275 samples including soil (61018), water (7522) and plant (735) samples were analyzed benefitting 66042 farmers.

We acknowledge the contributions of Vice-Chancellors and Directors of Extension of SAUs, Horticulture and Veterinary Universities and Directors of ICAR institutes in Zone-VIII for providing necessary technological backstopping to the KVKs. We gratefully acknowledge the constant support, guidance and encouragement received from Dr. Himanshu Pathak, Secretary, DARE & DG, ICAR, Govt. of India, Dr. U. S. Gautam, DDG (Agril Extension), Dr. R. R. Burman, ADG (Agril Extension), Dr. R. K. Singh; ADG (AE) and all the colleagues of Agricultural Extension Division in the Council HQ for their constant encouragement, guidance and support in executing the mandates of the institute. I also thankfully acknowledge the commendable efforts and contributions made by Shri. Tushar Athare (Scientist), Dr. Rajesh T (Scientist) and entire team of ATARI including project staff of the institute in bringing out this publication within a stipulated time period.

**(Dr. Subrata Kumar Roy)**

Place : Pune





# कार्यकारी सारांश

आईसीएआर- अटारी महाराष्ट्र, गुजरात और गोवा राज्यों में 82 कृषि विज्ञान केंद्रों के मजबूत नेटवर्क के माध्यम से कृषि प्रौद्योगिकी प्रसार में एक महत्वपूर्ण और सक्रिय भूमिका निभा रहा है। अटारी पुणे इन 82 केवीके की अनिवार्य गतिविधियों की निगरानी, समन्वय और समीक्षा करता है, जिनमें से 50 महाराष्ट्र में, 30 गुजरात में और 2 गोवा में हैं। ये केवीके विभिन्न सरकारी और गैर सरकारी संगठनों के प्रशासनिक नियंत्रण में हैं। 82 कृषि विज्ञान केंद्रों में से राज्य कृषि विश्वविद्यालय के पास 38 केवीके, एनजीओ 35 केवीके, आईसीएआर संस्थानों में 4 केवीके, 3 केवीके डीमड यूनिवर्सिटी के साथ हैं एवं 1 केवीके राज्य विभाग और 1 केवीके मुक्त विश्वविद्यालय के साथ है। केवीके का मुख्य काम प्रौद्योगिकी मूल्यांकन, प्रदर्शन, रोपण सामग्री उत्पादन, प्रशिक्षण कार्यक्रम और अन्य विस्तार गतिविधि है। केवीके जिला स्तर पर वैज्ञानिक खेती पर ज्ञान और संसाधन केंद्र के रूप में कार्य करता है। वर्ष 2021 के दौरान केवीके द्वारा आयोजित विभिन्न गतिविधियों का सारांश नीचे दिया गया है।

## तकनीकी मूल्यांकन

कृषि विज्ञान केन्द्रों के द्वारा कुल 6479 प्रक्षेत्र परीक्षण (ओएफटी) आयोजित किए गए थे जिसमें से 4362 फसलों एवं 1099 पशुधन और 1018 उद्यमों के अन्तर्गत प्रौद्योगिकी के परीक्षण शामिल हैं। इस प्रक्रिया के दौरान 613 प्रौद्योगिकियों का मूल्यांकन किया गया जिसके अंतर्गत 428 फसलों, 97 पशुधन और 88 उद्यमों के अंतर्गत शामिल थे। विभिन्न फसलों पर किए गए कुल 4362 तकनीकीयों पर प्रक्षेत्र परीक्षण हुए जिसके अंतर्गत महाराष्ट्र राज्य द्वारा 3491, गुजरात राज्य द्वारा 831 एवं गोवा राज्य द्वारा 40 प्रक्षेत्र परीक्षण संचालित किए गए। इस प्रक्रिया में 428 प्रौद्योगिकी विकल्पों के परीक्षणका मूल्यांकन किया गया। जिसके अंतर्गत महाराष्ट्र राज्य में 293, गुजरात राज्य में 128 और गोवा राज्य में 7 प्रक्षेत्र परीक्षण संचालित किए गए। पशुधन के अंतर्गत केवीके ने कुल 1099 प्रक्षेत्र परीक्षण संचालित किए गए जिसके अंतर्गत महाराष्ट्र में 918 और गुजरात में 181 प्रक्षेत्र परीक्षण संचालित किए गए। यह उपलब्धि 97 परीक्षणों के माध्यम से प्राप्त की गयी थी। जिसके अंतर्गत महाराष्ट्र में 79 और गुजरात में 18 प्रक्षेत्र परीक्षण संचालित किए गए।

## प्रथम पंक्ति प्रदर्शन:

जोन-8 के अंतर्गत कुल 20931 प्रथम पंक्ति प्रदर्शन आयोजित कराये गये जिसमें से अनाज और पोषक अनाज की फसल पर 3135, तिलहन पर 1078, दालों पर 1764, वाणिज्यिक फसलों

पर 252, चारा फसलों पर 352, सब्जी फसलों पर 1486, कंद फसलों पर 126, और फल फसलों पर 889 अग्रिम पंक्ति प्रदर्शन आयोजित किए गए। महाराष्ट्र, गुजरात और गोवा राज्यों के उद्यमों पर प्रदर्शन के अंतर्गत वृक्षारोपण फसलों पर 40, मसालों पर 755, औषधीय फसलों पर 20, विभिन्न फसलों के संकरों पर 1792 प्रदर्शन किए गए। इसके अति रिक्त कृषि उपकरणों पर 1974 प्रदर्शन, पशुधन पर 3941 और उद्यमों पर 3255 प्रदर्शन आयोजित किए गए। 20931 प्रथम पंक्ति प्रदर्शन से महाराष्ट्र राज्य के केवीके द्वारा 9777 अग्रिम प्रदर्शन 1653.35 हेक्टेयर क्षेत्र में एवं 11033 अग्रिम पंक्ति प्रदर्शन गुजरात के कृषि विज्ञान केन्द्रों द्वारा 2092.17 हेक्टेयर क्षेत्र में और गोवा राज्य ने 121 अग्रिम प्रदर्शन 7.5 हेक्टेयर क्षेत्र में द्वारा विभिन्न फसलों में संचालित किए गए।

## प्रशिक्षण कार्यक्रम

सभी कृषि विज्ञान केन्द्रों द्वारा कुल 6670 प्रशिक्षण आयोजित किये, जिसमें 5310 प्रशिक्षण कृषक और 871 ग्रामीण युवक एवं 489 प्रशिक्षण कृषक विस्तार कर्मियों के लिए आयोजित किये। कुल 310817 प्रतिभागियों को प्रशिक्षित किया गया जिसमें 255670 कृषक, 32936 ग्रामीण युवा और 22211 विस्तार कर्मी शामिल थे। इसके अतिरिक्त 950 प्रायोजित और 286 व्यावसायिक प्रशिक्षण भी आयोजित किए गए। महाराष्ट्र राज्य में 3892, गुजरात राज्य में 2622 और गोवा राज्य में 156 प्रशिक्षण आयोजित किये।

## प्रसार कार्यक्रम

जोन के अंतर्गत सभी कृषि विज्ञान केन्द्रों द्वारा कुल 51014 प्रसार कार्यक्रम जैसे, किसान गोष्ठी, प्रक्षेत्र दिवस, विधि प्रदर्शन, किसान गोष्ठी का आयोजन किया गया और कुल 1680285 कृषक जिसमें 339289 एस सी /एस टी कृषक और 35705 विस्तार कर्मी शामिल थे। जिसके अंतर्गत महाराष्ट्र राज्य के 25987 प्रसार कार्यक्रम में 1128656 कृषक एवं 28246 विस्तार कर्मी शामिल थे। वहीं गुजरात राज्य के 24195 प्रसार कार्यक्रम में 456653 कृषक एवं 7390 विस्तार कर्मी शामिल थे। और गोवा राज्य के 832 प्रसार कार्यक्रम में 16908 कृषक एवं 110 विस्तार कर्मी शामिल थे। इसके अलावा 82094 प्रसार गतिविधियों में जैसे इलेक्ट्रॉनिक मीडिया, प्रसार साहित्य, समाचार प्रकाशन लेख, रेडियो व दूरदर्शन वार्ता तथा मोबाईल द्वारा कृषक सलाह दी गई।



## बीज व रोपण सामग्री उत्पादन

तीनों राज्यों के कृषि विज्ञान केन्द्रों द्वारा 12734.51 किंचटल बीज, 683.80 किंचटल जैव उत्पाद, 25.43 लाख पौध, 36.37 लाख संकर प्रजातियों की पौध सामग्री तथा 9.83 लाख फिंगरलिंगस, गाय, भैंस व बकरियों के बच्चे उपलब्ध कराये गए।

## राष्ट्रीय जलवायु समुत्थान कृषि में परिवर्तन (NICRA)

कृषि जलवायु अनुकूल व प्राकृतिक संसाधन प्रबंधन हेतु महाराष्ट्र में 6 तथा गुजरात में 4 और गोवा राज्य में 1 कृषि विज्ञान केन्द्रों द्वारा 459.76 हे. क्षेत्र पर 705 कृषक प्रक्षेत्रों पर 8 गाँवों में कार्यक्रम चलाये गये। कस्टम हायरिंग केन्द्रों के 19 कृषि उपकरण व मशीनों का 566 कृषकों के द्वारा 240.30 हे. क्षेत्र में उन्नत खेती करने हेतु उपयोग किया गया। इससे छोटे व मझोले किसानों को लाभ पहुंचा और सेक्टर ने 0.22 लाख रुपये प्राप्त किये।

## कृषि में युवकों को आकर्षित व रोकने हेतु योजना (ARYA)

आर्या कार्यक्रम 12 कृषि विज्ञान केन्द्रों (महाराष्ट्र में नागपुर - I, नाशिक I, उस्मानाबाद, पुणे - II, वाशिम व सोलापुर तथा गुजरात में राजकोट - I, भावनगर, खेडा, नवसारी, आनन्द व अमरेली) में चल रहा है। कुल 3632 ग्रामीण युवकों को स्वयं का व्यवसाय आरम्भ करने हेतु प्रशिक्षण दिये गये। 264 युवकों ने अपना व्यवसाय कृषि विज्ञान केन्द्रों की सहायता से शुरू किया है।

## फार्मर फर्स्ट परियोजना (Farmer FIRST)

इस परियोजना के तहत कृषकों की वास्तविक प्रक्षेत्र व पारिवारिक परिस्थितियों को ध्यान में रखकर कृषि तकनीकी उपयोग, कृषक व वैज्ञानिकों के बीच सम्बंध एवं तालमेल, विभिन्न विभागों से समन्वयन तथा जीविकोपार्जन हेतु गतिविधियों का आयोजन किया गया। जोन -8 में जूनागढ कृषि विश्वविद्यालय, नवसारी कृषि विश्वविद्यालय तथा महात्मा फुले कृषि विद्यापीठ, राहुरी द्वारा यह कार्यक्रम संचालित किया जा रहा है। जूनागढ में 1884 कृषक परिवार, राहुरी में 1150 परिवार तथा नवसारी में 713 कृषक परिवारों को भागीदार बनाकर कृषक समस्या समाधान हेतु विशेष कार्यक्रम चलाये जा रहे हैं।

## दलहनी व तिलहनी फसलों पर क्लस्टर प्रथम पंक्ति प्रदर्शन (CFLDs)

दलहनी व तिलहनी फसलों के उत्पादन व उत्पादकता बढ़ाने हेतु क्लस्टर रणनीति अपनाकर महाराष्ट्र व गुजरात के कृषि विज्ञान केन्द्रों द्वारा प्रथम पंक्ति प्रदर्शन आयोजित किये गये। दलहनी फसलों पर

5740 प्रदर्शन 2296 हे. क्षेत्र में आयोजित किये गये। तिलहनी फसलों में 4885 प्रदर्शन 1054 हे. क्षेत्रफल में कराये गये। मुख्य रूप से अरहर, चना, उर्द, मूँग, मूँगफली, सोयाबीन, तिल, अरंडी, अलसी, कुसुम आदि फसलों पर वैज्ञानिक तकनीकी अपनाने को कृषकों को प्रेरित भी किया गया।

## पल्सेस सीड हब परियोजना (Pulses Seed Hub)

यह कार्यक्रम महाराष्ट्र में 8 कृषि विज्ञान केन्द्रों (जालना, धुले, सोलापुर-II, बीड-II, अकोला, बुलढाणा-II, जलगाँव-II व अमरावती-II) तथा गुजरात में 6 केन्द्रों (तापी, नवसारी, खेडा, राजकोट-II, पंचमहल व दाहोद) पर गुणवत्तायुक्त दलहनी फसलों के उन्नतशील बीजों का उत्पादन करने हेतु आरम्भ किया गया। खरीफ में 623.52 कुन्तल तथा रबी सीजन में 4107.17 कुन्तल बीज पैदाकर कृषकों में वितरित किया गया।

## ट्राइबल सब प्लान (ट्रीलरश्र डील झश्रप)

भारत सरकार द्वारा जन जातीय क्षेत्रों के कृषकों के विकास हेतु कृषि, पशुपालन, मुर्गीपालन, बकरी पालन तथा अन्य कृषि से जुड़े व्यवसायों से सम्बंधित कार्यक्रम ग्यारह कृषि विज्ञान केन्द्रों द्वारा चलाये गये। इन केन्द्रों पर प्रशिक्षण, प्रदर्शन, प्रक्षेत्र परीक्षण, बीज उत्पादन तथा आय बढ़ाने हेतु कार्यक्रमों पर विशेष बल दिया गया।

## विशेष कार्यक्रम

कृषकों के विकास व कल्याण हेतु कृषि विज्ञान केन्द्रों के माध्यम से अनेक पहल की गई। 80 कृषि विज्ञान केन्द्रों द्वारा संविधान दिवस मनाया जिसमें 10507 कृषकों ने भाग लिया। 80 केन्द्रों द्वारा विश्व मृदा दिवस मनाया जिसमें 5390 कृषकों ने मृदा स्वास्थ्य के बारे में जानकारी प्राप्त की। 71 कृषि विज्ञान केन्द्रों द्वारा राष्ट्रीय महिला किसान दिवस मनाया जिसमें 4461 महिलाओं ने भाग लिया।

## किसान मोबाइल सलाहकार सेवाएं

जोन के 82 केवीके ने 3588620 किसानों को 18,621 संदेश भेजे गए हैं जिसमें फसलों (5635), मौसम (4460), पशुधन (4742), अन्य उद्यमों (772), जागरूकता (2361) और विपणन (668) से संबंधित थे।

## मृदा, जल और पौधों का विश्लेषण

कृषि विज्ञान केन्द्रों द्वारा 66042 किसानों से प्राप्त मिट्टी (61018), पानी (7522) और पौधे (735) के 69275 नमूनों का विश्लेषण किया जिसके आधार पर किसानों को 61913 मृदा स्वास्थ्य कार्ड वितरित किये गये।

# Executive Summary



ICAR- ATARI has been playing an important and proactive role in the agricultural technology dissemination through its strong network of 82 Krishi Vigyan Kendras in states of Maharashtra, Gujarat and Goa. ATARI Pune monitors, coordinates and review mandated activities of these 82 KVKs of which 50 are in Maharashtra, 30 in Gujarat and 2 in Goa. These KVKs are under the administrative control of various government and non government organisations. State Agriculture Universities administer 38 KVKs, NGOs 35 KVKs, ICAR Institutes have 4 KVKs, 3 KVKs are with deemed university and 1 KVK each is with state department and open university in the zone. The mandate of KVK is technology assessment, demonstrations, planting material production, training programmes and other extension activity, thereby serving as the knowledge and resource centre on scientific farming at the district level. Summary of various activities conducted by KVKs during the year 2021 is given below.

## Technology Assessment through On-Farm Testing

A total of 6479 on Farm Trials (OFTs) were conducted during the year which included 4362 under crops, 1099 under livestock and 1018 on other enterprises. Through on farm testing process, 613 technologies were assessed including 428 under crops, 97 under livestock and 88 under other enterprises. Out of 4362 OFTs taken up on various crops, 3491 OFTs were implemented in Maharashtra, 831 OFTs were implemented in Gujarat and 40 OFTs in Goa. Total 428 technological options were assessed on crop out of which 293 were in Maharashtra, 128 in Gujarat and 7 in Goa. In livestock component, KVKs conducted 1099 OFTs, 918 in Maharashtra and 181 in Gujarat. Activities led to assessment of 97 technological options, 79 in Maharashtra and 18 in Gujarat.

## Frontline Demonstrations

A total of 20931 frontline demonstrations were conducted including 3135 on cereals and millets, 1078 on oilseeds, 1764 on pulses, 252 on commercial crops, 352 on fodder crops, 755 on spices, 126 on tuber crops, 1486 on vegetable, 889 on fruit crops, 72 on flower crops, 40 on plantation crops, 755 on spices, 20 on medicinal and

aromatic crops, 1792 on hybrids of various crops, besides 1974 demonstrations on farm implements, 3941 demonstrations on livestock and 3255 demonstrations on enterprises in the states of Maharashtra, Gujarat and Goa. Of total 20931 FLDs 9777 FLDs were conducted by KVKs of Maharashtra covering an area of 1653.35 ha followed by 11033 FLDs by KVKs of Gujarat in 2092.17 ha area and 121 FLD conducted by KVKs of Goa in 7.5 ha area under various crops.

## Training and Capacity Building

KVKs organized 6670 training courses which includes 5310 courses for farmers, 871 courses for rural youth and 489 courses for extension personnel. A total of 310817 participants were trained comprising of 255670 farmers, 32936 rural youth and 22211 extension personnel. In addition, 950 sponsored and 286 vocational courses were organized. Out of 6670 training courses, 3892 training courses conducted by KVKs of Maharashtra followed by 2622 training courses by KVKs of Gujarat and 156 training courses by KVKs of Goa.

## Extension Programmes

KVKs carried out a total of 51014 extension activities and created awareness among 16,80,285 farmers including 3,39,289 SC/ST farmers and 35,705 extension personnel. The major activities included Diagnostic visits, Exhibition, Farmers' seminar /workshop and field day. 25,987 extension programmes were organized by involving 11,28,656 farmers and 28246 extension personnel in Maharashtra. Gujarat KVKs organised 24,195 extension programmes involving 4,56,653 farmers and 7390 extension officials, while in Goa 832 extension programmes were conducted in which 16908 farmers and 110 extension personnel benefitted. Other extension activities like extension literature (26503) and popular articles (2859) besides newspaper coverage (3699), radio coverage/ talks (863) and T. V. coverage/ talks (225) were also undertaken by KVKs.

## Seed, Planting Materials, Bio-Products and Livestock Material Production

KVKs of the Zone produced and supplied 12734.51q seeds of different crop varieties, 98304.55 lit liquid and



68380.73 kg solid bio-products, 25.43 lakh of planting materials of varieties, 36.37 lakh number of planting materials of hybrids and 9.83 lakh number of livestock and fingerlings.

### **National Innovations in Climate Resilient Agriculture (NICRA)**

Under NICRA project, 6 KVKs of Maharashtra (Ahmednagar-I, Jalna-I, Osmanabad, Nandurbar, Latur, Beed-I,) 4 KVKs of Gujarat (Narmada, Dahod, Panchmahal, Banakantha-I and one KVK of Goa (North Goa) state undertook various activities. A total of 459.76 ha area has been treated with NRM related interventions covering 705 farmers' fields in order to build climate resilience in 8 villages benefiting 2619 farmers. In respect of custom hiring centres, 566 farmers of NICRA villages have used 19 implements on 240.30 ha area for timely sowing and other cultural operations. The revenue of Rs 0.22 lakh was generated through these custom hiring centres.

### **Attracting and Retaining Youth in Agriculture (ARYA) Project**

Under ARYA project 12 Centres (In Maharashtra Nagpur-I, Nashik-I, Osmanabad, Pune-II, Washim and Solapur-I whereas in Gujarat, Rajkot-I, Bhavnagar, Kheda, Navsari, Anand and Amreli) took up initiative to empower youth in rural areas to take up agriculture and allied and service sector enterprises for gainful employment. Total of 3632 rural youths were trained in various enterprise based modules. Agriculture and allied products based enterprises were started by 264 youth under ARYA project implemented by KVKs during the year.

### **Farmers FIRST Project**

Farmer FIRST aims at enriching farmers-scientists interface for technology development and application. The aim of program is to achieve with focus on innovations; feedback; multiple stakeholders' participation; multiple realities; multi method approaches; vulnerability and livelihood interventions. Under Zone VIII, 3 Farmer FIRST projects were implemented at MPKV, Rahuri, NAU, Navsari and JAU, Junagadh. MPKV, Rahuri adopted 4 clusters of villages benefitting 1150 Families; NAU, Navsari covered 3 clusters of villages including 713 farm families; and JAU, Junagadh worked in 4 villages facilitating 1884 families.

### **Cluster Frontline Demonstrations on Pulses and Oilseeds**

Cluster Frontline Demonstrations of Pulses under NFSM was started to enhance the pulses yield covering major

pulse crops viz, pigeon pea, chickpea, black gram and green gram in selected districts through 66 KVKs in Maharashtra and Gujarat. In total, 5740 demonstrations were laid out in cluster mode on 2296.00 ha area.

Cluster Frontline Demonstrations on Oilseeds were implemented to enhance productivity of oilseeds. Groundnut, sesame, soybean, castor, linseed, safflower and rapeseed and mustard crops were covered by 70 KVKs in selected districts of Maharashtra and Gujarat. A total of 4885 cluster frontline demonstrations were conducted in an area of 1954.00 ha.

### **Pulses Seed Hub Project**

Pulses Seed Hub Project is being implemented at 8 centres in Maharashtra (Jalna-I, Dhule, Solapur-II, Beed-II, Amravati-II, Akola, Buldhana-II, Jalgaon-II) and 6 centres in Gujarat (Tapi, Navsari, Kheda, Rajkot- I, Panchmahal and Dahod) with specific objective of enhancing quality seed production for benefitting the farmers. In kharif season, seed production of 623.52 q was achieved whereas in rabi season, seed production of 4107.17 q was attained. In case of summer, seed production of 162.47 q was obtained.

### **Tribal Sub Plan**

Tribal Sub Plan (TSP) aims to achieve tribal welfare through organization of different activities related to agriculture, livestock, poultry, goat rearing and other enterprises. In Zone, 11 KVKs are involved in organizing several activities like capacity building programs, frontline demonstrations (6761), on farm trials (843), seed (1166.17q) and planting material (9.11 lakh) production and creating income generating activities in tribal dominated areas for their socio economic transformation.

### **Special Programs**

Constitution Day (67 KVKs) saw participation of 10507 farmers; World Soil Day (80 KVKs) attended by 5390 farmers; Rashtriya Mahila Kisan Diwas Celebration (71 KVKs) benefitted 4461 participants.

### **Kisan Mobile Advisory Services**

Eighty-Two KVKs of the zone sent 18,621 text messages to 3588620 farmers. Messages were related to crops (5635), weather (4460), livestock (4742), other enterprises (772), awareness (2361) and marketing (668).

### **Soil, Water and Plant Analysis**

KVKs analysed 69275 samples of soil (61018), water (7522) and plant (735) received from 66042 farmers and 61913 soil health cards were distributed to farmers.

## Chapter 1

# Introduction

To monitor and coordinate transfer of technology projects/ activities, Zonal Coordination Unit (ZCU) was established in 1979 by ICAR at 08 locations across India. These ZCUs upgraded to Zonal Project Directorate (ICAR-ZPD) in March, 2009 that was further upgraded as ICAR-Agricultural Technology Application Research Institute (ICAR-ATARI) in July, 2015. Three new ATARIs (Pune, Guwahati, and

Patna) were sanctioned in 2015 for effective monitoring, coordinating, and reviewing the KVKs and started functioning from 2017. The states of Maharashtra, Gujarat and Goa came under the jurisdiction of Zone-8 ATARI Pune. The jurisdiction of each ATARI with number of states/ union territories are given in Table 1.1.

**Table 1.1 States and Union Territories covered under ATARIs**

Zones	No. of States/ UTs	States/Union Territories
I	4	Punjab, Uttarakhand, Himachal Pradesh, Jammu & Kashmir
II	3	Rajasthan, Haryana and Delhi
III	1	Uttar Pradesh
IV	2	Bihar and Jharkhand
V	3	WestBengal, Odisha, Andaman & Nicobar
VI	3	Assam, Arunachal Pradesh and Sikkim
VII	5	Tripura, Nagaland, Manipur, Mizoram and Meghalaya
VIII	5	Maharashtra, Gujarat, Goa, Daman and Diu, Dadra & Nagar Haveli
IX	2	Madhya Pradesh and Chhattisgarh
X	4	Andhra Pradesh, Telangana, Tamil Nadu and Puducherry
XI	3	Karnataka, Kerala and Lakshadweep

### Mandate of ATARI

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

### Major Functions of ATARI

- Planning, monitoring and reviewing of KVK activities in the zone; to identify, prioritize and implement various activities related to technology integration and dissemination.
- Coordinating with SAUs, ICAR institutes, NGOs, line departments and voluntary organizations in the zone for implementation of KVK mandated activities, and
- Facilitating financial and infrastructural support to KVKs for effective functioning.

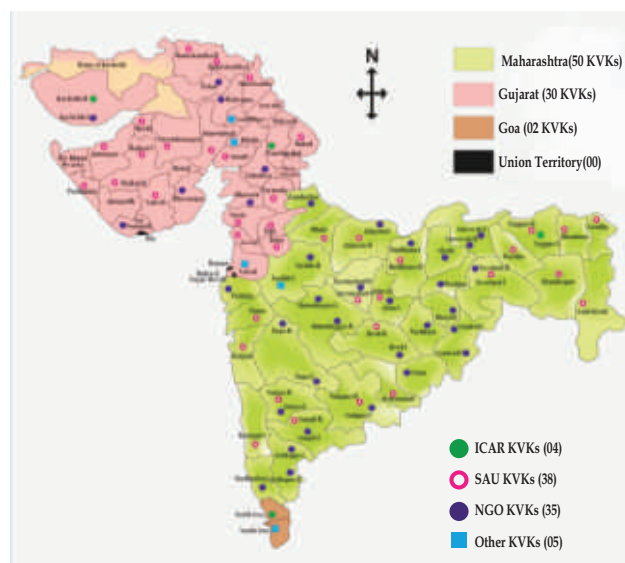
## KVKs in Zone VIII, ATARI, Pune

ATARI Zone-VIII, covers states of Maharashtra, Gujarat and Goa comprising of 82 KVKs; of which 50, 30 and 2 exist in the respective states. The state-wise and host organization wise distribution of KVKs is given in Table 1.2.

**Table 1.2 Host Organization wise KVKs in the Zone**

State	Host Organizations						Total
	SAUs	NGOs	ICAR	DUs	OUss	SDA	
Maharashtra	20	28	01	-	01	00	50
Gujarat	18	07	02	03	-	00	30
Goa	-	-	01	-	-	01	02
<b>Total</b>	<b>38</b>	<b>35</b>	<b>04</b>	<b>03</b>	<b>01</b>	<b>01</b>	<b>82</b>

## Network of KVKs in ICAR-ATARI, Pune



## Additional KVKs in Larger Districts of the Zone

In Maharashtra sixteen Districts (Amravati, Ahmednagar, Pune, Nashik, Aurangabad, Buldhana, Nanded, Beed, Yavatmal, Solapur, Jalgoan, Satara, Jalna, Kolhapur, Sangli and Nagpur) have two KVKs. In Gujarat three districts (Banaskantha, Kutchh and Rajkot) have two KVKs.

## Establishment of New KVKs

5 new KVKs (Kolhapur-II, Jalna-II, Nagpur-II, Sangli-II and Thane) have been established since the starting of ATARI Pune and site selection committee visited sites for Silvassa KVK (Dadra & Nagar Haveli).

### 1.3 Details about recently established KVKs

Name of KVK established	State	Year	New/Additional KVK	Host Organization
KVK Kolhapur-II	Maharashtra	2018	Additional	Shri Siddhagiri Math, Kaneri, Kolhapur
KVK Jalna-II	Maharashtra	2018	Additional	VNMKV, Parbhani
KVK Nagpur-II	Maharashtra	2019	Additional	MAFSU Nagpur
KVK Sangli-II	Maharashtra	2019	Additional	MAFSU Nagpur
KVK Thane	Maharashtra	2021	New	MAFSU Nagpur

## Krishi Vigyan Kendra

Krishi Vigyan Kendra is a frontline extension model at district level, designed and nurtured by the ICAR for the past four decades since 1974 when the first KVK was established at Pondicherry. The KVK showcases the frontier technologies, develop the capacity of different stakeholders, front runner in technology application, making available technological information and inputs, practicing participatory approaches in planning, implementing,

executing and evaluating the technologies. The center also pursues assessment and refinement of technologies to suit different agro-climatic conditions. The KVK follows basic concept of imparting learning through work experience, training to extension personnel, flexible, customized syllabus for different areas based on agro-ecological needs. The problems of Maharashtra, Gujarat and Goa are quite diverse ranging from acute drought to surplus water management.

### Vision of KVK

Science and technology-led growth leading to enhanced productivity, profitability and sustainability of agriculture.

### Mission of KVK

Farmer-centric growth in agriculture and allied sectors through application of appropriate technologies in specific agro-ecosystem perspective.

### Mandate of KVK

Technology Assessment and Demonstration for its Application and Capacity Development.

### Activities of KVK

To implement the mandate effectively, the following activities are envisaged for each KVK

- On-farm testing to assess the location specificity of agricultural technologies under various farming systems.
- Frontline demonstrations to establish production potential of technologies on the farmers' fields.
- Capacity development of farmers and extension personnel to update their knowledge and skills on modern agricultural technologies.
- To work as Knowledge and Resource Centre of agricultural technologies for supporting initiatives of public, private and voluntary sector in improving the agricultural economy of the district.
- Provide farm advisories using ICT and other media means on varied subjects of interest to farmers

**Table 1.4: Host Organization wise KVKs**

Sr. No	KVKs	Year of Sanction and Host Organization	Sr. No	KVKs	Year of Sanction and Host Organization
<b>Maharashtra</b>					
<b>PDKV, Akola</b>					
1.	Wardha	1976-SAU	2.	Chandrapur	1999 -SAU
3.	Bhandara	2002-SAU	4.	Gadchiroli	2004-SAU
5.	Gondia	2004-SAU	6.	Yavatmal-I	2004-SAU
7.	Buldhana-II	2010 -SAU			
<b>VNMKV, Parbhani</b>					
8.	Aurangabad-I	1983 -SAU	9.	Osmanabad	2004 -SAU
10.	Beed-II	2010 -SAU	11.	Jalna-II	2018 -SAU
<b>MPKV, Rahuri</b>					
12.	Dhule	1983 -SAU	13.	Jalgaon-II	2010 -SAU
14.	Satara-II	2010 -SAU	15.	Solapur-II	2011 -SAU
<b>BSKKV, Dapoli</b>					
16.	Ratnagiri	1983 -SAU	17.	Raigad	2004 -SAU
<b>Rural Development &amp; Research Foundation, Akola</b>			<b>Grammonnati Mandal, Pune</b>		
18.	Akola	2010 -NGO	19.	Pune-II	2010 -NGO
<b>Manjara Charitable Trust, Latur</b>			<b>Saint Namdeo Sevakbhavi Sanstha, Hingoli</b>		
20.	Latur	2005 -NGO	21.	Hingoli	2002 -NGO



Sr. No	KVKs	Year of Sanction and Host Organization	Sr. No	KVKs	Year of Sanction and Host Organization
<b>Dr. Hedgewar Seva Samiti, Nandurbar</b>			<b>Sharam Safayala Foundation, Amravati</b>		
22.	Nandurbar	2002 -NGO	23.	Amravati-I	1995 -NGO
<b>Sharam Sadhana Trust, Amravati</b>			<b>Sindhudurg Zila Krishi Pratishthan, Sindhudurg</b>		
24.	Amravati-II	1995 -NGO	25.	Sindhudurg	1995 -NGO
<b>YCMOU, Nashik</b>			<b>Jeevan Jyoti Charitable Trust, Parbhani</b>		
26.	Nashik-I	1994 -YCMOU	27.	Parbhani	1994 -NGO
<b>D.Y. Patil Education Society, Kolhapur</b>			<b>Satpuda Edu. Society Jalgaon, Jamod, Buldhana</b>		
28.	Kolhapur-I	1994 -NGO	29.	Buldhana-I	1994 -NGO
<b>J.N. Instt. of Edn. Sci. &amp; Tech. Research, Pokharni, Nanded</b>			<b>Shabari Krishi Pratishthan, Solapur</b>		
30.	Nanded-I	1994 -NGO	31.	Solapur-I	1994 -NGO
<b>SUVIDE Foundation, Washim</b>			<b>DRI, New Delhi</b>		
32.	Washim	1994 -NGO	33.	Beed-I	1992 -NGO
<b>Kalyani Gorakshan Trust, Pune</b>			<b>Agril. Development Trust, Baramati, Pune</b>		
34.	Satara-I	1992 -NGO	35.	Pune-I	1992 -NGO
<b>Pravara Instt. of Res. &amp; Edn. in Natural &amp; Soc. Sci., Ahmednagar</b>			<b>Vasant Prakash Vikas Pratishthan, Sangli</b>		
36.	Ahmednagar-I	1992 -NGO	37.	Sangli-I	1992 -NGO
<b>Marathwada Sheti Sahayya Mandal, Jalna</b>			<b>Satpuda Vikas Mandal PO Pal, Jalgaon</b>		
38.	Jalna-I	1992 -NGO	39.	Jalgaon-I	1984 -NGO
<b>Gokhle Edn. Society, Nashik</b>			<b>Rich Field Agro-e-Research &amp; Development Centre, Nashik</b>		
40.	Palghar	1976 -NGO	41.	Nashik-II	2011-NGO
<b>Mahatma Gandhi Mission, Aurangabad</b>			<b>Sanskriti Samvardhan Mandal, Sagroli, Nanded</b>		
42.	Aurangabad-II	2011-NGO	43.	Nanded-II	2011-NGO
<b>Shri Marutrao Ghule Patil Shikshan Sanstha, Newasa, Ahmednagar</b>			<b>Navsanjivan Shikshan Prasarak Mandal, Yavatmal</b>		
44.	Ahmednagar-II	2011-NGO	45.	Yavatmal-II	2016 -NGO
<b>Shri Sidhagiri Math, Kolhapur</b>			<b>ICAR-CICR, Nagpur</b>		
46.	Kolhapur-II	2018 -NGO	47.	Nagpur-I	1994 -ICAR-CICR
<b>Maharashtra Animal &amp; Fishery Sciences University (MAFSU), Nagpur</b>					
48.	Sangli-II	2019- SAU	49.	Nagpur-II	2019-SAU
50.	Thane	2021- SAU			
<b>Gujarat</b>					
<b>NAU, Navsari</b>					
1.	Dang	1985 -SAU	2.	Tapi	2004 -SAU
3.	Narmada	2006 -SAU	4.	Navsari	2006 -SAU
5.	Surat	2011 -SAU			
<b>JAU, Junagadh</b>					
6.	Jamnagar	2004 -SAU	7.	Amreli	2004 -SAU
8.	Rajkot-I	2004 -SAU	9.	Surendranagar	2005 -SAU

Sr. No	KVKs	Year of Sanction and Host Organization	Sr. No	KVKs	Year of Sanction and Host Organization
10.	Porbandar	2004 -SAU	11.	Rajkot-II	2012 -SAU
12.	Morbi	2016 -SAU			
<b>AAU, Anand</b>					
13.	Dahod	1976 -SAU	14.	Anand	1985 -SAU
15.	Ahmedabad	2004 -SAU			
<b>SDAU, SK Nagar</b>					
16.	Banaskantha-I	1976 -SAU	17.	Sabarkantha	2004 -SAU
18.	Banaskantha-II	2015 -SAU			
<b>DU, Gujarat Vidyapeeth, Ahmedabad</b>					
19.	Gandhinagar	1977 -DU	20.	Valsad	1992 -DU
21.	Kheda	2005 -DU			
<b>ICAR-CIAH, Bikaner</b>			<b>ICAR-CAZRI, Jodhpur</b>		
22.	Panchmahal	2005-ICAR-CIAH	23.	Kutch-II	2010-ICAR-CAZRI
<b>Lokbharati Gram vidyapeeth, Bhavnagar</b>					
24.	Bhavnagar	2009 -NGO	25.	Junagadh	2007 -NGO
<b>Mehsana District Education Foundation, Baroda</b>			<b>Bhartiya Agro Industries Foundation, Baroda</b>		
26.	Mehsana	2005-NGO	27.	Bharuch	1994 -NGO
<b>Mangal Bharti Bahadurpur, Baroda</b>			<b>Sarswati Gram Vidyapeeth Samoda</b>		
28.	Vadodara	1994 -NGO	29.	Patan	1992 -NGO
<b>Rural Agro. Research &amp; Development Society, Mumbai</b>					
30.	Kutch-I	1992 -NGO			
<b>Goa</b>					
<b>State Government, Goa</b>			<b>ICAR-CCARI, Goa</b>		
1.	South Goa	2004 -State Govt.	2.	North Goa	1984-ICAR-CCARI

### Agro-climatic Zones (ACZ) in Zone-VIII, Pune

There are 63 districts under the jurisdiction of Zone-

VIII, Pune in which 82 KVKs are functioning. The coverage of KVKs under different agro-climatic zones is given in Table 1.5

**Table 1.5: Agro-climatic Zones in ATARI, Pune**

State	Agro-climatic Zones (ACZ)	Name of KVK	No.of KVK
Maharashtra	Western Plateau and Hills Region	Ahmednagar-I, Ahmednagar-II, Akola, Amravati-I, Amravati II, Aurangabad-I, Aurangabad-II, Beed-I, Beed II, Buldhana-I, Buldhana-II, Chandrapur, Dhule, Hingoli, Jalgaon-I, Jalgaon-II, Jalna-I, Jalna-II, Latur, Nagpur-I, Nagpur-II, Nanded-I, Nanded-II, Nandurbar, Nashik-I, Nashik-II, Osmanabad, Parbhani, Pune-I, Pune-II, Sangli I, Sangli II, Satara-I, Satara-II, Solapur-I, Solapur II, Wardha, Washim, Yavatmal-I, Yavatmal-II	40

State	Agro-climatic Zones (ACZ)	Name of KVK	No. of KVK
	West Coast Plains and Ghat Region	Kolhapur-I, Kolhapur-II, Palghar, Raigad, Ratnagiri, Sindhudurg, Thane	7
	Eastern plateau and hills region	Bhandara, Gadchiroli, Gondia	3
Gujarat	Gujarat Plains And Hills Region	Amreli, Anand, Banaskantha-I, Banaskantha-II, Bharuch, Bhavnagar, Dahod, Dang, Gandhinagar, Jamnagar, Junagadh, Kheda, Kutch-I, Kutch-II, Mehsana, Morbi, Narmada, Navsari, Panchmahal, Patan, Porbandar, Rajkot-I, Rajkot-II, Sabarkantha, Surat, Surendranagar, Tapi, Vadodara, Valsad	29
	Coastal Plains and Hills	Ahmedabad	1
Goa	Western Coast Plains and Ghat region	North Goa, South Goa	2
Total			82

## Special Attainments

### State Level Annual Virtual Action Plan Workshop of 51 KVKs of Maharashtra and Goa

The ICAR-Agricultural Technology Application Research Institute, Pune, Maharashtra and Krishi Vigyan Kendra, Aurangabad - I, Vasantnaik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra jointly organized the "State Level Virtual Annual Action Plan Workshop of 51 KVKs of Maharashtra and Goa" from 9<sup>th</sup> to 10<sup>th</sup> February, 2021. In his inaugural address, Dr. Ashok Kumar Singh, Deputy Director General (Agricultural Extension), ICAR urged to build the KVK as a model campus for enabling the people to learn many things without narrating anything. He stressed that the KVK should be futuristic in its action plan. Identifying the commodities for market access and areas of working and cluster of KVKs for water scarcity areas, intensified seed production, quality nursery and protected cultivation were some of the main points of the DDG's address. Dr. Singh emphasized focusing on groundwater recharge activities. DDG stated that the KVK should have connections with the FPOs, Banks, Agricultural Universities, ICAR Institutes and other agencies. Dr. V.P. Chahal, ADG (Agricultural Extension), ICAR urged on increasing the productivity of oilseed and pulses through cluster frontline demonstrations.

Dr. Randhir Singh, ADG (Agricultural Extension), ICAR emphasized cluster-based FPOs, value-chain management, entrepreneurship development and one

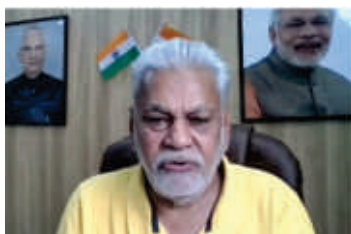


district-one commodity concept. Dr. Ashok Dhawan, Vice-Chancellor, Vasantnaik Marathwada Krishi Vidyapeeth, Parbhani, Maharashtra stressed on beautification of the KVK campus for satisfying the visiting farmers and providing them with useful technologies. He urged the KVKs to start input production units like seeds, biofertilizers, quality bio-pesticides, seedlings, trichocard, etc. Dr. V.M. Bhale, Vice-Chancellor, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra regarded the KVK as the only media for transferring the technology to the farmers. He stated that the KVK is a hub for farm technologies. He emphasized the usefulness of Custom Hiring Services for costly farm implements/machinery. Dr. S.D. Sawant, Vice-Chancellor, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli, Maharashtra outlined the initiative of KVK, Ratnagiri for starting an innovative unit of Fresh Cashew Nut Processing to provide good quality cashew nuts.

Dr. Lakhan Singh, Director, ICAR-Agricultural Technology Application Research Institute, Pune, Maharashtra urged the KVKs to address burning issues like PBW in cotton, FAW in maize, white grub in sugarcane, dieback and gummosis in sweet orange, etc. He emphasized that the farmers can use the border of the farms for cultivating drumstick, custard apple, jamun, tamarind, karonda for attaining additional income. The senior officials of ICAR Institutes and State Agricultural Universities also provided their valuable inputs for improving the action plans of KVKs. A total of 120 participants including 51 Heads of KVKs (49 Maharashtra and 2 Goa) virtually participated and presented their annual action plan for the year 2021.

### Shri Parshottam Rupala inaugurates National Webinar on “Bhumi Suposhan and Sanrakshan”

The ICAR-Agricultural Technology Application Research Institute, Pune, Maharashtra and Akshay Krishi Parivar, New Delhi jointly organized a National Webinar on “Bhumi Suposhan and Sanrakshan” on 15th April 2021.



The Chief Guest, Shri Parshottam Rupala, Union Minister of State for Agriculture & Farmers' Welfare urged the KVKs for

sensitizing the farmers about the “Bhumi Suposhan and Sanrakshan”. Regarding soil erosion as a serious issue, the Minister accentuated that without enriching and conserving soil, a higher yield on a sustainable basis cannot be obtained. The recycling of organic waste, “Har Med Par Ped”, organic farming, use of bio-pesticides, indigenous cow husbandry, etc., were focused on in the Minister's address.



Dr. Trilochan Mohapatra, Secretary (DARE) and Director General (ICAR) expressed his concerns about the soil health

deterioration, losing upper layer of productive soil and excess use of fertilizers. The Director General also stressed on integrated farming, doubling farmers' income while maintaining soil health, soil fertility

management, biological farming and less use of chemicals. Dr. Mohapatra urged the KVKs for organizing more awareness programmes involving the other organizations and NGOs.

Dr. Ashok Kumar Singh, Deputy Director General (Agricultural Extension), ICAR urged for protecting the fertile soil,



ensuring balanced use of fertilizers, organic farming, integrating animal husbandry component in crop husbandry, keeping soil alive, protecting soil biodiversity and adopting soil conservation measures. The DDG regarded the use of neem coated urea as useful.

Shri Ajit Kelkar, Member, Bhumi Suposhan Rashtriya Abhiyan highlighted the importance of organic carbon and



micro-organisms in building soil health. He stressed on avoiding more tillage, mono-cropping, fertilizer-centric approach and higher use of herbicides.

Dr. N.H. Kelawala, Vice-Chancellor, Kamdhenu University, Gandhinagar urged for taking the ownership to maintain soil health. He emphasized on the cows' ability to sustain in high temperature throughout the country.

Dr. Vallabhkhair Kathiria, former Chairman, Rashtriya Kamdhenu Aayog urged the KVKs for joining the “Jan Jagran Abhiyan on Bhumi Suposhan and Sanrakshan” at the national level. He stressed on the helpfulness of Cow-based economy for sustainable agriculture and livelihood security.

Dr. Lakhan Singh, Director, ICAR-ATARI, Pune, Maharashtra emphasized on identifying the Motivators or Bhumi Rakshak for protecting the soil and making livestock as an integral part of farming. Around 11 ICAR-ATARI Directors, Directors of Extension Education of State Agricultural Universities and Heads & Scientists of Krishi Vigyan Kendras also virtually participated in the Webinar. In total 780 participants representing 722 KVKs across the country participated in the program in virtual mode.



## Annual Action Plan Workshop of Gujarat KVKs

The ICAR-Agricultural Technology Application Research Institute, Pune, Maharashtra and Krishi Vigyan Kendra, Navsari Agricultural University, Navsari, Gujarat jointly organized the “State Level Virtual Annual Action Plan Workshop of 30 KVKs of Gujarat” on 18<sup>th</sup> February, 2021.



In his inaugural address, Dr. Ashok Kumar Singh, Deputy Director General (Agricultural Extension), ICAR regarded the Farmers' Producers' Organizations (FPOs) as the smaller version of cooperative societies. He urged the KVK to work as Cluster Based Business Organization (CBBO) for Farmers' Producers' Organizations. Dr. Singh stressed on using handheld devices for soil testing and looking into the experiment system. He also emphasized on giving more thrust on oilseeds and pulses, bio-fortified varieties, nutri-gardens, quality nursery, soil health and organic farming. The DDG stated that the Bio-Kisan Hubs may be developed involving 2 to 3 KVKs.

Dr. V.P. Chahal, ADG (Agricultural Extension), ICAR emphasized that the KVKs should be visionary in developing the work plan. He stressed on building-up the convergence with different agencies to obtain technological and financial support. Dr. Z.P. Patel, Vice-Chancellor, Navsari Agricultural University, Navsari, Gujarat urged the KVKs for creating the marketing of organic products of farmers for higher profits. He suggested the KVKs to link the culture, taboos and festivals with farming practices to percolate in the tribal villages. Dr. V.P. Chovatia, Vice-Chancellor, Junagadh Agricultural University,

Junagadh, Gujarat emphasized on post-harvest processing, value-addition, food safety standards and market intelligence to have a better export market. Dr. R.M. Chauhan, Vice-Chancellor, Sardarkrushinagar Dantiwada Agricultural University, Gujarat accentuated on promoting the hi-tech models for enhancing the farmers' income.

Dr. Lakhan Singh, Director, ICAR-ATARI, Pune, Maharashtra urged the KVKs experts to be vigilant to predict and follow alternate strategies amidst the coming up of various new diseases pests in fruits and vegetables due to climate change. A total of 75 participants virtually attended the workshop.

## Virtual Orientation Training Programme for Newly Recruited Subject Matter Specialists of KVKs

The ICAR-Agricultural Technology Application Research Institute, Pune, Maharashtra and Anand Agricultural University, Anand, Gujarat jointly organized a “Virtual Orientation Training Programme for Newly Recruited Subject Matter Specialists of KVKs” for Maharashtra, Gujarat and Goa from 3<sup>rd</sup> to 5<sup>th</sup> May, 2021.

The chief guest, Dr. Ashok Kumar Singh, Deputy Director General (Agricultural Extension), ICAR urged the newly joined SMSs to be fully equipped with all sorts of available information and technologies. He highlighted the importance of economics-oriented activities and its linkage with proper marketing channels for higher profits. DDG stressed that the demonstration of the technologies and their up-scaling to full potential should go parallel. Dr. Singh emphasized on the need for adopting the diversification in the area for reducing the risk of sole crop production and securing the livelihood of farmers.







Dr. K.B. Kathiria, Vice-Chancellor, Anand Agricultural University, Anand, Gujarat encouraged the SMSs of KVKs for updating their knowledge and working more closely with the Agricultural Universities for new released varieties and technologies. Dr. Kathiria emphasized on popularizing the useful technologies to the end users. Dr. Randhir Singh, Assistant Director General (Agricultural Extension), ICAR urged the KVKs for orienting the SMSs to take new responsibilities with effective implementation at farmers' fields. Dr. Singh also accentuated on fully orienting the newly recruited SMSs to work in collaboration with the other disciplines and making the KVK more vibrant in the district as the highest ranking Agricultural Institution. Dr. K.D. Kokate, former Deputy Director General (Agricultural Extension), ICAR highlighted the contribution of agriculture in the economy. He urged the SMSs for developing their skills in agriculture and allied sectors.

In his valedictory address, Dr. V.M. Bhale, Vice-Chancellor, PDKV, Akola, Maharashtra advised the SMSs for working on the line of developing strategies for doubling the farmers' income and securing their livelihoods. Dr. Bhale emphasized on reducing the yield gaps in the various crops. Dr. Lakhan Singh, Director, ICAR-ATARI, Pune, Maharashtra outlined the overview and the need of the training programme for the newly recruited SMSs. Dr. Singh urged the KVK Scientists for having in-depth knowledge of technology, ability of working as coworkers, creating instructional farms as a model, vigilant on disease / pest outbreaks, etc.

The senior officials of ICAR and its Institutes along with the State Agricultural Universities also virtually participated in the programme.

## Virtual Annual Zonal Review Workshop under Gramin Krishi Mausam Sewa Project

The ICAR-Agricultural Technology Application Research Institute, Pune, Maharashtra and the Indian Meteorological Department, New Delhi jointly organized the "Virtual Zonal Review Workshop of DAMU-KVKs" on 29<sup>th</sup> July 2021.

In his inaugural address, Dr. P.G. Patil, Vice-Chancellor, MPKV, Rahuri, Maharashtra underlined the effectiveness of the Institutional network created under the GKMS and District Agro-Meteorology Unit (DAMU) project for providing the agromet services and weather advisories to farmers. Dr. Patil also released the Publications of the KVK, Nandurbar during the occasion.



The Guest of Honor, Dr. Randhir Singh, ADG (Agricultural Extension), ICAR applauded the IMD's key role for providing the weather forecast and real time advisories to the farmers through KVKs under the DAMU Project. Dr. Singh urged the DAMU KVKs for assessing the use of advisories and document the success stories under the project.

Dr. K.K. Singh, Head, Agromet, IMD, New Delhi highlighted the KVK Heads' role for acting as the mentors and building capabilities of the DAMU Staff specifically placed at DAMU centres under the

Scheme. Dr. D.S. Pai, Head, Climate and Research Services, IMD, Pune, Maharashtra underlined the usefulness and impact of Agromet Advisories being disseminated by the KVKs under the DAMU Project. He stated about the usefulness of the advisories like lightening forecast for the livestock owners.

Dr. Lakhan Singh, Director, ICAR-ATARI, Pune, Maharashtra urged the KVKs for integrating the crop information with the meteorological data for quality weather forecast advisory. All the Phase-I and Phase-II KVKs from Maharashtra, Gujarat and Goa participated in the Workshop.

### Virtual 4<sup>th</sup> Annual Zonal Workshop of KVKs of Maharashtra, Gujarat and Goa

The ICAR-Agricultural Technology Application Research Institute, Zone-VIII, Pune, Maharashtra has virtually organized the “4th Annual Zonal Review Workshop of 82 Krishi Vigyan Kendras” from 4<sup>th</sup> to 6<sup>th</sup> August, 2021.

The Chief Guest, Dr. Ashok Kumar Singh, Deputy Director General (Agricultural Extension), ICAR urged to add atleast one enterprise along with the existing cropping system for doubling the farmers' income. He also suggested the KVKs for focusing on changing the cropping pattern and nutrition security. The DDG stressed on encouraging the Agripreneurs to focus on processing and value-addition, FPOs as aggregation model, entrepreneurship development, enhancing water use efficiency, diagnostic facilities and nutrition mapping.

Dr. V.M. Bhale, Vice-Chancellor, Punjabrao Deshmukh Krishi Vidyapeeth, Akola, Maharashtra underlined the prevalence of large scale pests on crops and the campaign carried out in an integrated

way. He stressed on the need for diverting some areas for oilseeds in view of the shortfall in oilseed production.

Adrushya Kadsiddheshwar Swami Ji, Chairman, KVK, Kolhapur, Maharashtra emphasized on the need for enhancing the dialogue between farm scientists and farmers and exchange of experiences. He stressed on minimizing the loss of food from harvest to meal. Shri Atul Jain, General Secretary, Deendayal Research Institute, New Delhi highlighted the need of confluence of traditional knowledge and modern agricultural knowledge.

The Special Guest, Shri Rajendra Pawar, President, Agriculture Development Trust, Baramati, discussed about the high-tech cultivation of vegetables and grafting, developing ideal dairy farm, disease diagnostic and advisory. Shri Vijay Anna Borade, President, Marathwada Agricultural Assistance Board, KVK, Jalna, Maharashtra highlighted the importance of using the high technology and organic farming to double the production of farmers. Dr. Z.P. Patel, Vice-Chancellor, Navsari Agricultural University, Navsari, outlined the various innovative researches in the biological component of the University. He stressed on the need of better marketing, raising sweet corn, dragon fruit and minor millets.

Dr. Lakhan Singh, Director, ICAR-ATARI, Pune, Maharashtra briefed about the various projects of the State and the Central Government being initiated through the KVKs and their progress. The different Nutritional Garden Models developed by the KVKs for making Kuposhan Mukta villages was also emphasized in Dr. Lakhan's address. More than 280 participants from 82 KVKs, ICAR Institutes, State Agricultural Universities, Heads of NGOs and Farmers virtually participated in the Workshop.





## State Level Review Workshop on “Cluster Frontline Demonstrations for Oilseeds and Pulses”

The ICAR-Agricultural Technology Application Research Institute, Pune, Maharashtra and Krishi Vigyan Kendra, Goa jointly organized the two-day State Level Review-cum-Sensitization Workshop on “Cluster Front Line Demonstration on Oilseeds and Pulses” for 47 KVKs of Maharashtra from 18<sup>th</sup> to 19<sup>th</sup> November, 2021.

In his inaugural address, Dr. V.P. Chahal, ADG (Agricultural Extension), ICAR urged the KVKs for focusing on processing and value-addition of oilseeds and pulses, biofortified varieties, nutrition security, enhancing the farmers' income and reducing the dependence on imports. Dr. Chahal regarded the

KVKs as backbone of Agricultural Extension and Oilseeds & Pulses as the priority areas for the KVKs.

Dr. Parveen Kumar, Director, ICAR-CCARI, Goa underlined the increase in pulses and oilseeds production by 3.7 MT and 5.56 MT respectively as compared to the last year. Dr. Kumar accentuated on the promotion of the pulses and oilseed crops in Goa state also. Dr. Lakhan Singh, Director, ICAR-ATARI, Pune emphasized on enhancing the productivity and profitability of oilseeds and pulses. He also advised the KVKs for promoting the climate-resilient technologies like BBF, improved varieties and farm mechanization, etc. Earlier, Dr. H.R.C. Prabhu, Head, KVK, North Goa delivered the welcome address. More than 60 Scientists from the different ICAR Institutes, 4 State Agricultural Universities and 47 KVKs participated in the Workshop.



## Ongoing Research Projects

### Project: Impact of climate resilient technology interventions implemented through NICRA across different agro-ecological regions of India

Lead Centre of the Project: ICAR-ATARI Hyderabad  
Co-PI from ATARI Pune- Dr Lakhan Singh, Director  
Scientist associated- Tushar Athare, Scientist (Agril Extension)

Total three KVKs i.e. Jalna-I, Nandurbar and Banaskantha-I are involved from ICAR-ATARI Pune. Under this project 2 NICRA villages and 2 non-NICRA villages are selected. 20 respondents are selected from each village so that data of 80 respondents is collected from NICRA and non-NICRA village. Currently data is collected at the KVK level.

### Project: Impact Assessment of Selected Interventions by KVK under Doubling Farmers Income for Enhancing Farmers' Income

Lead Centre of the Project: ICAR-ATARI Jodhpur  
Co-PI from ATARI Pune- Dr Lakhan Singh, Director  
Scientist associated- Tushar Athare, Scientist (Agril Extension)

Total 21 KVKs i.e. Aurangabad-I, Osmanabad, Pune-I, Gadchiroli, Nandurbar, Nagpur-I, Raigad, Latur, Pune-II, Jalna-I, Amravati-II, Solapur-I, Dhule, Mehasana, Valsad, Banaskantha-I, Rajkot-I, Bhavnagar, Kutch-I, Navsari and Anand are involved from ICAR-ATARI Pune in this project. 2 DFI Villages and 2 Non DFI Villages are selected for data collection. 20 respondents are selected from each village for data collection. Data of 80 respondents per KVK is being collected.

### **3. Project Name: Network project on analysis of agricultural programmes conducted in Aspirational Districts in India**

Lead Centre of the Project: ICAR-ATARI Kolkata

Co-PI from ATARI Pune- Dr Lakhan Singh, Director

Scientist associated- Tushar Athare, Scientist (Agril Extension)

Two KVKs Nandurbar from Maharashtra and Narmada from Gujarat are selected under this research project from ICAR-ATARI Pune. The major focus of the project is to quantify the impact of various agricultural programmes conducted in aspirational districts. The data is being collected from respondents.

### **4. Project Name: Impact of technological interventions of KVKs on socio-economic empowerment and sustainable livelihood security of tribal farmers**

Lead Centre of the Project: ICAR-ATARI Guwahati

Co-PI from ATARI Pune- Dr Lakhan Singh, Director

Scientist associated- Tushar Athare, Scientist (Agril Extension)

Total 11 KVKs i.e. Nashik I, Amravati I, Raigad, Palghar, Nandurbar, Narmada, Valsad, Dahod, Tapi Bharuch and Dang are involved from ICAR-ATARI Pune. One adopted and one non-adopted village is selected from each KVK for data collection, whereas 20 respondents are selected from each village totalling to 40 respondents per KVK.

### **5. Project Name: Gender and Nutrition Mega Project “Assessing dietary diversity, consumption pattern and nutritional security in Nutri-SMART Villages- A step towards vocal for local”**

Lead Centre of the Project: ICAR-ATARI Guwahati

Co-PI from ATARI Pune- Dr Lakhan Singh, Director

Scientist associated- Dr Rajesh T., Scientist (Agril Economics)

Total 36 KVKs of ATARI Pune out of which 29 are from Maharashtra, 06 from Gujarat and 01 from Goa are selected for this research project. One Nutrismart village and one Control village from each KVK for the study are selected. The major focus of the project is

data collection and to study the difference in behavioural pattern between Nutrismart and Control village in first phase of study and to evaluate the difference in behavioural change in second phase of study after imparting training on preparation of nutri-rich food, nutrition literature distribution and awareness of women from selected households about nutrition in the nutrismart villages.

### **6. Project Name: Impact of ARYA on promotion of agripreneurship and alternative livelihoods**

Lead Centre of the Project: ICAR-ATARI Guwahati

Co-PI from ATARI Pune- Dr. Lakhan Singh, Director and Dr Rajesh T., Scientist (Agril Economics)

Total 12 KVKs i.e. Anand, Kheda, Amreli, Rajkot I, Navsari, Bhavnagar, Nagpur I, Pune II, Solapur I, Washim, Osmanabad and Nashik-I involved from ICAR-ATARI Pune. This project was started with the goal of motivating the unemployed rural youth with skill and associated support to work in on and off farm enterprises. The achievements of the project have been assessed against different parameters like increased number of participants, average seasonal/ yearly income, additional manpower creation and support of various organizations towards entrepreneurship development.

### **7. Project Name: Impact assessment of popular pulses varieties and technologies disseminated by KVKs through Cluster frontline demonstration of pulses (CFLD-P) in India**

Lead Centre of the Project: ICAR-ATARI Kanpur

Co-PI from ATARI Pune- Dr Lakhan Singh, Director

Scientist associated- Dr Rajesh T., Scientist (Agril Economics)

Finalization of the sampling plan for selection of identified Agro-ecological zone and districts for impact assessment of popular pulses varieties and technologies disseminated by KVKs through CFLD pulses was done. During 2021, finalization of the interview schedule was done. After the finalization of location for study, secondary data on the production in chickpea, pigeon pea, green gram and black gram on time series basis for Maharashtra and Gujarat was collected.

# Technology Assessment Through On Farm Trials

## Chapter 2

### Technology Assessment

On-farm testing (OFT) is an important mandate of Krishi Vigyan Kendra. During the year, in Zone VIII total 613 technologies assessed & 6479 trials conducted at different locations on farmers' fields (Table 2.1) through On-farm Trials (OFT). The technologies included 428 on crops, 97 technologies on livestock and fishery and 88 technologies on other enterprises.

KVKs of Maharashtra, Gujarat and Goa assessed 444, 162 and 7 technologies in 5329, 1110 and 40 trials, respectively. A total 428 technologies were on crops of which 112 were Varietal Evaluation, 67 technologies on Integrated Pest Management and 83 on INM. Out of 97 technologies assessed in livestock and fishery, 51 were on nutrition management, 20 productions and management and 14 on evaluation of Breeds. Drudgery reduction and value addition were the other themes wherein 5 and 2 technologies were assessed, respectively.

**Table 2.1 Summary of OFTs conducted by KVKs**

Sr. No.	Thematic Areas	No. of Technologies	No. of Trials
<b>Maharashtra</b>			
1	Crops	293	3491
2	Livestock & Fishery	79	918
3	Other enterprises	72	920
	<b>Total</b>	<b>444</b>	<b>5329</b>
<b>Gujarat</b>			
1	Crops	128	831
2	Livestock & Fishery	18	181
3	Other enterprises	16	98
	<b>Total</b>	<b>162</b>	<b>1110</b>
<b>Goa</b>			
1	Crops	7	40
	<b>Grand Total</b>	<b>613</b>	<b>6479</b>

### Technology Assessment under Crops

In Zone, KVKs of Maharashtra, Gujarat and Goa organized on farm trials in 16 major thematic areas. In all, 428 technologies were tested involving 4362 farmers. In Maharashtra, 293 technologies were assessed with active participation of 3491 farmers. In Gujarat, 128 technologies were experimented with involvement of 831 farmers. While in Goa 7 technologies were tested involving 40 farmers (Table

2.3). Integrated nutrient management, integrated pest management, integrated disease management, integrated crop management, weed management, varietal evaluation, resource conservation technologies, drudgery reduction, farm machinery, cropping system, post-harvest management etc. related to crop production were taken up for assessment. Cereals, pulses, oilseeds, vegetables, fruits, cash crops etc. were covered under different thematic areas. State wise technologies tested under different components are given in Table 2.3.



**Table 2.2 Thematic area wise technology assessment under crops**

Sr. No.	Thematic Areas	No. of Technologies	No. of Trials
1	Cropping System	9	102
2	Drudgery Reduction	5	64
3	Farm Machinery	27	281
4	Integrated Crop Management	45	538
5	Integrated Disease Management	23	177
6	Integrated Nutrient Management	83	889
7	Integrated Pest and Disease Management	19	175
8	Integrated pest Management	67	845
9	Nutritional Security	4	46
10	Processing and Value Addition	2	12
11	Resource Conservation Technology	8	76
12	Storage Technique	3	25
13	Varietal Evaluation	112	963
14	Weed Management	13	127
15	Integrated Farming Systems	5	24
16	Seed / Planting Material production	3	18
	<b>Total</b>	<b>428</b>	<b>4362</b>

**Table 2.3 State wise technology assessment**

Sr.No	Thematic Area	Maharashtra		Gujarat		Goa	
		Techno. (No.)	Trials (No.)	Techno. (No.)	Trials (No.)	Techno. (No.)	Trials (No.)
1	Cropping System	8	98	1	4	0	0
2	Drudgery Reduction	4	59	1	5	0	0
3	Farm Machinery	25	273	2	8	0	0
4	Integrated Crop Management	35	451	10	87	0	0
5	Integrated Disease Management	13	127	10	50	0	0
6	Integrated Nutrient Management	52	650	31	239	0	0
7	Integrated Pest and Disease Management	16	162	3	13	0	0
8	Integrated pest Management	46	713	21	132	0	0
9	Nutritional Security	2	26	2	20	0	0
10	Processing and Value Addition	2	12	0	0	0	0
11	Resource Conservation Technology	6	67	2	9	0	0
12	Storage Technique	1	15	2	10	0	0
13	Varietal Evaluation	67	688	38	235	7	40
14	Weed Management	12	122	1	5	0	0
15	Integrated Farming Systems	1	10	4	14	0	0
16	Seed / Planting Material production	3	18	0	0	0	0
	<b>Total</b>	<b>293</b>	<b>3491</b>	<b>128</b>	<b>831</b>	<b>7</b>	<b>40</b>

## Assessment of Livestock & Fishery Technologies

In Zone VIII, KVKs assessed 97 technologies on 4 thematic areas related to livestock and fishery

components including disease management (12); evaluation of breeds (14); nutrition management (51) and production & management (20) through 1099 on farm trials (Table 2.4).

**Table 2.4 Thematic area wise technology assessment under livestock and fishery**

Sr. No	Thematic Areas	No. of Technologies	No. of Trials
1	Disease Management	12	181
2	Evaluation of Breeds	14	128
3	Nutrition Management	51	573
4	Production and Management	20	217
	<b>Total</b>	<b>97</b>	<b>1099</b>

From Table 2.5, it could be observed that 79 technologies in livestock, poultry and fishery sectors were assessed through 918 trials in Maharashtra

followed by 18 technologies assessed through 181 trials in Gujarat.

**Table 2.5 Livestock and fishery technologies assessment: State-wise**

Sr.No	Thematic Area	Maharashtra		Gujarat		Total	
		Techno. (No.)	Trials (No.)	Techno. (No.)	Trials (No.)	Techno. (No.)	Trials (No.)
1	Disease Management	9	136	3	45	12	181
2	Evaluation of Breeds	14	128	0	0	14	128
3	Nutrition Management	39	462	12	111	51	573
4	Production and Management	17	192	3	25	20	217
	<b>Total</b>	<b>79</b>	<b>918</b>	<b>18</b>	<b>181</b>	<b>97</b>	<b>1099</b>

## 1. Results of Selected On Farm Trials: Maharashtra

### I: Varietal On-Farm Experiments

#### 1. Assessment of different varieties of soybean: KVK Latur

Soybean is an important *kharif* oilseed crop grown in Maharashtra. KVK Latur conducted on farm trial to ascertain the different improved varieties MAUS-612 and MAUS-158 of soybean with JS-335 at farmers' fields. Result indicated that variety MAUS-612 performed well in the area and gave an average yield of 21.40 q/ha which was higher (31.69 per cent) over the existing variety JS-335 and 8.08 per cent more yield on MAUS-158 cultivar. The net return of Rs.1, 05,550 /ha was obtained by the farmers which were higher than the local check.



Technology Assessed		Yield (q/ha)	No. of Pods/plant	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers Practice Local Variety-JS-335	16.25	28.71	70000	2.60
T <sub>2</sub>	Improved variety- MAUS-612	21.40	36.94	105550	3.38
T <sub>3</sub>	Improved variety- MAUS-158	19.80	30.83	94350	3.13

## 2. Assessment of improved variety PKV Sardar & NIAW-1994 (Phule Samadhan) in medium to deep black soils: KVK Solapur I

KVK Solapur conducted an on-farm trial on improved variety NIAW-1994 (Samadhan) & PKV Sardar in medium to deep black soils of Barshi Tahsil on 16 farmer's fields at village Dhorale. Improved wheat variety Phule Samadhan was assessed along with Azatobacter & PSB seed treatment @ 25 grams/kg for better crop stand. A yield was increase of 43.24 per cent over the farmer practice.



Technology Assessed		Germination (%)	Productive tillers /hill	Panicle length (cm)	No. of grains per panicle	Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers Practice: Local variety HD-2189	82	8	9.75	26	18.50	35,430	3.16
T <sub>2</sub>	Improved variety PKV Sardar	85	10	12.60	29	21.75	42,050	3.23
T <sub>3</sub>	Improved variety Phule Samadhan	93	13	15.30	38	26.50	55,350	3.93

## 3. Performance of Pigeonpea Var. Godavari with BDN- 711: KVK Beed-II

Pigeon pea is the major pulse crop grown across the zone during the *kharif* season. It is being promoted as a climate resilient crop in the Marathwada region of Maharashtra under rainfed conditions. Keeping this in view, KVK Beed has assessed two varieties of pigeon pea viz.,BDN-711, BDN-2013-41 (Godawari) along with farmers' local variety Khadaka for their suitability in rainfed conditions. Results indicated that BDN-2013-41 (Godawari) was the best in Beed district with a yield of 22.00 q/ha.



Technology Options		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers Practice: Local variety (Khadaka)	12.50	48750	1.61
T <sub>2</sub>	Improved variety BDN-711	18.00	76400	2.00
T <sub>3</sub>	Improved variety BDN-2013-41(Godawari )	22.00	101100	2.60



#### 4. Assessment of Phule Chetak variety of Greengram with Vaibhav: KVK Dhule

KVK Dhule conducted on-farm trial on a newly released variety Phule Chetak of Green Gram to identify suitable high-yielding varieties for better yield with disease resistance in farmer's fields. The varieties tested were Phule chetak and BM 2003-2 compared to farmer practise (Vaibhav) as controls. The findings revealed that Phule Chetak performed better and increased the yield by 20 to 50 per cent as compared to BM2003-2 and Vaibhav. The variety Phule Chetak gave the highest yield of 7.5 q per hectare, resulting in a net return of Rs. 26,430/- and a BCR of 3.5



Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers practice: Predominant variety Vaibhav	5.0	13570	2.51
T <sub>2</sub>	Improved variety Cv. BM-2003-2	6.0	21180	3.05
T <sub>3</sub>	Newly released variety (Phule Chetak)	7.5	26430	3.56

#### 5. Assessment on high yielding hybrids variety of Chilli for improvement of yield : KVK Akola

KVK Akola assessed three different hybrid varieties, viz. Arka Meghana, Arka Swetha and Kashi Ratna of green chilli with farmers' practice (Syngenta) under irrigated conditions. Results revealed that Arka Swetha yielded a maximum of 249.00 q/ha followed by Arka meghana (240.43 q/ha) and Kashi Ratna 205.29 q/ha as compared to farmer practices Syngenta (195.86 q/ha) in Akola district.



Technology Assessed		Yield (q/ha)	Spread (cm)	Height (cm)	No.of pickings	Net Income (Rs/ha)	B:C ratio
T <sub>1</sub>	Farmer Practice Local variety 1041 (Syngenta)	195.86	63.74	91.24	8	267214	3.14
T <sub>2</sub>	Improved variety-Arka Meghana	240.43	72.43	81.8	10	349857	3.67
T <sub>3</sub>	Improved variety-Arka Swetha	249	73.86	86.81	12	365214	3.75
T <sub>4</sub>	Improved variety-Kashi Ratna	205.29	72.86	82.74	9	282571	3.2

## 6. Assessment on Okra cv. Phule Vimukta: KVK Jalgaon-I

Okra is highly remunerative vegetable crop. KVK Jalgaon conducted on farm trial to assess the performance of phule vimukta and arka anamika against local variety which is giving low yield in district due to high disease incidence. The result indicated that Phule Vimukta gave highest yield 145 q/ha followed by arka anamika and local variety which gave 127 q/ha and 89 q/ha respectively.



Technology Assessed		Yield (q/ha)	No of Pickings	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers Practice: Conventional Variety/ Private	89.00	11	61000	3.17
T <sub>2</sub>	Improved variety-Phule Vimukta	145.00	16	118250	5.42
T <sub>3</sub>	Improved variety-Arka Anamika	127.50	15	100300	4.68

## 7. Assessment of Short duration and high yielding variety of Turmeric: KVK Amravati-II

In the district, most of the farmers grow turmeric crops but farmers of the district are growing Selum since long time. To find out the alternative of the variety, performance of two short-duration varieties of turmeric viz. IISR Pragati and Waigaon were assessed. In the location IISR Pragati and Waigaon performed well with a yield of fresh rhizomes 239.00 q/ha and 243.50 q/ha as compared to farmers' practices of 231.80 q/ha.



Technology Assessed		Yield of fresh Rhizomes q/ha	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers Practice: Local Variety Selum	231.80	244525	2.58
T <sub>2</sub>	Improved variety-IISR-Pragati	239.00	258837	2.63
T <sub>3</sub>	Improved variety-PDKV Waigaon	243.50	272914	2.74

## 8. Performance of Finger millet variety for rainfed situations: KVK Palghar

Farmers are using local varieties i.e. Lalnagali finger millet for cultivation. This is a late-duration variety which takes 130 to 135 days for harvesting. It is susceptible to blight disease and hence resulting in low yield. So KVK, Palghar conducted an on-farm trial on the performance of Phule Nachani and Dapoli variety which is erect and non-lodging with a duration of 115-120 days. Phule Nachani and Dapoli-2 variety recorded an average yield of 12.70 q/ha and



13.10 q/ha respectively compared to the local variety (10.50 q/ha).



Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers Practice Local variety -Lalnagali	10.50	8395	1.27
T <sub>2</sub>	Improved variety-Phule Nachani	12.70	14233	1.43
T <sub>3</sub>	Improved variety-Dapoli-2	13.10	15883	1.49

## II: Performance of ICM Technologies

### 9. Performance of different post emergence herbicide for weed management in Soybean : KVK Nagpur-I

Soybean is an important *kharif* oilseed crop grown in the majority of areas in Maharashtra but weed is one of the major problems in soybean crops. KVK Nagpur conducted the on-farm trial on 13 farmers' fields to assess the performance of post-emergence herbicides for weed management.

Results of the trials revealed that the use of imazethapyr 35 per cent and imazimox 35 @ 40g/ is effective in weed control and enhancing the yield 16.54 q/ha. The use of pendimethalin 38.7 CS @



700ml/acre gave a yield of 13.76 q/ha and the use of Quizalofop ethyl @ 400 ml/acre gave 12.66 q/ha yield.

Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers practice (Without use of herbicide)	11.5	26700	1.93
T <sub>2</sub>	Pendimethalin 38.7 CS @ 700ml/acre	13.76	34648	2.10
T <sub>3</sub>	Imazethapyr 35 % and Imazimox 35 @ 40g/acre	16.54	45892	2.36
T <sub>4</sub>	Quizalofop ethyl @ 400 ml / acre	12.66	31068	2.04

## III: Performance of INM Technologies

### 10. Assessment of feasibility of STCR equation on yield of Wheat : KVK Dhule

KVK Dhule conducted trial on feasibility of STCR equation in wheat crop with integrated nutrient management and application of recommended STCR equation in addition to RDF N: P: K 120:60:40 kg/ha. Under this intervention, average yield of 48.00 q/ha was achieved which was higher over farmer's practice and also increased net return of Rs. 30755/ha was realized by the farmers under recommended dose of fertilizers.



Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmer's practice	34	38236	2.66
T <sub>2</sub>	As per STCR equation	48	68991	3.80

## 11. Assessment of GA3 applications @ 25 ppm (13.9 g per ha) of pigeon pea: KVK Amravati-I

Pigeonpea is an important *kharif* season crop grown in the Amravati district of Maharashtra. The low productivity of pigeon peas is of great concern which is mainly attributed to imbalance or low nutrient application in pigeon peas grown in a rain-fed farming situation. KVK Amravati conducted On Farm Trials to assess GA3 application @25ppm in the district. The results of the trials indicated that GA3 application @25 ppm (13.90g/ha) resulted in the highest yield (16.24 q/ha) with a higher B:C ratio than the other treatments.



Technology Assessed		No of Pods per Plant	Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers practice (No Application)	190	14.32	53360	2.64
T <sub>2</sub>	GA3 application @ 25 ppm (13.9 g per ha)	224	16.24	66040	3.10
T <sub>3</sub>	Foliar application of 1 % Humic Acid	217	15.30	60550	2.93

## 12. Assessment off oliar spray 19:19:19 (2%) in finger millet KVK Kolhapur-II

Finger millet is a main food crop for tribal farmers of Kolhapur district and also emerged as an important nutritive cereal crop due to its high nutrient content. Thus, KVK conducted the trial on assessment the use of urea-DAP briquette techniques and pair row planting of finger millet crop. It was observed that the yield of finger millet was increased by 13.88 percent over the farmer's practice. The average yield obtained in the trial plot was 20.50 q/ha which was quite higher as compared to the local check (18.00 q/ha). The net return of Rs.40600/ha was recorded under treatment plots which were higher over the local check (Rs.32600/ha). The pair row plantation helps in aeration between the rows which helps in more shoot



development. The yield has increased due to the use of urea DAP briquettes due to the slow release of fertilizer nutrients in sloppy and high fall areas.

Technology Assessed		Yield (q/ha)	No. of tillers	Plant Height (cm)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmer's practice	18.00	4	72	32600	2.3
T <sub>2</sub>	Use of urea-DAP briquette	20.50	6	69	40600	2.6



## IV: Performance of Resource Conservation technology

### 13. Assessment of waste decomposer in soil through crop residue management: KVK Pune-II

KVK Pune conducted on-farm trials on Crop Residue Management in sugarcane crops after harvesting sugarcane through the use of a waste decomposer. The maximum production received is use of urea, SSP and decomposer ( $T_3$ ) (1625 q/ha.) followed by the use of organic decomposer in sugarcane 10 lit. /ha. ( $T_2$ ) 1410 q/ha over to control  $T_1$  (FP) (1150 q/ha.), in terms



of percentage higher than 15.25 per cent over  $T_2$  and 41.30 per cent of local check FP ( $T_1$ ).

Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
$T_1$	Farmers practice (Without spraying)	1150	167650	2.33
$T_2$	Use of Organic decomposer	1410	229250	2.76
$T_3$	Use of Urea SSP and Decomposer	1625	281875	3.13

### 14. Effect of polythene mulch on watermelon: KVK Sangli-I

KVK, Sangli laid out the assessment on the effect of polyethene black plastic mulch row covers for improving fruit yield and reducing pest and disease risk in watermelon. Trials were conducted on 12 farmers' fields. Before trials, farmers were planting watermelons on mulching paper but they were not using 20 microns of silver black plastic mulch crop cover. Due to that, more attack of pest and disease on crops was observed and required more cost for control of sucking pest. To avoid this problem, KVK conducted this trial. The average yield obtained in the trial plot was 182 q/ha which was higher as compared



to local check (152 q/ha). The net return of Rs. 112100/ha was recorded under treatment plots which was higher over the local check (Rs. 51900/ha).

Technology Assessed		No. of fruits/plant	Avg. wt. of fruit (gm)	Yield q/ha	Net Return (Rs/ha)	B:C Ratio
$T_1$	Farmers practice	2	2150	152	51900	1.56
$T_2$	Polythene mulch with drip irrigation	5	3195	182	112100	1.97

### 15. Effect of mulching with crop cover on Muskmelon: KVK Parbhani

KVK Parbhani conducted an on-farm trial on the effect of mulching with crop cover for control of pests at an early stage under the dry land condition with mulching and covering during the summer period

(March- June). The result showed that the use of plastic mulching with covering had controlled the pest attack and enhanced the yield by 72.67 per cent as compared to farmer practice and the only use of plastic mulching yield increased by 36 percent along with a net profit of Rs. 236400/- and Rs. 108600/- per hectare respectively.

Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers practice	172	162200	2.44
T <sub>2</sub>	Use of plastic mulching	234	270800	3.13
T <sub>3</sub>	Plastic mulching with crop cover	297	398600	3.93

## V: Performance of Integrated Pest Management

### 16. Management of Mango hopper (*Amritodus atkinsoni*) with Bio-pesticide and insecticides: KVK Dhule

Dhule conducted on farm trial on management mango hopper (*Amritodus atkinsoni*) with Bio-pesticide and insecticides. Due to incidence of mango hopper blossom dropping was increased & also due to sticky mould quality was deteriorated. Mango hopper is known to cause up to 40-50 per cent yield losses. The yield in technology assessed is 100.6 q/ha and in farmers practice is 65.10 q/ha. That means yield is increased over farmers practice by 54.53 per cent.



Benefit cost ratio of technology assessed is 3.83 and farmers practice is 2.37. Final recommendation for micro level situation is the application of *Metarhizium anisopliae*.

Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers practice	65.10	30114.29	2.37
T <sub>2</sub>	Two sprays of <i>Metarhizium anisopliae</i> @ 60-80 gm/10 lit	100.6	59457.14	3.83
T <sub>3</sub>	Two sprays of Buprofezin 25 % SC - 20 ml/ 10 lit	94.40	55042.86	3.69

## VI: Performance of IDM Technologies

### 17. Management of late blight disease of tomato: KVK Kolhapur-I

Tomato is an important commercial crop of Kolhapur district. However, there is high incidence of late blight resulting in yield loss. The refined technology of tomato treatment with spraying propineb 70 WP @ 25 gm and azoxystrobin (23% SC)@10 lit water and spraying difenconazole (25 EC) @ 10 ml in 10 lit water reduced the disease incidence.



Technology Assessed		Disease incidence (%)	Yield (q/ha)	Yield Increase (%)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmer Practice	25	365	-	1,17,900	1:44
T <sub>2</sub>	Spraying of Difenconazole	16.25	405	10.96	1,73,200	1:63
T <sub>3</sub>	Spraying of Propineb & Azoxystrobin	12.26	435	19.18	2,35,300	1:81



### 18. Assessment of soil & foliar application of biocontrol agent in Grape wine: KVK Pune-II

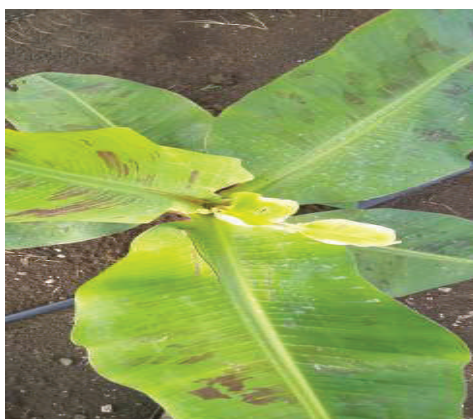
The majority of farmers experienced powdery and downy mildew incidence in grapevines and increased foliar chemical pesticide applications resulted in grapevine residual effects. To address this issue, KVK Pune conducted an OFT on the evaluation of soil and foliar applications of a biocontrol agent in grapevine. The results show that biocontrol agent soil applications out performed sulphur applications in terms of yield, increasing yield by 14.37 per cent over the farmer's practice, with a net income of Rs. 164600/- and a B: C ratio of 1.81.



Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers practice	153	462500	1.61
T <sub>2</sub>	Soil applications of biocontrol agents	175	627100	1.81

### 19. Assessment of Integrated management of Infectious Chlorosis in Banana: KVK Nanded-I

KVK Nanded has conducted the on-farm trial to assess the integrated management of Infectious Chlorosis in Banana crops during the *Kharif* season. The trials comprised T<sub>1</sub>- Farmer's practice (use chemical pesticides) T<sub>2</sub>- IDM package: Destroy infected plants, dry heat treatment of suckers at 40° C for 1 day and need to be based by spraying Dimethoate 30% EC @ 594-792 ml in 600-800 l of water/acre. The details of the result are given below in the table.



Technology Assessed		Infected plants/ ha (%)	Yield(q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers Practice	5.38	669	411900	2.27
T <sub>2</sub>	Spraying Dimethoate 30% EC @ 594-792 ml	1.15	715	471500	2.49

## VII: Performance of Livestock Management

### 20. Assessment of Post milking teat dips to reduce incidence of clinical mastitis: KVK Latur

One of the most promising programs for mastitis control is the prevention of new infections by milking hygiene. Hence KVK Latur, conducted a trial on the assessment of post-milking teat dips treatment to reduce the incidence of clinical mastitis in a cow. A





trial of the use of chemical disinfectant ( $T_2$ ) and use of herbal disinfectant ( $T_3$ ) after milking as teat dip revealed that the use of chemical disinfectant (mast

guard teat protect) ( $T_2$ ) and herbal disinfectant after milking (masitinib) ( $T_3$ ) was found superior as compared to farmers' practices ( $T_1$ ).

Technology Assessed		Milk yield (lit/animal/day)	Fat (%)	Incidence of Sub clinical mastitis (%)	Incidence of cracks, wounds on teats (%)	Net Return (Rs/ha)	B:C Ratio
$T_1$	Farmer Practices: No use of teat germicidal	11.5	3.6	60	50	34410	1.61
$T_2$	Use of chemical disinfectant (Mastiguard Teat protect)	13.3	3.8	10	10	51460	1.92
$T_3$	Use of Herbal disinfectant (Mastidip)	12.5	3.7	20	10	43090	1.76

## 21. Evaluation of fodder Hybrid Napier varieties under scientific management: KVK Nagpur I

KVK Nagpur conducted an on-farm trial on the evaluation of fodder hybrid Napier varieties under scientific management to evaluate the fodder yield among cattle in the rabi season. The results indicated that the hybrid super Napier variety gave 275.70 q/ha green forage yield higher than BNH-10 (241.60 q/ha) and CO4 (220.15 q/ha). Packchong-1 is a highly nutritional multi-cut, highly succulent and highly palatable grass among cattle. Variety Super Napier performed better followed by BNH-10 in comparison with the CO4 variety grown under farmer's practice.



Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
$T_1$	Farmer's practice: Hybrid Napier CO4	220.15	50880	2.18
$T_2$	Hybrid Super Napier (Packchong-1)	275.70	65910	2.42
$T_3$	Hybrid Napier BNH-10	241.60	57780	2.24

## 22. Assessment of perennial fodder variety Phule Gunwant for feeding and fodder: KVK Gondia

KVK Gondia conducted on farm trial on assessment of perennial fodder variety Phule Gunwant for maximum fodder production throughout the year. In this trial variety Phule Gunwant was found better over old variety Phule Yashwant due to more succulent and palatable stem, more number of leaves and also fulfilling the nutrient requirement of ruminants.



Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmer's practice: Phule Yashwant	120.00	42,082	2.63
T <sub>2</sub>	Phule Gunwant	240.00	51910	2.80

### 23. Use of bypass fat supplement in cattle feeding: KVK-Ratnagiri

The role of the bypass fat in the rations of the high-producing dairy animals is very crucial for enhancing the energy density of the ration. KVK Ratnagiri conducted on-farm trials on the assessment of bypass fat supplements on milk production in high lactating

dairy cattle. Animals were treated with Bypass fat @ 100 gm per animal per day for two months. The average milk production of animals increased by 17.89 per cent, i.e. 9.50 litre per animal per day (T<sub>1</sub>) to 11.20 litre per animal per day (T<sub>2</sub>). The net return of farmers increased from Rs. 185.00 per animal per day (T<sub>1</sub>) to Rs. 222.11 per animal per day (T<sub>2</sub>).

Technology Assessed		Milk production (lit/day/animal)	Net Return (lit/day/animal)	B:C Ratio
T <sub>1</sub>	Farmer's practice	9.50	185.00	2:85
T <sub>2</sub>	Use of bypass fat as a supplement	11.20	222.11	2:95

## Results of Selected On Farm Trials: Gujarat

### I: Varietal assessment

#### 1. Assessment of Aromatic Rice varieties KVK Anand

Rice is an important cereal crop grown in a large area of the Anand district. Farmers of the district were experiencing low productivity of old basmati rice.

KVK Anand conducted on-farm trials at farmers' fields to assess the comparative performance of new basmati rice varieties. The data of the OFT revealed that GAR 1 recorded the highest yield (56q/ha), with a B:C ratio (2.84). Number of effective tillers per hill with 15-20 days' early maturity as compared to other varieties. Vegetative growth of the plant is higher in GAR 14 than in GAR 1 and Narmada, but the number



of unfilled grains per panicle was found highest in GAR-14 than in GAR 1 and Narmada, with 8.33 per cent and 16.66 per cent increase in yield in GAR-14 and GAR 1 over Narmada, respectively.

Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmer Practices Narmada	48.00	39550	2.43
T <sub>2</sub>	GAR 1	56.00	50750	2.84
T <sub>3</sub>	GAR 14	52.00	45150	2.63

## 2. Assessment of suitable high yielding groundnut variety in *kharif* season: KVK Jamnagar

Groundnut is cultivated predominantly in the Jamnagar district. The productivity of groundnut, in Jamnagar, is low due to low yield in the existing variety, irregular rainfall and heavy incidence of pest and disease attacks. Hence, an OFT was carried out to find out suitable high yielding groundnut varieties for the *Kharif* season for the Jamnagar district to enhance groundnut productivity.

An on-farm trial was conducted during *Kharif* sowing of groundnut. GJG-32 produced a higher pod yield



(37.33 q/ha with the highest net return obtained (Rs. 169080/ha) and BCR (4.57) as compared to GG-20 and GJG-22.

Technology Assessed		Data on the parameter (q/ha)		Net Return (Rs/ha)	B:C Ratio
		Haulm yield(q/ha)	Pod yield (q/ha)		
T <sub>1</sub>	GG-20(Farmers practices)	25.67	15.83	98325	2.89
T <sub>2</sub>	GJG-22	36.00	28.67	116717	3.30
T <sub>3</sub>	GJG-32	43.44	37.33	169080	4.57

## 3. Assessment of Hybrid varieties in castor: KVK Patan

KVK, Patan conducted an on-farm trial to assess hybrid variety in castor GCH-8 and GCH-9 to increase production and productivity. GCH-8 hybrid variety of castor gave a higher yield of 33.4 q/ha while GCH-9 gave 29.6 q/ha as compared to GCH-7 (31.3 q/ha). A net return of Rs. 118740/- per ha was realized with GCH-8 while Rs. 88568/- attained under GCH-9 variety. It may be promoted in the area to increase the profitability of the farmers.



Technology Assessed		Yield (q/ha)	Net Return (Rs./ha)	B:C Ratio
T <sub>1</sub>	GCH-7(Farmer Practices)	31.3	109840	4.5
T <sub>2</sub>	GCH-8	33.4	118740	4.8
T <sub>3</sub>	GCH-9	29.6	88568	3.8

## 4. Varietal Evaluation in Black Gram: KVK Kheda

The Farmers of the Kheda district grow the black gram in the *Kharif* season. Farmers grow the Black gram of old variety which are highly susceptible to YMV and use loose seed resulting in a very low yield. OFT was conducted to assess the performance of different varieties of black gram. Treatment T<sub>4</sub> recorded the highest yield in comparison to all other treatment, T<sub>4</sub>





(Guj.Urad-3) gave 9.05 q/ha with net return (Rs. 27085) with 2.10 BC Ratio. Variety PU-31, Guj.Urad-2, Guj.Urad-3 gave 17.88, 14.57 and 19.87 per cent higher

production as compared to farmer practices (Guj Urad-1) respectively. Net profit was also higher in all the varieties.

Technology Assessed		Yield (q/ha)	Net Return (Rs./ha)	B:C Ratio
T <sub>1</sub>	Farmer Practices (Guj.Urad-1 )	7.55	19085	1.80
T <sub>2</sub>	PU-31	8.90	26230	2.07
T <sub>3</sub>	Guj.Urad-2	8.65	24805	2.01
T <sub>4</sub>	Guj.Urad-3	9.05	27085	2.10

### 5. Assessment of performance of different varieties of summer Green gram under irrigated condition: KVK Vadodra

Green gram (*Vigna radiata* L.) is commonly known as moong is an important pulse crop in India and more than 70 per cent of the world's green gram production comes from India.

KVK Vadodra conducted on farm trial for the performance of different varieties of summer Green gram under irrigated conditions. Cv.GAM-5 gave a higher yield of 12 q/ha as compared to variety Cv.GM-6 (11q/ha) and Cv.Virat (10.5 q/ha). A higher



net profit of Rs. 54800/ha was obtained in Cv.GAM-5 variety q/ha.

Technology Assessed		No. of Seed per pods	Maturity days	Yield (q/ha)	Net Return (Rs./ha)	B:C Ratio
T <sub>1</sub>	Green gram (Cv.GAM-5)	4-5	70-75	12.0	54800	3.36
T <sub>2</sub>	Green gram (Cv.GM-6)	4-5	70-75	11.0	48300	3.08
T <sub>3</sub>	Green gram (Cv.Virat/ IPM 205-7)	5-6	55-60	10.5	46000	2.94

### 6. Varietal assessment of Tomato GT-6: KVK Surendranagar

On farm trial was conducted to assess yield performance of GT-6 and GAT-5 tomato varieties with application of Beauveria-2.0 kg. Data in the table revealed that, yield of tomato was recorded maximum in recommended practices T<sub>2</sub> (271.02 q/ha) followed by T<sub>3</sub> (266.9 q/ha). Highest net return was obtained from T<sub>2</sub> (Rs. 21651/ha) followed by T<sub>3</sub> variety (Rs. 15517/ha) recommended practices.



Technology Assessed		Yield (q/ha)	Net Return (Rs./ha)	B:C Ratio
T <sub>1</sub>	Farmer Practices (Local/Private sector variety)	251.65	10023	1.78
T <sub>2</sub>	Variety: GT-6 50 gm and Beauveria-2.0 kg	271.02	21651	2.40
T <sub>3</sub>	Variety: GAT-5 50 gm and Beauveria-2.0 kg	266.9	15517	2.15



## II: Integrated Nutrient Management

### 7. Assessment of use of 0.2% boric acid and nano boron in *kharif* groundnut: KVK Kheda

The Farmers of kapadvanj taluka of kheda district grow groundnut crops in the Kharif season. Now a day deficiency of boron in emerging in soil and groundnut crops. In South Saurashtra, JAU recommends to apply three sprays of 0.2% boric acid at 30, 45 and 60 DAS in addition to the recommended dose of fertilizers for Kharif groundnut. So, keeping in view the above facts KVK Kheda decided on-farm testing of the use of boric acid in groundnut.

Under this intervention, the highest yield was



obtained in the T<sub>3</sub> intervention (17.43 q/ha) with a net return of Rs.50098/ ha. In terms of gain in net income, it is higher than farmers' practice.

Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers Practice (No use of boron)	16.65	45291	1.93
T <sub>2</sub>	RDF (12.5 - 25 - 0) and foliar spray of 0.2% boric acid at 30, 45 and 60 days after sowing	17.35	49369	2.02
T <sub>3</sub>	RDF (12.5 - 25 - 0) and foliar spray of 0.2% nano boron at 30, 45 and 60 days after sowing	17.43	50098	2.04

### 8. Effect of Jeevamratu and Panchagavya on yield of *kharif* Groundnut: KVK Kutch-II

Continuous use of inorganic fertilizers hazards the soil health in respect of the physical, chemical and biological properties of soil. Therefore, it is necessary to minimize the application of inorganic fertilizers by substituting them with organics. It is well established that the improvement of quality and productivity of the crops either food grain, oilseed or fruit crops could be made possible with the combined application of

organic manure and balanced chemical fertilizers. The contribution of organic manure is to be judged not only in terms of nutrient

contribution but also by its role in building up nutrient reserves in the soil and increasing the organic matter level of the soil which ultimately improves physical, chemical and biological properties of soil and it is more critical in the context of sustainable agriculture.

Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	(Farmers Practice) Use of 10 t. FYM + Cow urine (5 liter) + 4.5 liter Butter milk for insect and disease	21.2	80700	3.25
T <sub>2</sub>	5 t. FYM+2% Panchagavya foliar application at the time of flowering and branching stage + 500 liter Jivamrut (Soil application at the time of field preparation)	24.4	102700	3.78



### 9. INM in Banana (Assessing the Bunch Feeding in Banana): KVK Kheda

Farmers of the Kheda district grow Bananas in the *Kharif* season. In this area, farmers use different sources of nutrition to fetch maximum production of bananas but they are not used to banana bunch feeding technology, so marketable production is low in bananas. The farmers were selected from the adopted village i.e. Mahelaj at Matar Taluka of Kheda district. Farmers' meetings were organized and technical details and likely benefits of bunch feeding were discussed in detail. The result of the assessment showed that the marketable fruit yield was higher in  $T_2$  (Cow dung slurry 500 gm + Ammonium Sulphate

The experiment results revealed that application of bio-nutrients (Panchgavya and jivamrut) and time of application had a significant effect on pod and haulm yield of groundnut ( $T_2$ ) recorded higher yield (24.4 q/ha) with net return Rs. 102700 and 3.78 BC ratio followed by the treatments being farmer practices with treatments ( $T_1$ ) yield 21.2 q/ha with net return Rs.80700.00/-.



15gm+Potesium Sulphate 7.5 gm) 1265 q/ha as compared to  $T_1$  and  $T_3$ .

Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
$T_1$	Farmers Practice (No Bunch feeding)	1121	786800	8.15
$T_2$	Cow dung slurry 500 gm+Ammonium Sulphate 15gm+Potesium Sulphate 7.5 gm	1265	895600	8.69
$T_3$	Cow dung slurry 500 gm+ Urea7.5gm +Potesium Sulphate 7.5 gm	1211	852400	8.32

### 10. Assessment of response of bio fertilizers to wheat crop yield: KVK Surendranagar

Over the past few years, biofertilizers like Azotobacter, PSB, Azospirillum and liquid biofertilizers have shown a fabulous potential to improve the yield of wheat as these are eco-friendly and low-cost agriculture inputs. Managing N inputs in wheat production systems is a significant issue to attain maximum profitable production and minimum negative environmental influence.

Data in the table, revealed that the maximum grain yield was observed in  $T_3$  and  $T_2$  grain yield was increased by 7.07 and 3.38 per cent over control  $T_1$  respectively. Highter net return Rs. 40850 from  $T_3$  (75



per cent RDF+ Azotobacter & PSB (100- Kg DAP+156- Kg Urea+3.0 lit Azotobacter + 3.0 lit. PSB) over control treatment were obtained.

Technology Option		Yield (q/ha)	% Increase in yield	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	125- kg DAP & 190- Kg Urea /ha (Farmer's practice)	32.50	--	36187	2.46
T <sub>2</sub>	75 percent RDF+Azotobacter & PSB (100- Kg DAP+156- Kg Urea+3.0 lit Azotobacter + 3.0 lit. PSB)	33.60	3.38	37900	2.51
T <sub>3</sub>	75 percent RDF+Azotobacter & PSB (100- Kg DAP+156- Kg Urea+3.0 lit Azotobacter + 3.0 lit. PSB)	34.80	7.07	40850	2.67

### 11. Assessment of the use of Potassium Nitrate (KNO<sub>3</sub>) for Chickpea crop: KVK Kheda

Chickpea is gaining importance as a rabi crop in the farming community of North Saurashtra, however, economical production is hampered due to water scarcity in the region. Potassium Nitrate is known to reduce the evapotranspiration rate of crops. Hence, an on-farm trial was laid out to assess the effect of Potassium Nitrate on the yield of the crop. The fields sprayed with 2 per cent Potassium Nitrate were found superior and observed higher pod yield (12.60 q/ha) as compared to the farmer's Practice (No use of KNO<sub>3</sub>) both (T<sub>2</sub>) and (T<sub>3</sub>) gave 7.23 and 14.02 per cent higher production as compared to farmer practices (T<sub>1</sub>). But



Net returns were maximum under T<sub>2</sub> (Rs. 38250) followed by T<sub>3</sub> (Rs. 36500) and T<sub>1</sub> (Rs. 34425).

Technology Assessed		Yield(q/ha)	Net Return (Rs./ ha)	B:C Ratio
T <sub>1</sub>	Farmers Practice (No use of KNO <sub>3</sub> )	11.05	34425	2.63
T <sub>2</sub>	Seed Treatment with 100 mg/Lit. KNO <sub>3</sub> solution (8 Hours soaking)	11.85	38250	2.82
T <sub>3</sub>	2% Spray of KNO <sub>3</sub> at Flowering and Pod Development stages	12.60	36500	2.38

## III: Integrated Pest Management

### 12. Assessment of management techniques against Fall Army Worm in Maize: KVK Dahod

Farmers are frequently applying high dose of insecticides to manage FAW, which leads to residual problem and its hazardous effect spoil environment as well as human health.

IPM module gave 22.7q/ha yield with 18.2 per cent increase in yield as compared the farmer's practice.

Adoption of IPM module can minimize the damage due to fall army worm in Maize as compared to chemical method





	Technology Option	Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers practice : Propenofose 40% + Cypermethrin 4% @ 20-30 ml per 10 lit. water at 10 DAS	19.2	38320	2.08
T <sub>2</sub>	IPM module practice: Includes Pheromone trap @ 5 per ha T shaped perches @40 per ha Application of Neem oil 1500 ppm @50 ml per 10 lit. Application of Flubendiamide 20SP @10ml per 10 lit. Application of Bouveria bassiana @ 50 gm per 10 lit.	22.7	45260	2.69

### 13. Management of pigeonpea pod borer: KVK Surat

Pigeonpea (*Cajanus cajan* L.) commonly known as Red gram, Tur, Arhar is an erect and short-lived perennial shrub legume. India accounts for about 75 per cent of world production. Economically it is the second most important pulse crop after chickpea in India accounting for about 20 per cent of total pulse production. T<sub>2</sub> showed reduced pod borer and pod fly infestation and higher yield 14.72 q/ha over the farmers practice.



	Technology Assessed	Pod borer infestation (%)	Pod fly infestation (%)	Yield (q/ha)	B:C Ratio
T <sub>1</sub>	Farmers practices as injudicious and indiscriminate use of pesticides at irregular time interval	9.40	7.85	10.16	2.065
T <sub>2</sub>	Two sprays of Chlorantraniliprole 18.5% SC @ 0.006% (3 ml/10 lit of water) first at 50 per cent flowering stage and second at 50 per cent pod formation stage	2.60	4.15	14.72	2.560

### 14. Assessment of convenient method to control of Shoot and fruit borer in Okra: KVK Anand

Among various vegetables, okra, commonly known as Lady's finger is the most common and extensively grown all over the country. One of the major constraints identified in its production is the increasing incidence of insect pests and diseases. An on-farm trial was conducted on rainfed medium soils by KVK Anand. The experiment result revealed that effective control by use of recommended IPM module yield of 205 q/ha over the farmer practices yield 162 q/ha. In T<sub>2</sub> treatment IPM practices less infestation of



the shoot and fruit borer was found and 26.5 per cent yield increase observed in T<sub>2</sub>.



Technology Assessed		Yield (q/ha)	Net Return (Rs./ha)	B:C Ratio
T <sub>1</sub>	Farmers practice (Without spraying)	162	156100	3.86
T <sub>2</sub>	IPM Module (Seed treatment Imidaclopride 9ml/kg + Removal and destruction damage shoots and fruits + Pheromone Trap 60/ha, Change lure at 21 days interval+ Clontraniliprol 0.006% spray+ NSKE 5% spray 35 days after sowing +Emamectin 0.0025% + BT Powder 5wp (10g/10ltr water) +NSKE 5% spray 65 days after sowing	205	206500	4.44

## 15. Management of wilt in cumin: KVK Surendranagar

Cumin (*Cuminum cyminum* Linn.) commonly known as Jeera belongs to the *Apiaceae* family. It is native to East Mediterranean and south Asia and is grown for its pleasantly aromatic seeds. India is the largest producer of cumin. Cumin crop is mainly affected by four important diseases viz., blight (*Alternaria burns*), wilt (*Fusarium oxysporum* f. sp. *cumin*), and powdery mildew (*Erysiphe polygoni*.) Important diseases of cumin and their management to increase the yield of cumin seeds, quality and economic value respectively.

Data in the table result revealed the maximum wilt disease intensity was observed in T<sub>1</sub> i.e. 25.67 per cent. T<sub>2</sub> recorded higher yield (8.10 q/ha and 3.66 BC ratio followed T<sub>3</sub> yield 7.43 q/ha was higher as compared to farmers practice.



Significantly superior and more net return Rs. 78035 /ha and 100 per cent reduction of disease intensity was found in recommended practices of application of the *Trichoderma harzianum* (2x10<sup>6</sup> cfu/ gm) @ 5.0 kg mixed in 1000 kg of FYM/ ha at the time of sowing.

Technology Assessed		Disease Intensity (%)	% Yield increase over farmer's practice	Yield (q/h)	Net Return (Rs./ha)	B:C Ratio
T <sub>1</sub>	Farmers practice (Use of mancozeb, copper oxychloride and sulphur etc. fungicides after infestation).	25.67	-	6.83	60892	3.05
T <sub>2</sub>	Recommended practices Application of the <i>Trichoderma harzianum</i> (2x10 <sup>6</sup> cfu/ gm) @ 5.0 kg mixed in 1000 kg of FYM/ ha at the time of sowing.	0.00	18.59	8.10	78035	3.66
T <sub>3</sub>	Application of the <i>Trichoderma harzianum</i> (2x10 <sup>6</sup> cfu/ gm) @ 5.0 kg mixed in 100kg of sand/ha at the one month after germination of crop.	2.67	8.78	7.43	69392	3.38

## IV: Livestock Management

### 16. Assessment of mineral and deworming effect on anestrus condition in lactating buffalos: KVK Mehsana

KVK Mehsana conducted trial on the effect of mineral mixture supplementation and deworming on the productive, reproductive performance and economics of lactating buffalo. Use of green feed, dry feed, concentrate, chelated mineral combinations at 30 gm, copper and cobalt bolus, and deworming of animals are the recommended treatments carried out. The results indicate that deworming and mineral supplementation increased the percentage of conception by 80%.

The supplementation of area specific mineral mixture and deworming to the lactating buffaloes under field conditions not only increases the milk yield, but also reduce post-partum oestrus period, number of



A.I/service per conception, service period, cost of per liter of milk production and consequently improving socio-economic conditions. The dairy farmers to supplement the area specific mineral mixture and deworming to their animals to get more profit from dairy animal farming.

Technology Assessed		Conception (%)	No. of Animals show sign of estrus	No. of animal in heat
T <sub>1</sub>	Farmer Practices - green fodder, dry fodder, concentrate	20	4	5
T <sub>2</sub>	T <sub>1</sub> + Chelated mineral mixtures @ 30 gms + copper and cobalt bolus	50	7	7
T <sub>3</sub>	T <sub>2</sub> + Deworming of animals	80	9	9

### 17. Assessment of poultry breeds under Back yard: KVK Vadodara

Farmers have historically produced poultry in rural regions; however, raising locally / indigenously breed poultry birds has a low economic return due to poor production performance. However, with improved chicken varieties, poultry production can be easily increased and can even guarantee higher compensation for the production of meat and eggs.

KVKs Vadodara conducted trials on the assessment of improved varieties of poultry birds (Kadakhnath and Ankleshwar breed.) in the backyard. The introduction of such varieties of birds, with better management practices, resulted in a fast growth rate with an



average body weight of 20 weeks of age 1320gm (M) and 1140 gm (F) and higher egg production than local.

Technology Options		Body Weight	Egg Production	Net Return (Rs./ unit)	B:C Ratio
T <sub>1</sub>	Farmers practice - desi birds rearing under back yard.	850 (M) & 810 (F) gm to 20 weeks	34 eggs upto 40 weeks	3160	1.73

Technology Options		Body Weight	Egg Production	Net Return (Rs./ unit)	B:C Ratio
T <sub>2</sub>	Ankleshwar breed (Recom. AAU)	1290 (M) & 1050 (F)gm to 20 weeks	43 eggs upto 40 weeks	5742	2.32
T <sub>3</sub>	Kadakhnath breed	1320(M) & 1140 (F) gm to 20 weeks	48 eggs upto 40 weeks	6633	2.55

### 18. Effect of supplementing mineral mixture and concentrate on body growth performance in calves: KVK Dang

Based on the study carried out for three consecutive years it is summarized that T<sub>3</sub> – recorded better body growth performance in comparison to T<sub>1</sub> & T<sub>2</sub>. However, the body weight gain with T<sub>2</sub> was comparatively higher than T<sub>1</sub>. So it is concluded that T<sub>3</sub>: Feeding of 15 gm mineral mixture + deworming (Bol. Fenbendazole (7.5 mg/kg B. weight, oral) + Concentrate feeding @ 1% body weight proved the



best husbandry practices in the tribal area of Dangs. T<sub>3</sub> treatment is best among T<sub>1</sub> and T<sub>2</sub>.

Treatments		Yield (kg/ animal)	Net Return (Rs/animal)	B:C ratio
T <sub>1</sub>	Framer's practice (n=10)	62.8	1200	1.5
T <sub>2</sub>	Feeding of 15 gm mineral mixture + deworming (Bol. Fenbendazole (7.5 mg/kg B. weight, Oral) (n=10)	65.4	1900	1.73
T <sub>3</sub>	Feeding of 15 gm mineral mixture + deworming (Bol. Fenbendazole (7.5 mg/kg B. weight, Oral) + Concentrate feeding @ 1% body weight (n=10)	67.6	2200	1.78

### 19. Assessing the Effect of different heat synchronization protocols in anestrus and repeat breeding in dairy animals: KVK Kheda

KVK Kheda Conducted trials to assess the effect of different heat synchronization protocols in anestrus and repeat breeding in dairy animals. The trial conducted are Ovsynch protocol (T<sub>2</sub>), Modified Ovsynch Protocol (T<sub>3</sub>) and Farmers Practices (T<sub>1</sub>). The result indicates that there is an increase in conception percentage rate of Modified Ovsynch Protocol 77.8 per cent compared to Ovsynch protocol and farmers practice 77.8 per cent, 62.5 per cent and 33.3 per cent respectively.

The estrus induction rate was higher observed in both hormonal synchronization protocols as compare to control. Higher conception rate was observed in



animals treated with Modified Ovsynch Protocol as compared to Ovsynch Protocol in anestrus and repeat breeding dairy animals.



Technology Assessed		Estrus Induction Rate	Conception Rate
T <sub>1</sub>	Farmers Practices No Use of Any treatment	6/10 (60%)	2/6 (33.3%)
T <sub>2</sub>	Ovsynch protocol (0day – GnRH, 7day PG, 9 day- GnRH, 10 day FTAI)	8/10 (80%)	5/8 (62.5%)
T <sub>3</sub>	Modified Ovsynch Protocol (Pre PG followed by 6day – GnRH, 11day PG, 13 day- GnRH, 14 day FTAI)	9/10 (90%)	7/9 (77.8%)

## 20. Assessment of Azolla as feed supplement in dairy cattle KVK Junagadh

Presently, Azolla green fodder feeding is being considered essential for lactating dairy animals. Azolla is nothing but floating fern in shallow water, which is very rich in protein, essential amino acids, and vitamins. Azolla can be easily digested by the dairy animal because of its high protein and low lignin content, green Azolla can be used as feed supplement for the milch animals (500-1000gm per day) which could increase the milk production by 7-13 per cent.

KVK Junagadh conducted 5 trials to assess the effect of Azolla as feed supplement in dairy cattle. The recommended practice use of Jowar straw, green fodder, cotton seed cake and addition of Green azolla to feed dairy cattles. The result revealed that there is an increase in Milk production 7.92 (l/ day/ animal)



and milk fat 4.10 per cent. Farmers are satisfied with the technology (T<sub>2</sub>: Use of Jowar straw, green fodder, and cotton seed cake as a cattle feed and Green Azolla) as it reduce the cost as well as increase the fat percent and milk production.

Technology Assessed		Milk fat (%)	Milk Production (Ltr/day/animal)	B:C Ratio
T <sub>1</sub>	Farmers Practice (T <sub>1</sub> ) Use of Jowar straw, green fodder, and cotton seed cake as a cattle feed	3.25	7.05	1.91
T <sub>2</sub>	Assessed Practice (T <sub>2</sub> ) T <sub>1</sub> + Green Azolla	4.10	7.92	2.31

## V: Drudgery reduction

### 21. Assessment of different type of hand operated wheel hoe in tomato crop in Bhal region: KVK Ahmedabad

Agriculture has been established as one of the drudgery prone occupation of unorganized sector due to lack of access to improved agricultural technologies. Weeding is a main drudgery prone activity mostly performed by farm women and to resolve this problem KVK Ahmedabad conducted OFT on use of wheel hoe to prove the efficacy of improved weeder in reducing drudgery among women engaged in weeding activity in tomato.



The result shows that the maximum weeding efficiency with 'Sickle' was observed because of the



capability of this hand tools to work between plant-to-plant spaces in a row. Push type cycle weeder and push and pull type wheel hoe cannot be used for closer plants. This may be the reason for low weeding efficiency. As weeding is a labour consuming process and because of minimum field capacity of 'Sickle' the cost of operation 'Sickle' for weeding was maximum. Use of wheel hoe for weeding in tomato was found to

be advantageous in terms of 50-60 per cent saving in time and 50 per cent saving in cost of sowing as compared to the conventional practice of weeding.

The main aim of this trial was to reduce drudgery, increasing the working efficiency of farm women and also reduce the cost of weeding operation to farmers by introducing three type wheel hoe.

Technology Assessed		Work Load (man hr/ha)	Cost of Operation (Rs./ha)	Weeding Capacity (ha/hr)	Weeding Efficiency (%)	Time Saving (%)	Cost Saving (%)
T <sub>1</sub>	(Farmer's practice) Use of Sickle	250	6800	7813	4.0x10 <sup>-3</sup>	95-98%	-
T <sub>2</sub>	Use of Wheel hoe	159	4200	4969	6.2x10 <sup>-3</sup>	93-85%	36.40
T <sub>3</sub>	Use of push and pull type wheel hoe	165	3400	5156	6.6x10 <sup>-3</sup>	80-82%	34.0

## VI: Farm Machinery

### 22. Assessment of different Methods of Cotton Sowing : KVK Kutch-I

Dibbling is a method of putting a seed or a few seeds or seed materials in a hole or pit or pocket, made at predetermined spacing and depth with a dibble or planter or very often by hand or by any convenient implements such as spade, hoe etc. and covering them with soil. The dibbling method is suitable for wider spaced planted crops requiring a specific area for their canopy development or cultural practices such as weeding, earthing up, and irrigation in furrows. Dibble is good for timely sowing during scarcity of



labour and germination is also good. Dibbling method of cotton sowing saved 25 per cent labour cost and saved 15 per cent seed requirement. Germination is almost same in both the method.

Technology Assessed		Sowing Time Required (hr/ha)	Seed Requirement (gm/ha)	Germination (%)	Labour Cost (Rs./ha)
T <sub>1</sub>	Farmers practices Hand Sowing	28	2250	95	1050
T <sub>2</sub>	Sowing by Dibbler	21	1900	95	788

## VII: Storage technique

### 23. Assessment of PICS bag for Groundnut storage: KVK Jamnagar

KVK Jamnagar conducted OFT on the use of PICS bags for Groundnut storage. Use of Perdue Improved Crop Storage (PICS) technology, triple layer bag consisting of two high-density inner polyethylene plastic bags (inner liners) and a third outer sack (a woven polypropylene bag) for storage of groundnut



pod up to six months were highest protection against insect damage (3.08 per cent) and lowest weight loss (1.56 per cent) and reduce input cost as well as

hazardous effect. PICS bags have very less insect damage as well as weight loss. This treatment is chemical-less and hazardless.

Technology Assessed		Healthy pod obtained out of 100 kg storage	Storage cost (Rs./100 kg)	Loss of due to spoilage (Rs./100 kg)	Net Return (Profit) in (Rs./ 100 kg)	B:C Ratio (Clo.18/(Col. 16+17)
T <sub>1</sub>	Open heaps in storage godown	82.4	20	880	3220	4.58
T <sub>2</sub>	Local practices for storage in plastic bag /closely woven bag	94.56	100	272	4356	12.71
T <sub>3</sub>	Storage in Triple layer hermetic "Purdue Improved Crop Storage" (PICS) bags	98.44	170	78	4922	19.85

## VIII: Resource Conservation Technology

### 24. Assessment of mulching technique in watermelon: KVK Mehsana

The use of plastic mulching and drip irrigation facilitates efficient weed & water management and efficient water fertilizer application. Plastic mulches reduce weed population and maintain requisite soil temperature. Drip irrigation is a method of precise application of irrigation method; not only it aids in lowering weed population but also provides an environment best suitable for crop growth. Drip irrigation also aids in the efficient application of fertilizers.

Trial was conducted by KVK Mehsana on assessment of plastic mulching and drip irrigation in watermelon. In watermelon crop, the incremental increase in yield,



net return and B:C ratio observed due to use of organic mulch and 20 microns plastic mulch 5550 meter/ha. Thus the results proved that plastic mulching along with drip irrigation is beneficial than the conventional cultivation practices, with 23.60 and 6.32 per cent water saving over T<sub>1</sub> and T<sub>2</sub> respectively.

Technology Assessed		Drip Irrigation (Hour) (Flow rate 2 lit/hour)	Yield (q/ ha)	Net Return (Rs. / unit)	B:C Ratio
T <sub>1</sub>	(Farmers practices) Without mulch	233	379	96022.50	1.73
T <sub>2</sub>	Organic mulch @ 2.5 ton/ha	190	446.45	226058.00	2.47
T <sub>3</sub>	20 microns plastic mulch 5550 meter/ha	178	487	324267.50	2.99

## IX: Value addition

### 25. Assessment of Preservation techniques of different pulses with organic methods: KVK Junagadh

KVK Junagadh conducted 10 trials on assessment of preservation techniques of different pulses with organic methods like use of Neem leaves (500 gm leaves/ 50 kg food grain) ( $T_1$ ), Use of Castor oil (10 ml oil / kg food grain) ( $T_2$ ) and  $T_2$ +Use of Pro super bag. The result indicates that Use of Castor oil (10 ml oil / kg food grain) and Use of Pro super bag ( $T_3$ ) is best technique for preservation of different pulses. The farmwomen said that this method ( $T_3$ ;  $T_2$ +Use of Pro super bag) is economically cheaper, locally available,



so preserve all type of pulses dals with this organic method.

Technology Assessed		Insect infestation (%)
$T_1$	Farmers Practice- Use of Neem leaves (500 gm leaves/ 50 kg food grain)	11.50%
$T_2$	Use of Castor oil (10 ml oil / kg food grain)	7.5 %
$T_3$	$T_2$ +Use of Pro super bag	2.5%

### 26. Assessment of Mango Squash preparation method: KVK Mehsana

The popularity of Mango (*Mangifera indica* L.), in the international market, is due to its excellent taste, attractive fragrance, beautiful colour, as well as nutritional properties. In addition, mangoes are a good source of ascorbic acid, carotenoids and phenolic compounds and other dietary antioxidants. Post-harvest losses of mango fruits in India are very high i.e. 20 to 30 per cent every year and these losses can be minimized by utilizing green fruits for making pickles or chutney or as a sundried acidifying condiment (AMCHUR). Several processed foods are prepared from mango in which squash plays an important role and is mainly used during the summer season as a beverage.

KVK Mehsana conducted 10 trials on the assessment of the Mango Squash preparation method. The KVK



conducted different methods like Green Mango 1 kg + Sugar 450 gm + Sodium Benzoate 1 gm and Green Mango 1 kg + Sugar 1.5 kg + Citric acid 8 gm + Potassium Metabisulphite 2 gm to avoid Spoilage of Squash during storage. These study observed that durability increased and best taste, as per taste parameter  $T_3$  is best but as per durability  $T_2$  is best

Technology Assessed		Durability	Colour
$T_1$	Farmers practices No use of preservative	15 days	Changed
$T_2$	Green Mango 1 kg + Sugar 450 gm + Sodium Benzoate 1 gm	273 days	Not changed
$T_3$	Green Mango 1 kg + Sugar 1.5 kg + Citric acid 8 gm + Potassium Metabisulphiet 2 gm	243 days	Not changed



## X: Nutritional Management

### 27. Impact of RDF, NAA and mulching on yield attributes of Mango (*Mangifera indica* L.) cv. Kesar under semi-arid ecosystem: KVK Panchmahal

The trial was conducted to find out the effect of RDF, NAA and mulching on fruit drop in mango (*Mangifera indica* L.) cv. Kesar under a semi-arid ecosystem at Krishi Vigyan Kendra, Panchmahal. The causes of

fruit drop are non-pollination and fertilization, competition between developing fruits and hormonal imbalance. The application of irrigation, NAA and grass mulching alone or in combination reduced the fruit drop in mango considerably. The fruit weight (216g), Fruit length (9.29 cm), Net return (240600 Rs/ha), B: C Ratio 5.31 and yield (98.80 q/ha) were recorded in T<sub>4</sub> 75% T<sub>2</sub> (RT) +two sprays of NAA@ 20 ppm at III<sup>rd</sup> week of March (pea stage) and IV<sup>th</sup> of April (marble stage). The net return and B: C ratio also increases than other treatments.

Technology assessed		Fruit weight (g.)	Yield (q/ha)	Net return (Rs/ ha)	B:C ratio
T <sub>1</sub>	Farmers Practices: Application of imbalance manure, fertilizers and irrigation.	195	65.52	82540	2.70
T <sub>2</sub>	Recommended technology (manure (70 kg) and fertilizers N-1000g (Urea-1.6 kg), P-750g ( DAP-1.6 kg) and K-750 g (MOP-1.25 kg/plant)+ mulching with grasses /straw (15 kg dry grass / sqm)	211	88.92	205260	4.34
T <sub>3</sub>	Recommended Technology +two spray of NAA@ 20 ppm at III <sup>rd</sup> week of March (pea stage) and IV <sup>th</sup> of April (marble stage)	224	109.20	260850	4.91
T <sub>4</sub>	75% T <sub>2</sub> (RT) + two spray of NAA@ 20 ppm at III <sup>rd</sup> week of March (pea stage) and IV <sup>th</sup> of April (marble stage).	216	98.80	240600	5.31

## Results of Selected On Farm Trials: Goa

### Varietal Evaluation

#### 1. Assessment of Tomato varieties / hybrids resistant to bacterial wilt: KVK North Goa

KVK North Goa conducted on-farm trial on assessment of bacterial wilt resistances varieties of tomato to find the performances for better yield with disease resistance at farmer's field situation. The varieties tested were Arka Rakshak and Konkan Vijay with farmer practices as check. The results revealed that yield increase by 141.29 per cent and 33.83 per cent over the farmer practices. The variety Arka Rakshak gave highest yield of 485 qt. per ha with net return of Rs. 91191/- and BCR of 4.80. While Konkan Vijay provided 269 q/ha with net return of Rs. 31993/-



and BCR of 2.70 as compared to the local variety (201 q/ha).

Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers practice: Local variety	201.00	13530	1.90
T <sub>2</sub>	Improved variety Arka Rakshak	485.00	91191	4.80
T <sub>3</sub>	Improved variety Konkan Vijay	269.00	31993	2.70

## 2. Assessment of different varieties of finger millet : KVK North Goa

KVK, North Goa conducted on-farm trials on finger millet to assess the performance of high-yielding varieties Dapoli no.2, KMR-301 and GPU-67 with the comparison of local variety to increase production and productivity. The economic analysis shows that variety KMR-301 gave a higher yield (27.32 q/ha) with Rs. 59025/- net return and 2.29 B:C ratio followed by variety GPU-67 provided 21.9 q/ha yield and Dapoli No-2 gave 16.15 q/ha yield as compared to the local variety (12.8 q/ha). Results indicated that all selected varieties performed well in competition with the local variety but KMR-301 performed very well in



terms of yield as well as economically to other varieties.

Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers practice: Local variety	12.80	1366	1.17
T <sub>2</sub>	Improved variety Dapoli No. 2	16.15	4639	1.35
T <sub>3</sub>	Improved variety KMR - 301	27.32	59025	2.29
T <sub>4</sub>	Improved variety GPU - 67	21.90	16970	1.79

## 3. Assessment of new paddy variety district : KVK South Goa

Paddy is main crop in south Goa. Due to lack of technical knowledge, like sowing method and use of old variety the productivity level is low. An on farm trial was conducted during *Kharif* 2020-21 at five improved variety different locations to assess high yielding variety of paddy under irrigated condition. The variety Ratnagiri-7 recorded highest yield 46.00 q/ha and net return Rs. 42000/- with 1.8 BD ratio which contributes for increased (31.05 per cent) yield with in comparison to check variety Jyoti. Ratnagiri-6 was also obtained more yield 40.20 q/ha with maximum net return of Rs. 30500/- compared to local variety.



Technology Assessed		Yield (q/ha)	Net Return (Rs/ha)	B:C Ratio
T <sub>1</sub>	Farmers practices : Local variety Jyoti	35.1	18500	1.35
T <sub>2</sub>	Variety Ratnagiri-6	40.2	30500	1.58

# Frontline Demonstrations

## Chapter 3

Frontline extension is dealt by the KVKs where proven technologies are demonstrated at farmers' fields under close supervision of the scientists/experts. It shows the production potential of improved technologies to the farmers. KVKs played important role to showcase and promote the latest varieties and other technologies related to cereals, pulses, oilseeds, fruits, vegetables, etc. to enhance the production and productivity of the crops and profitability of the farmers.

In total, 20931 frontline demonstrations were

conducted on different commodities and enterprises in the Zone covering an area of 3753.02 ha in the states of Maharashtra, Gujarat and Goa (Table 3.1). These included cereals and millets (3135), pulses (1764), oilseeds (1078), commercial crops (252), fodder crops (352), fruit crops (889), vegetable crops (1486), tuber crops (126), flower crops (72), plantation crops (40), spice crops (755) and hybrids of various crops (1792). KVKs also conducted demonstrations on farm implements (1974), livestock and fisheries (3941) and enterprises (3255).



**Table 3.1 Frontline demonstrations at a glance in the zone**

Crop category	Maharashtra		Gujarat		Goa		Total	
	Demos (No.)	Area (ha)	Demos (No.)	Area (ha)	Demos (No.)	Area (ha)	Demos (No.)	Area (ha)
Cereals & Millets	890	284	2237	708.5	8	2	3135	994.5
Commercial crops	220	79.6	32	9			252	88.6
Flower crops	48	7	24	7			72	14
Fodder crops	129	13.4	223	38.6			352	52
Fruit crops	458	151.8	421	172.65	10	0.5	889	324.95
Medicinal and Aromatic crops			20	8			20	8
Oilseeds	610	237.85	468	176			1078	413.85
Plantation crops	35	29	5	0.25			40	29.25
Pulses	814.00	319.20	930	269.75	20	1.5	1764	590.45
Spices	213	47.4	522	188.86	20	2	755	238.26
Tuber crops	43	4.6	83	14.6			126	19.2
Vegetables	667	206.69	794	190.46	25	1.5	1486	398.65



Crop category	Maharashtra		Gujarat		Goa		Total	
	Demos (No.)	Area (ha)	Demos (No.)	Area (ha)	Demos (No.)	Area (ha)	Demos (No.)	Area (ha)
Hybrids	886	272.81	906	308.5			1792	581.31
Farm implements	1405		569				1974	0
Enterprises	2028		1207		20		3255	0
Livestock & Fisheries	1331	11755 (No.)	2592	5463 (No.)	18	12001 (No.)	3941	29219(No.)
<b>Total</b>	<b>9777</b>	<b>1653.35</b>	<b>11033</b>	<b>2092.17</b>	<b>121</b>	<b>7.5</b>	<b>20931</b>	<b>3753.02</b>

## Maharashtra

### FLDs on Pulses and Oilseeds

Technology demonstrations on pulses were organized on an area of 302 ha involving 766 farmers and on oilseeds covering an area of 237.85 ha involving 610 farmers. The crop and thematic area wise information is exhibited in tables.

### FLDs on Pulses

In total 428 demonstrations were laid out on chickpea, 13 on black gram, 5 on cow pea, 30 on field bean, 75 on green gram and 263 on pigeon pea covering an area of 302 ha at farmers' fields (Table 3.2). In chick pea, on an average 17.69 q/ha yield was obtained with adoption of full package of practices which was 24.42% higher over local check (14.22 q/ha). Among above technologies, Integrated Crop Management gave highest yield of 21.72 q/ha under demonstrations. In Cow Pea, varietal component gave yield of 13.40 q/ha



which found superior over local check (12.50 q/ha). In green gram, technologies such as integrated crop management and varietal components gave yield of 8.30 q/ha which was 24.81% more as compared to local check (6.65 q/ha). Under pigeon pea, mean yield of 15.58 q/ha was attained under demonstrations with net economic gain of Rs. 68813 per ha.

**Table 3.2 Thematic area wise physical achievements of FLDs on pulses in Maharashtra**

Crop	Thematic Area	KVK	Far mers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Blackgram	Varietal	1	13	5.20	11.73	9.36	25.32	27723	21488
Chickpea	ICM	4	147	59.00	21.72	16.62	30.73	77563	55469
	INM	7	84	33.60	16.96	13.54	25.28	37814	26424
	IPDM	6	78	31.20	17.97	14.90	20.55	62052	49195
	IPM	8	106	38.00	17.01	14.04	21.14	52482	35139
	Varietal	1	13	5.00	14.78	11.98	23.37	62540	48790
	<b>Sub-Total</b>		<b>428</b>	<b>166.80</b>	<b>17.69</b>	<b>14.22</b>	<b>24.42</b>	<b>58490</b>	<b>43003</b>
Cowpea	Varietal	1	5	1.00	13.40	12.50	7.20	30000	15800
Field bean	Varietal	1	30	11.00	13.25	11.90	11.34	43400	25700
Greengram	ICM	1	25	10.00	8.30	6.65	24.81	36100	23550
	Varietal	1	50	20.00	8.70	7.20	20.83	28000	19360
	<b>Sub-Total</b>		<b>75</b>	<b>30.00</b>	<b>8.50</b>	<b>6.93</b>	<b>22.74</b>	<b>32050</b>	<b>21455</b>

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Pigeonpea	ICM	3	125	50.00	19.69	16.23	21.33	93563	75648
	IDM	2	50	20.00	14.19	12.93	9.74	66194	58213
	IPDM	2	35	14.00	13.75	11.65	18.03	54500	43895
	IPM	3	43	17.20	14.47	11.12	30.19	52304	30515
	Varietal	1	10	4.00	15.80	14.10	12.06	77502	67627
	<b>Sub-Total</b>		<b>263</b>	<b>105.20</b>	<b>15.58</b>	<b>13.21</b>	<b>17.98</b>	<b>68813</b>	<b>55180</b>
<b>Grand Total</b>			<b>766</b>	<b>302</b>					

### Performance of Chickpea Demonstrations in Maharashtra

In Maharashtra, 428 chickpea demonstrations were organized with special focus on improved cultivars and full package of practices on 166.80 ha area with net gain of Rs. 51936 per ha. On an average 18.96 q/ha yield was achieved by the farmers with adoption of

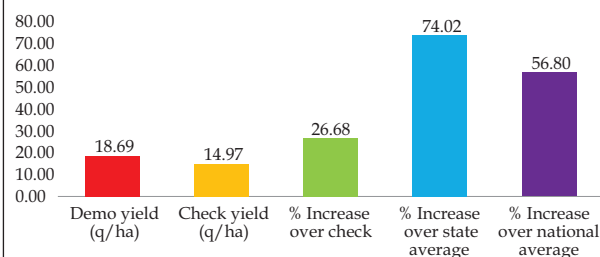
different improved cultivars. RVG 202 cultivar performed well and provided 24.69 q/ha yield with net profit of Rs. 35297/ha. Under BDNG-797 cultivar, yield of 14.47 q/ha was attained with economic gain of Rs. 43503/ha (Table 3.3). In Maharashtra, chickpea yield was higher by 56.80% over national and 74.02% at state level (Fig. 3.1).

**Table 3.3 Variety wise performance of chickpea in Maharashtra**

Variety	District/KVK	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
BDNG-797 (Akash)	Aurangabad-I, Aurangabad-II, Parbhani	103	41.20	14.47	12.05	20.13	43503	32474	33.96
Digvijay	Aurangabad-II, Dhule, Nagpur-I, Nashik-II, Sangli-I, Solapur-I	91	34.40	18.21	14.47	25.82	53261	35468	50.16
JAKI-9218	Beed-I, Gadchiroli, Hingoli, Jalna-I, Latur, Osmanabad, Satara-II, Washim	116	44.00	17.10	14.54	17.62	53123	41008	29.54
Phule Vikram	Aurangabad-I, Jalgaon-I, Jalgaon-II, Nandurbar, Solapur-II	105	42.00	20.34	15.49	31.31	74496	53254	39.89
RVG 202	Akola	13	5.20	24.69	18.29	34.99	35297	20612	71.24
<b>Total</b>		<b>428</b>	<b>166.8</b>	<b>18.96</b>	<b>14.97</b>	<b>26.68</b>	<b>51936</b>	<b>36563</b>	<b>42.05</b>



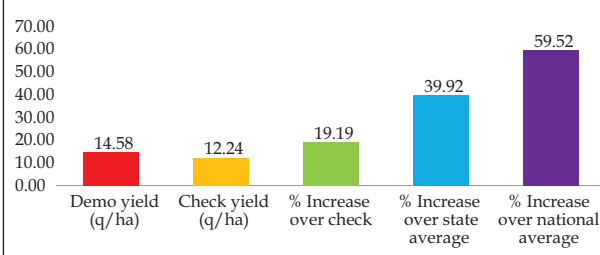
Fig 3.1 Yield performance of Chickpea under FLDs in Maharashtra



## Performance of Pigeon pea Cultivars in Maharashtra

Under technology demonstrations on pigeon pea, seven cultivars BDN-711, BDN-716, BSMR-716, Godavari, Gupchup, Maruti and PKV TARA, were demonstrated on 105.20 ha area at farmers' fields. On an average 14.58 q/ha productivity was attained under demonstrations which was higher (19.19%) over local cultivars. Highest yield of 21.44 q/ha was achieved under BDN-711 in Nanded, Jalna and Aurangabad districts with net profit of Rs. 89421/ha (Table 3.4). In Maharashtra, pigeon pea yield was

Fig 3.2 Yield performance of Pigeon pea under FLDs in Maharashtra



higher by 59.52% over national and 39.92% at state level (Fig. 3.2).

Table 3.4 Variety wise performance of pigeon pea in Maharashtra

Variety	District/ KVK	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
BDN-711	Aurangabad-I, Jalna-II, Nanded-I	55	22.00	21.44	17.48	22.63	89421	65315	36.91
BDN-716	Amaravati-I, Latur, Washim	60	24.00	14.58	12.59	15.75	62204	49929	24.58
BSMR-716	Latur	25	10.00	16.20	14.10	14.89	54700	44500	22.92
Godavari (BDN-2013-41)	Aurangabad-I, Parbhani	75	30.00	19.72	15.70	25.61	98060	78931	24.24
Gupchup	Aurangabad-II	10	4.00	11.30	9.20	22.83	54300	43290	25.43
Maruti (ICP 8863)	Akola	25	10.00	14.85	14.08	5.47	72057	67846	6.21
PKV-TARA	Gondia	13	5.20	4.00	2.50	60.00	18000	6750	166.67
<b>Total</b>		<b>263</b>	<b>105.20</b>	<b>14.58</b>	<b>12.24</b>	<b>19.19</b>	<b>64106</b>	<b>50937</b>	<b>25.85</b>

## Oilseed Crops

In Maharashtra, frontline demonstrations were conducted on soybean (481), groundnut (86) and niger (43) covering an area of 237.85 ha at farmers' fields (Table 3.5). In soybean, 20.5 q/ha mean yield was achieved under demonstrations which was

15.34% higher over local practice (17.77 q/ha). Net profit of Rs. 73739/ha was obtained by the farmers. Under groundnut, 20.72 q/ha yield was achieved with net profit of Rs. 56629/ha. In niger, productivity of 4.29 q/ha was realised by the farmers under demonstrations which was 15.95% more as compared to local check (3.70 q/ha).



Table 3.5 Thematic area wise physical achievements of FLDs on oilseeds in Maharashtra

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Groundnut	ICM	1	50	20.00	20.35	16.38	24.24	48085	34778
Groundnut	INM	2	23	5.40	22.55	17.65	27.76	64356	48451
Groundnut	IPM	1	13	5.25	19.25	16.50	16.67	57445	43425
	<b>Sub-Total</b>		<b>86</b>	<b>30.65</b>	<b>20.72</b>	<b>16.84</b>	<b>23.0</b>	<b>56629</b>	<b>42218</b>
Niger	Varietal	2	43	15.00	4.29	3.70	15.95	15845	9940
Soybean	ICM	4	103	41.20	21.83	19.21	13.65	72090	58712
Soybean	INM	4	60	24.00	22.42	17.89	25.37	70010	48493
Soybean	IPDM	2	28	11.20	17.23	15.59	10.49	60015	51408
Soybean	IPM	11	195	75.80	18.40	15.56	18.24	56059	41320
Soybean	IWM	1	10	2.00	21.89	21.15	3.50	100070	93400
Soybean	Varietal	5	85	38.00	21.23	17.24	23.17	84188	64115
	<b>Sub-Total</b>		<b>481</b>	<b>192.20</b>	<b>20.5</b>	<b>17.77</b>	<b>15.34</b>	<b>73739</b>	<b>59575</b>
	<b>Grand Total</b>		<b>610</b>	<b>237.85</b>					

### Performance of Soybean Cultivars in Maharashtra

Under soybean, average yield of 20.5 q/ha was attained with adoption of improved varieties and earned Rs. 73739/ha net return by the farmers.

Highest yield was obtained under Phule Sangam cultivar in Ahmednagar, Beed, Dhule, Kolhapur and Sangli districts followed by MACS-1281 in Buldhana district (Table 3.6). In Maharashtra, soybean yield was higher by 106.84 % over national and 38.29 % at state level (Fig. 3.3).

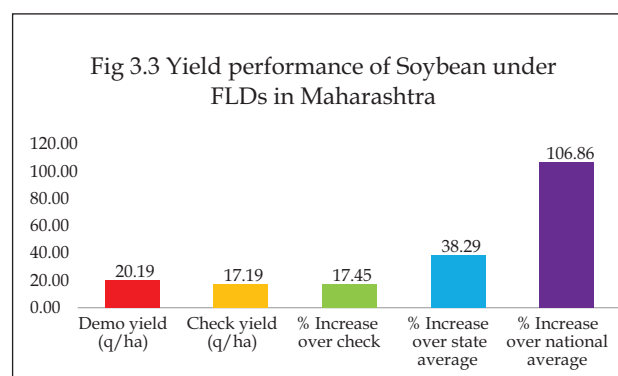


Table 3.6 Variety wise performance of soybean in Maharashtra

Variety	District/ KVK	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
JS-335	Akola, Kolhapur-II, Sangli-I, Washim, Yavatmal-I	61	21.40	17.21	15.46	11.34	47607	39167	21.55
JS-9305	Akola, Amaravati-I, Wardha	66	26.40	15.13	13.17	14.90	40061	31661	26.53
MACS-1281	Buldhana-I	25	14.00	23.59	19.29	22.29	109092	84643	28.88
MAUS-158	Aurangabad-I, Beed-I, Beed-II, Latur, Nagpur-I, Wardha, Washim	116	46.40	18.45	15.46	19.29	53895	40494	33.09

Variety	District/ KVK	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
MAUS-612	Osmanabad, Parbhani	35	14.00	18.98	16.72	13.52	83768	69713	20.16
MAUS-71	Hingoli, Nanded-I	40	14.80	23.51	20.80	13.04	93698	73275	27.87
Phule Sangam (KDS- 726)	Ahmednagar-II, Beed-I, Dhule, Kolhapur-II, Sangli-I	138	55.20	24.43	19.41	25.81	86420	61848	39.73
<b>Total</b>		<b>481</b>	<b>192.20</b>	<b>20.50</b>	<b>17.77</b>	<b>15.34</b>	<b>73739</b>	<b>59575</b>	<b>28.38</b>

## Cereals and Millets

Farmers' profit can be increased by adopting latest technologies under different crops of cereals and millets. Frontline demonstrations were conducted on paddy (393), wheat (141), Jowar (180), Bajra (25), Maize (15) and finger millet (136) covering an area of 284 ha in field situations (Table 3.7). In Bajra, average yield obtained in demonstrations was 28 q/ha which was 64.71% more as compare to check (17 q/ha). In finger millet demonstrations, average yield of 14.14

q/ha was obtained with economic gain of Rs. 28908/ha which was superior by 17.74 % over local practice (Rs. 20392/ha). Under Jowar, mean yield of 20.67 q/ha was realised by the farmers by following full package of practices which was higher (25.37 %) as compared to farmer's practice and net profit of Rs. 47425/ha was obtained. In paddy, 38.02 q/ha yield was attained which was higher by 21.57 % over local check. Under wheat, 29.70 q/ha yield was achieved with improved practices which showed better performance as compared to farmer's practice.



**Table 3.7 Thematic area wise physical achievements of FLDs on cereals and millets in Maharashtra**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Pearl Millet	ICM	1	25	10.00	28.00	17.00	64.71	89000	49300
Finger millet	ICM	2	54	15.00	13.75	11.85	16.03	17850	8685
Finger millet	INM	4	82	24.00	14.53	12.16	19.51	39965	32099
	<b>Sub-Total</b>		<b>136</b>	<b>39.00</b>	<b>14.14</b>	<b>12.01</b>	<b>17.74</b>	<b>28908</b>	<b>20392</b>
Jowar	ICM	4	98	39.00	20.70	16.26	27.27	38573	25782
Jowar	IPM	1	13	5.00	16.26	13.75	18.25	28832	22650
Jowar	Varietal	4	69	25.00	25.05	19.45	28.78	74871	49959
	<b>Sub-Total</b>		<b>180</b>	<b>69.00</b>	<b>20.67</b>	<b>16.49</b>	<b>25.37</b>	<b>47425</b>	<b>32797</b>
Maize	IPM	1	15	3.00	55.26	51.64	7.01	65418	56743

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Paddy	IDM	2	38	12.60	37.20	28.15	32.13	91525	56650
Paddy	INM	5	103	30.20	32.81	25.97	26.35	25286	12039
Paddy	IPM	4	79	25.40	37.17	31.68	17.31	31510	21863
Paddy	IWM	1	4	2.00	42.40	35.70	18.77	34113	12019
Paddy	Varietal	6	169	45.40	42.08	36.14	16.43	36763	24621
	<b>Sub-Total</b>		<b>393</b>	<b>115.60</b>	<b>38.02</b>	<b>31.53</b>	<b>21.57</b>	<b>438309</b>	<b>25438</b>
Wheat	ICM	1	13	5.20	22.30	21.19	5.24	15880	11520
Wheat	IPM	1	20	8.10	39.00	33.00	18.18	46986	32599
Wheat	IWM	3	33	13.20	29.55	26.21	12.74	23082	15362
Wheat	Varietal	5	75	21.00	27.95	23.00	21.50	36037	24663
	<b>Sub-Total</b>		<b>141</b>	<b>47.50</b>	<b>29.70</b>	<b>25.85</b>	<b>14.89</b>	<b>30496</b>	<b>21036</b>
	<b>Total</b>		<b>890</b>	<b>284.10</b>					

### Varietal Performance of Paddy in Maharashtra

Karjat-7 cultivar of paddy provided highest yield of 45.20 q/ha in Nashik area which was 5.73% higher

over local check (42.75 q/ha). Phule Samruddhi cultivar performed well in Kolhapur and Pune districts with average yield of 43.40 q/ha (Table 3.8). In Maharashtra, paddy yield was higher by 40.26 % over national and 80.70 % at state level (Fig. 3.4).

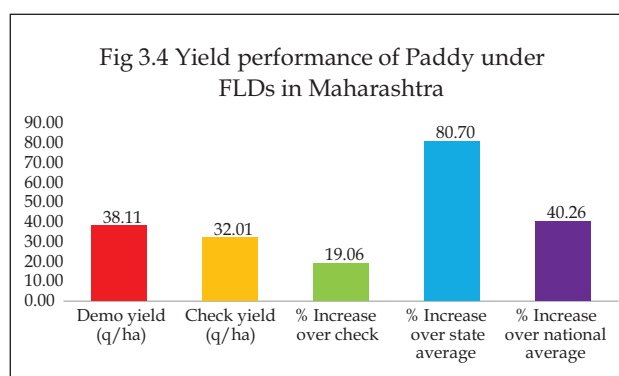


Table 3.8 Variety wise performance of paddy in Maharashtra

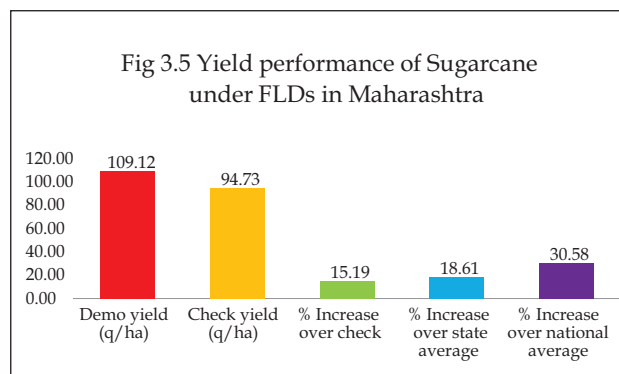
Variety	District/ KVK	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
Indrayani	Ahmednagar-I, Nashik-I	60	14.00	24.43	19.20	27.25	23736	11522	106.01
Karjat-3	Palghar	40	18.00	38.30	32.10	19.31	18795	6265	200.00
Karjat-7	Raigadh	10	5.00	45.20	42.75	5.73	6435	2190	193.84
Karjat-8	Sindhudurg	10	1.00	39.40	30.90	27.51	17200	9900	73.74
Karjat-9	Palghar, Raigadh, Sindhudurg	64	18.00	41.76	34.75	20.17	20849	8599	142.47
PDKV-Khamang	Gadchiroli	13	6.00	39.50	35.60	10.96	54900	42920	27.91
PDKV-Tilak	Bhandara, Chandrapur	39	15.60	35.06	29.75	17.84	41969	29167	43.89



Variety	District/ KVK	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
Phule Samruddhi	Kolhapur-II, Pune-II	26	7.80	43.40	36.15	20.04	94650	69650	35.89
PKV-HMT	Gadchiroli, Gondia	26	10.20	36.45	32.70	11.47	47774	37681	26.79
Ratnagiri-6	Ratnagiri	105	20.00	37.60	26.20	43.51	55700	26650	109.01
<b>Total</b>		<b>393</b>	<b>115.60</b>	<b>38.11</b>	<b>32.01</b>	<b>19.06</b>	<b>38201</b>	<b>24454</b>	<b>56.22</b>

## Commercial Crops

In total, 220 frontline demonstrations on sugarcane were conducted covering an area of 79.60 ha at farmers' fields. Average yield of 1091.21 q/ha was achieved which was 15.19 % higher over local check. Net profit of Rs. 188816 per ha was earned by the farmers under demonstrations. Yield obtained under different components is reported in Table 3.9. In Maharashtra, sugarcane yield was higher by 30.58 % over national and 18.61 % at state level (Fig. 3.5).



**Table 3.9 Thematic area wise physical achievements of FLDs on commercial crops in Maharashtra**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Sugarcane	ICM	2	26	10.20	1052.90	928.80	13.36	134096	107032
Sugarcane	IDM	1	15	6.70	842.00	770.00	9.35	141000	123060
Sugarcane	INM	6	114	42.00	1416.17	1197.92	18.22	269263	209481
Sugarcane	IPM	1	37	9.70	1127.00	935.00	20.53	193780	149440
Sugarcane	Resource Conservation Technology	2	28	11.00	1018.00	905.00	12.49	205943	158532
<b>Sub-Total</b>			<b>220</b>	<b>79.60</b>	<b>1091.21</b>	<b>947.34</b>	<b>15.19</b>	<b>188816</b>	<b>149509</b>

## Flower Crops

A total of 25 demonstrations in Chrysanthemum, 10 in Marigold and 13 demonstrations in Tuberose were conducted covering area of 7 ha at farmers' fields (Table 3.10). In Chrysanthemum, technologies such as varietal introduction gave yield of 105.10 q/ha which

was quite higher (18.62%) as compared to 88.60 q/ha in local check. In Marigold, technology such as varietal introduction gave yield of 148 q/ha which was higher by 57.45% compared to local check (94 q/ha). In Tuberose, varietal introduction gave yield of 227 q/ha with the net profit of Rs. 1130400 per ha.



**Table 3.10 Thematic area wise physical achievements of FLDs on flower crops in Maharashtra**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Chrysanthemum	Varietal	2	25	4.00	105.10	88.60	18.62	113500	70499
Marigold	Varietal	1	10	2.00	148.00	94.00	57.45	52400	19350
Tuberose	Varietal	1	13	1.00	227.00	153.50	47.88	1130400	488500
	Total		48	7.00					

### Fodder Crops

Frontline demonstrations on Maize (28), Guinea grass (20), Sorghum (35), Lucerne (13) and Napier (33) were conducted covering an area of 13.40 ha in field situations (Table 3.11). In maize, technologies such as varietal introduction gave yield of 207.50 q/ha which was higher as compared to local check (157.75 q/ha.). In Sorghum, technologies such as varietal introduction shown yield of 722.50 q/ha whereas in local check 342 q/ha was attained by the farmers. In guinea grass, interventions such as fodder demonstrations gave higher yield of 290 q/ha as compared to local check (200 q/ha). In lucerne, varietal demonstrations provided yield of 340 q/ha which was superior over local check (250 q/ha). In



napier, technologies such as varietal introduction gave yield of 1617.50 q/ha which was higher as compared to local check (1095.00 q/ha.).

**Table 3.11 Thematic area wise physical achievements of FLDs on fodder crops in Maharashtra**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Maize	Varietal	2	28	3.10	207.50	157.75	31.54	92592	60493
Sorghum	Varietal	2	35	3.50	722.50	342.00	111.26	114250	40688
Guinea grass	Varietal	1	20	0.80	290.00	200.00	45.00	18000	10000
Lucerne	Varietal	1	13	2.60	340.00	250.00	36.00	52522	23295
Napier	Varietal	2	33	3.40	1617.50	1095.00	47.72	119450	53075
	Total		129	13.40					

### Fruit Crops

In fruit crops, banana (128), custard apple (14), guava (15), lime (38), mango (60), pomegranate (79), sapota (20), sweet orange (94), watermelon (5) and strawberry (5) frontline demonstrations were conducted covering area of 151.80 ha at farmers' fields (Table 3.12). In banana, technologies such as ICM, IDM and INM gave yield of 752.08 q/ha which was higher (20.1%) than local check (621.05 q/ha). Among above technologies, INM provided highest yield of 802.75 q/ha in demonstration plot. In Custard apple, ICM component gave yield of 43.70 q/ha which showed superiority over local check (36.50 q/ha). In

Guava, INM and IPM technology gave 221.32 q/ha yield which was 35.78% higher than local check (163 q/ha). In lime, ICM and INM component reported yield of 198.34 q/ha which was more as compared to local check (163.70 q/ha). In Mango, technologies such as IFM, INM, IPDM and IPM provided yield of 69.69 q/ha. Among above technologies, IPDM gave highest yield of 95.50 q/ha under demonstrations. In pomegranate, ICM, IDM, INM and IPM components shown good result and furnished yield of 142.12 q/ha which was quite higher (15.32 %) than local practice (123.24 q/ha). Among above interventions, ICM resulted highest yield of 160.43 q/ha. It is proved that



integrated management of crops played a greater role in harnessing higher productivity of crops. In sweet orange, IPM, INM and IPDM related interventions reported productivity of 173.83 q/ha which was 20.06 % higher over local check (144.78 q/ha). Among above technologies, INM exhibited highest yield of

207.80 q/ha in demonstration plots. Sapota, Watermelon and Strawberry reported the demonstration yield 164, 100 and 184 q/ha which was 22.39%, 100% and 384.21% higher than check yields respectively.



**Table 3.12 Thematic area wise physical achievements of FLDs on fruit crops in Maharashtra**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Banana	ICM	2	25	8.00	692.00	571.75	21.03	330000	196650
Banana	IDM	3	45	18.00	761.50	598.17	27.31	655846	438258
Banana	INM	4	58	16.10	802.75	693.23	15.80	430228	290683
	<b>Sub-Total</b>		<b>128</b>	<b>42.10</b>	<b>752.08</b>	<b>621.05</b>	<b>21.10</b>	<b>472025</b>	<b>308530</b>
Custard apple	ICM	1	14	5.60	43.70	36.50	19.73	60010	30575
Guava	INM	1	5	0.10	217.00	119.00	82.35	232000	72000
Guava	IPM	1	10	1.00	225.63	207.00	9.00	426260	392000
	<b>Sub-Total</b>		<b>15</b>	<b>1.10</b>	<b>221.32</b>	<b>163.00</b>	<b>35.78</b>	<b>329130</b>	<b>232000</b>
Lime	ICM	1	10	4.00	197.20	156.40	26.09	286530	209830
Lime	INM	2	28	6.90	199.48	171.00	16.65	200240	136275
	<b>Sub-Total</b>		<b>38</b>	<b>10.90</b>	<b>198.34</b>	<b>163.7</b>	<b>21.16</b>	<b>243385</b>	<b>173053</b>
Mango	IFS	1	20	8.00	86.00	72.00	19.44	112778	74778
Mango	INM	2	19	3.00	66.35	57.90	14.59	50360	30650
Mango	IPDM	1	10	4.15	95.50	76.25	25.25	71075	43188
Mango	IPM	2	11	11.00	30.90	19.50	58.46	86218	15605
	<b>Sub-Total</b>		<b>60</b>	<b>26.15</b>	<b>69.69</b>	<b>56.41</b>	<b>23.53</b>	<b>80108</b>	<b>41055</b>
Pomegranate	ICM	2	20	5.00	160.43	145.51	10.25	444121	364744
Pomegranate	IDM	2	23	10.00	147.00	121.60	20.89	205222	140298
Pomegranate	INM	1	13	5.20	140.54	124.69	12.71	380122	310270
Pomegranate	IPM	2	23	4.60	120.50	101.15	19.13	337443	253423
	<b>Sub-Total</b>		<b>79</b>	<b>24.80</b>	<b>142.12</b>	<b>123.24</b>	<b>15.32</b>	<b>341727</b>	<b>267184</b>
Sapota	IDM	1	20	8.00	164.00	134.00	22.39	113620	76360
Sweet Orange	IPM	2	30	8.00	136.25	110.75	23.02	150175	82408



Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Sweet Orange	INM	4	44	12.00	207.80	169.55	22.56	311510	218467
Sweet Orange	IPDM	1	20	8.00	177.44	154.05	15.18	228164	177992
	<b>Sub-Total</b>		<b>94</b>	<b>28.00</b>	<b>173.83</b>	<b>144.78</b>	<b>20.06</b>	<b>229950</b>	<b>159622</b>
Watermelon	IPM	1	5	5.00	100.00	50.00	100.00	60000	25000
Strawberry	ICM	1	5	0.15	184.00	38.00	384.21	1785000	96200
	<b>Grand Total</b>		<b>458</b>	<b>151.80</b>					

## Plantation Crops

Demonstrations on Cashew (15) and Coconut (20) were organized covering area of 29 ha in field conditions (Table 3.13). In cashew, technology such as

IPM gave yield of 11.95 q/ha which was higher (92.74%) as compared to local practice (6.20 q/ha). In coconut, technology such as IPM reported yield of 10080 nut/ha which showed superiority over check (9420 nut/ha) with 7.01% increase in yield.

**Table 3.13 Thematic area wise physical achievements of FLDs on plantation crops in Maharashtra**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Cashew	IPM	2	15	21.00	11.95	6.20	92.74	74850	24600
Coconut	IPM	1	20	8.00	10080 nuts/ha	9420 nuts/ha	7.01	34020	23900
	<b>Grand Total</b>		<b>35</b>	<b>29.00</b>					

## Spices Crops

Under spices, 213 frontline demonstrations were organized on 47.40 ha area. In Ajwain, 10 varietal demonstrations reported average yield of 9.22 q/ha which was 24.43% higher with net gain of Rs. 95580/ha. In Garlic, 93 demonstrations provided 211.17 q/ha yield as compared to 191.90 q/ha yield in

check plot. In Ginger, technologies such as IDM, IPDM gave yield of 183.00 q/ha which was higher (13.14%) as compared to local practice (161.75 q/ha). In Turmeric, INM and varietal component reported yield of 64.19 q/ha in dry turmeric whereas 189.00 q/ha in fresh turmeric which was 14.27% and 25.17% higher as compared to local check.



**Table 3.14 Thematic area wise physical achievements of FLDs on spices crops in Maharashtra**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Ajwain	Varietal	1	10	4.00	9.22	7.41	24.43	95580	73920
Garlic	Varietal	6	93	7.20	211.17	191.90	10.04	217343	141366

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Ginger	IDM	1	10	4.00	173.20	153.70	12.69	77456	55429
Ginger	IPDM	1	10	4.00	192.80	169.80	13.55	60830	44360
	<b>Sub-Total</b>		<b>20</b>	<b>8.00</b>	<b>183.00</b>	<b>161.75</b>	<b>13.14</b>	<b>69143</b>	<b>49895</b>
Turmeric Dry	INM	4	49	13.80	64.19	56.18	14.27	267363	178915
Turmeric Fresh	Varietal	3	41	14.40	189.00	151.00	25.17	360050	235667
	<b>Sub-Total</b>		<b>90</b>	<b>28.20</b>	<b>126.60</b>	<b>103.59</b>	<b>22.21</b>	<b>313707</b>	<b>207291</b>
	<b>Grand Total</b>		<b>213</b>	<b>47.40</b>					

## Tuber Crops

Under tuber crops, demonstrations on potato (13) and sweet potato (30) were conducted at farmers' fields covering 4.60 ha area (Table 3.15). In potato, technologies such as intercropping in sugarcane gave

yield 456.90 q/ha of potato and realised with Rs. 200532/ha additional net profit in demonstration plots. Component of IPM & ICM in sweet potato yielded 132 q/ha under demonstrations with economic gain of Rs. 123500/ha.

**Table 3.15 Thematic area wise physical achievements of FLDs on tuber crops in Maharashtra**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Potato	ICM	1	13	2.10	456.90	452.50	0.96	200532	112050
Sweet potato	IPM	1	20	2.00	122.00	102.00	19.61	94000	62200
Sweet potato	ICM	1	10	0.50	142.00	130.00	9.23	153000	96000
	<b>Sub-Total</b>		<b>30</b>	<b>2.50</b>	<b>132.00</b>	<b>116.00</b>	<b>13.79</b>	<b>123500</b>	<b>79100</b>
	<b>Grandtotal</b>		<b>43</b>	<b>4.60</b>					

## Vegetable Crops

A total of 667 frontline demonstrations in which 10 amaranths, 25 bitter gourd, 81 brinjal, 15 cauliflower, 58 green chilli, 15 dolichus bean, 26 drumstick, 15 French bea, 60 okra, 305 onion, 16 onion seed, 13 palak, 5 snake gourd, 10 snap melon and 13 tomato were conducted covering 206.69 ha area at farmers' fields (Table 3.16). In bitter gourd, technologies such as INM and IDM shown yield of 106.20 q/ha with net profit of Rs. 226811 /ha. In brinjal, technologies such as ICM, IDM, INM and IPM components gave yield of 217.93 q/ha. In green chilli, technologies such as ICM, INM, Organic farming and Resource Conservation Technologies provided yield of 258.24 q/ha with net profit of Rs. 142534/ha. In dolichus bean, ICM component provided yield of 90.50 q/ha with profit of Rs. 566165/ha. In drumstick, technologies such as ICM and varietal demonstrations gave yield of 102.60 q/ha which was more by 30.20% over local check (78.80 q/ha). In French bean, ICM demonstration exhibited yield of 30 q/ha, which was 36.36% higher as compared to local check (22 q/ha.).



In okra, technologies such as INM, IPM and varietal demonstration gave yield of 146.89 q/ha which was higher (16.07 %) over farmer's practice. In onion, technologies such as Resource Conservation Technologies component reported highest yield of 369.71 q/ha with net profit of Rs. 264714/ha. In tomato, ICM component provided yield of 507.60 q/ha which was higher (15.78 %) as compared to local check (438.40 q/ha).

Table 3.16 Thematic area wise physical achievements of FLDs on vegetable crops in Maharashtra

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Amaranthus	ICM	1	10	0.50	105.00	95.00	10.53	65000	40000
Bittergourd	ICM	1	20	2.00	72.40	57.10	26.80	309622	161179
Bittergourd	IDM	1	5	10.00	140.00	122.00	14.75	144000	100000
	<b>Sub-Total</b>		<b>25</b>	<b>12.00</b>	<b>106.20</b>	<b>89.55</b>	<b>18.59</b>	<b>226811</b>	<b>130589</b>
Brinjal	ICM	1	13	0.90	110.96	94.42	17.52	70774	31577
Brinjal	IDM	1	10	2.00	230.00	195.00	17.95	198000	99000
Brinjal	INM	2	23	6.60	246.50	216.30	13.96	415575	339143
Brinjal	IPM	3	35	4.80	284.24	249.23	14.05	323903	269967
	<b>Sub-Total</b>		<b>81</b>	<b>14.30</b>	<b>217.93</b>	<b>188.74</b>	<b>15.46</b>	<b>252063</b>	<b>184922</b>
Cauliflower	ICM	1	15	4.00	221.00	185.00	19.46	156500	107000
Chilli green	ICM	1	10	4.00	229.75	133.10	72.61	260778	90820
Chilli green	INM	1	25	10.00	314.70	275.30	14.31	94083	83014
Chilli green	Organic Farming	1	10	4.00	235.00	202.50	16.05	95700	75905
Chilli green	Resource Conservation Technologies	1	13	2.60	253.50	216.25	17.23	119575	71219
	<b>Sub-Total</b>		<b>58</b>	<b>20.60</b>	<b>258.24</b>	<b>206.79</b>	<b>24.88</b>	<b>142534</b>	<b>80239</b>
Dolichos bean	ICM	1	15	1.50	90.50	78.90	14.70	566165	381257
Drumstick	ICM	1	13	5.20	115.00	86.00	33.72	211700	146450
Drumstick	Varietal	1	13	5.20	90.20	71.60	25.98	154960	114380
	<b>Sub-Total</b>		<b>26</b>	<b>10.40</b>	<b>102.60</b>	<b>78.80</b>	<b>30.20</b>	<b>183330</b>	<b>130415</b>
French bean	ICM	1	15	3.00	30.00	22.00	36.36	163000	88000
Okra	INM	1	10	1.00	173.00	162.00	6.79	387000	365000
Okra	IPM	1	13	2.60	157.61	125.84	25.25	273034	119709
Okra	Varietal	3	37	9.80	110.05	91.82	19.85	116972	86110
	<b>Sub-Total</b>		<b>60</b>	<b>13.40</b>	<b>146.89</b>	<b>126.55</b>	<b>16.07</b>	<b>25902</b>	<b>190273</b>
Onion	ICM	2	30	9.00	171.79	153.13	12.19	293157	221703
Onion	IDM	1	10	2.00	150.50	138.00	9.06	156297	120056
Onion	INM	4	59	19.00	292.51	255.38	14.54	208517	164279
Onion	IPDM	5	65	26.00	288.06	240.24	19.91	341329	249216
Onion	IWM	1	10	4.00	284.20	239.70	18.56	157157	117151
Onion	Resource Conservation Technologies	1	10	4.00	369.71	336.14	9.99	264714	231142
Onion	Varietal	8	121	49.70	244.66	205.21	19.22	275717	195398
	<b>Sub-Total</b>		<b>305</b>	<b>113.70</b>	<b>257.35</b>	<b>223.97</b>	<b>14.90</b>	<b>242413</b>	<b>185564</b>
Onion seed	Varietal	1	9	0.40	14.40	12.00	20.00	571500	296700
Onion seed	INM	1	7	1.40	8.63	7.38	16.95	227000	173000
	<b>Sub-Total</b>		<b>16</b>	<b>1.80</b>	<b>11.51</b>	<b>9.69</b>	<b>18.84</b>	<b>399250</b>	<b>234850</b>



Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Palak	ICM	1	13	0.09	22.44	6.22	260.77	952000	216000
Snake Gourd	IWM	1	5	10.00	150.00	146.00	2.74	119000	75000
Snap Melon	ICM	1	10	0.50	150.00	121.00	23.97	77501	40000
Tomato	ICM	1	13	0.90	507.60	438.40	15.78	416154	297692
	<b>Grand Total</b>		<b>667</b>	<b>206.69</b>					

## Hybrids

Under hybrids, demonstrations on bajra (15), brinjal (33), chilli green (68), coloured capsicum (13), cotton (242), fodder sorghum (28), maize fodder (30), maize (48), Marigold (13), napier (106), okra (72), onion (10), paddy (66), pigeon pea (25), sorghum (25), soybean (25), tomato (52), watermelon (5) and wheat (10), were conducted covering area of 272.81 ha at farmers' fields (Table 3.17). In cotton, average yield of 13.40 q/ha was

obtained under demonstrations with net economic gain of Rs. 56533/ha. In okra, mean yield of 115.46 q/ha was attained which was higher (23.57 %) over local check (93.44 q/ha). In onion, INM component reported average yield of 109 q/ha which was higher (21.25%) as compared to local check (89.90 q/ha). In tomato, mean yield of 454.18 q/ha was achieved with net profit of Rs. 129509/ha under demonstrations.



**Table 3.17 Thematic area wise physical achievements of FLDs on hybrid crops in Maharashtra**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Bajra	ICM	1	15	6.00	14.19	10.25	38.44	22782	1225
Brinjal	IPM	2	33	13.00	334.18	273.91	22.00	191407	147422
Chilli green	ICM	2	15	5.00	189.00	132.50	42.64	215500	116650
Chilli green	INM	1	20	4.00	130.00	95.00	36.84	191000	128250
Chilli green	IPDM	2	23	6.00	146.58	124.62	17.62	154901	106770
Chilli green	Hybrid	1	10	1.00	110.00	85.00	29.41	393000	208000
	<b>Sub-Total</b>		<b>68</b>	<b>16.00</b>	<b>143.90</b>	<b>109.28</b>	<b>31.68</b>	<b>238600</b>	<b>139918</b>
Colour Capsicum	IDM	1	13	1.00	495.00	366.00	35.25	1915000	944000
Cotton	ICM	2	45	18.00	12.55	10.33	21.55	53610	42740
Cotton	INM	1	13	5.20	8.00	6.50	23.08	29572	17935
Cotton	IPDM	3	70	28.00	15.58	12.91	20.69	56390	37010
Cotton	IPM	8	114	45.60	17.46	14.93	16.94	86559	65479
	<b>Sub-Total</b>		<b>242</b>	<b>96.80</b>	<b>13.40</b>	<b>11.17</b>	<b>19.97</b>	<b>56533</b>	<b>40791</b>

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Fodder Sorghum	Hybrid	3	28	5.00	1440.00	960.00	50.00	125307	56902
Maize fodder	Hybrid	1	30	12.00	500.00	400.00	25.00	64750	49125
Maize	INM	1	13	5.20	66.50	58.00	14.66	50848	41083
Maize	IPM	1	25	10.00	49.25	40.25	22.36	33350	19250
Maize	IWM	1	10	2.00	59.00	55.00	7.27	51813	45975
	<b>Sub-Total</b>		<b>48</b>	<b>17.20</b>	<b>58.25</b>	<b>51.08</b>	<b>14.03</b>	<b>45337</b>	<b>35436</b>
Marigold	INM	1	13	2.60	91.00	76.00	19.74	134000	100200
Napier	Hybrid	7	106	7.81	2307.71	1464.00	57.63	189837	97666
Okra	ICM	3	52	20.80	131.50	106.67	23.28	176100	71167
Okra	INM	1	20	4.00	99.42	80.20	23.97	103105	57228
	<b>Sub-Total</b>		<b>72</b>	<b>24.80</b>	<b>115.46</b>	<b>93.44</b>	<b>23.57</b>	<b>139603</b>	<b>64198</b>
Onion	INM	1	10	4.00	109.00	89.90	21.25	275040	192870
Paddy	INM	3	56	16.20	47.76	37.94	25.89	50046	29617
Paddy	Hybrid	1	10	4.00	64.10	59.35	8.00	38650	0
	<b>Sub-Total</b>		<b>66</b>	<b>20.20</b>	<b>55.93</b>	<b>48.65</b>	<b>14.98</b>	<b>44348</b>	<b>14809</b>
Pigeonpea	IDM	1	25	10.00	13.20	10.75	22.79	56700	43000
Sorghum	ICM	1	25	10.00	21.58	18.20	18.57	38000	25560
Soybean	IPM	1	25	10.00	19.80	16.25	21.85	83300	62000
Tomato	IDM	1	13	2.60	428.00	376.00	13.83	105500	40300
Tomato	INM	1	13	2.60	378.00	321.00	17.76	71600	26850
Tomato	Hybrid	2	26	6.20	556.55	476.75	16.74	211426	156473
	<b>Sub-Total</b>		<b>52</b>	<b>11.40</b>	<b>454.18</b>	<b>391.25</b>	<b>16.09</b>	<b>129509</b>	<b>74541</b>
Watermelon	ICM	1	5	1.00	284.00	212.00	33.96	61000	23500
Wheat	INM	1	10	4.00	27.65	22.56	22.56	104778	73527
	<b>Grand Total</b>		<b>886</b>	<b>272.81</b>					

## Livestock and Fisheries

Integrating livestock and fisheries as components in integrated farming system models is very important for sustainable agriculture and livelihood security. In this context, KVKs had demonstrated different interventions on different components. A total of 1331 demonstrations (206-dairy buffaloes; 451-dairy cow; 262-goats; 412-poultry and 20-fisheries) were conducted covering 11755 livestock (Table 3.18). In dairy buffaloes and cows, technologies like area specific mineral mixture, probiotics, fodder, rumen bypass fat, urea treatment, chaff cutting, ration balancing, management of mastitis, management of infertility etc. provided higher yield over respective local checks. In sheep and goat, technologies such as deworming, ration balancing, mineral mixture, parasite management, disease management etc. gave



higher yield over respective local checks. In case of poultry, technologies such as improved breeds gave higher yield over local check. In fishery, technologies such as Catla, Rohu, Grass carp, Common carp, IFS, composite culture etc. provided higher yield over respective local check.

**Table 3.18 Frontline demonstrations on livestock & fisheries conducted by KVKs of Maharashtra**

Livestock	Thematic Areas	KVK	Demos (No.)	Livestock (No.)	Unit of Yield	Demo Yield	Check Yield	% Increase
Dairy Buffalo	Disease Management	1	24	24	Milk yield L/anim./day	4.19	4.02	4.23
Dairy Buffalo	Nutrition Management	1	13	13	kg/animal	1.62	1.51	7.28
Dairy Buffalo	Nutrition Management	9	152	321	Milk yield L/anim./day	8.26	7.15	15.57
Dairy Buffalo	Nutrition Management	1	4	10	q/ha	210.00	170.00	23.53
Dairy Buffalo	Production and Management	1	13	13	Milk yield L/anim./day	8.60	4.90	75.51
	<b>Sub-Total</b>		<b>206</b>	<b>381</b>				
Dairy Cow	Disease Management	4	50	160	Milk yield L/anim./day	6.25	4.28	46.20
Dairy Cow	Disease Management	1	13	13	No. of ectoparasites/sq inch	2.00	11.00	-81.82
Dairy Cow	Disease Management	1	12	12	number of animals	2.00	5.00	-60.00
Dairy Cow	Nutrition Management	3	46	46	kg/animal	9.90	8.78	12.84
Dairy Cow	Nutrition Management	14	283	718	Milk yield L/anim./day	10.07	8.41	19.77
Dairy Cow	Nutrition Management	3	47	84	q/ha	711.41	615.90	15.51
	<b>Sub-Total</b>		<b>451</b>	<b>1033</b>				
Fishery	Production and Management	1	20	1500	kg of fish	569.00	393.00	44.78
Goat	Breed Management	2	15	32	kg/animal	20.61	14.07	46.48
Goat	Disease Management	3	35	160	kg/animal	20.37	18.96	7.45
Goat	Nutrition Management	14	172	694	kg/animal	12.40	10.49	18.24
Goat	Nutrition Management	1	20	200	Numbers	4.00	2.00	100.00
	<b>Sub-Total</b>		<b>262</b>	<b>1086</b>				
Poultry	Breed Improvement	1	10	20	kg/bird	3.10	2.00	55.00
Poultry	Breed Introduction	1	10	200	No. of eggs /bird/year	120.00	80.00	50.00
Poultry	Breed Introduction	1	6	150	kg/bird	11.00	7.60	44.74
Poultry	Breed Management	5	108	2830	kg/bird	1.90	1.34	41.23
Poultry	Breed Management	3	230	5400	No. of eggs /bird/year	156.00	99.00	57.58
Poultry	Breed Management	1	15	225	Numbers	157.00	85.00	84.71
Poultry	Nutrition Management	1	13	130	Age at sexual maturity in months	2.20	1.70	29.41
Poultry	Production and Management	1	10	100	kg/bird	2.40	1.90	26.32
Poultry	Production and management	1	10	200	No. of eggs /bird/year	164.20	65.46	150.84
	<b>Sub-Total</b>		<b>412</b>	<b>9255</b>				
	<b>Grand Total</b>		<b>1331</b>	<b>11755</b>				



## Gujarat

### FLDs on Pulses

Pulses demonstrations are important to have nutritional security in India. In this context, 352 demonstrations on chick pea, 199 green gram, 97 field bean, 45 black gram and 247 on pigeon pea were conducted at farmers' fields covering 274.75 ha area (Table 3.19). In chick pea, technologies such as ICM, IDM, IPDM, IPM and varietal demonstrations gave mean yield of 15.86 q/ha which was 17.83 % higher over farmer's practice with average net return of Rs.

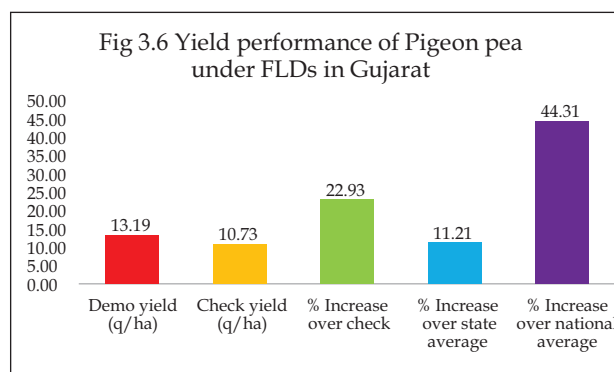
52578/ha. Under varietal demonstrations, yield of 24.11 q/ha was attained with net profit of Rs. 82971/ha. In green gram, INM component gave yield of 17.05 q/ha which found higher over local check (13.63 q/ha). In pigeon pea, ICM, IPDM and varietal components provided average yield of 13.19 q/ha with economic gain of Rs. 43187/ha. Under ICM, pigeon pea performed well (14.73 q/ha) and showed their potentiality.

**Table 3.19 Thematic area wise physical achievements of FLDs on pulses crops in Gujarat**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Blackgram	Varietal	3	45	18.00	6.59	5.64	16.75	14798	9567
Chickpea	ICM	3	69	25.00	12.99	10.26	26.63	39395	28406
Chickpea	IDM	4	70	21.50	13.69	11.62	17.84	37438	30063
Chickpea	IPDM	1	26	9.00	12.92	10.90	18.53	43948	34769
Chickpea	IPM	5	82	28.00	15.60	14.06	10.96	59137	51567
Chickpea	Varietal	6	105	44.00	24.11	20.48	17.72	82971	64637
	<b>Subtotal</b>		<b>352</b>	<b>127.5</b>	<b>15.86</b>	<b>13.46</b>	<b>17.83</b>	<b>52578</b>	<b>41888</b>
Green gram	ICM	2	129	20.85	7.93	5.80	36.64	35962	22737
Green gram	INM	1	10	5.00	17.05	13.63	25.09	81208	60025
Green gram	IPM	1	10	4.00	8.40	7.25	15.86	13460	9350
Green gram	Varietal	4	50	16.00	10.71	8.94	19.87	45065	32286
	<b>Subtotal</b>		<b>199</b>	<b>45.85</b>	<b>11.02</b>	<b>8.91</b>	<b>23.78</b>	<b>43924</b>	<b>31100</b>
Field bean	ICM	1	97	9.70	10.33	8.08	27.85	34103	25100
Pigeonpea	ICM	5	102	18.70	14.73	12.09	21.85	46583	35968
Pigeonpea	IPDM	1	10	5.00	10.85	8.90	21.91	34528	25018
Pigeonpea	Varietal	2	135	50.00	14.00	11.20	25.00	48450	34023
	<b>Subtotal</b>		<b>247</b>	<b>73.70</b>	<b>13.19</b>	<b>10.73</b>	<b>22.93</b>	<b>43187</b>	<b>31670</b>
	<b>Grand Total</b>		<b>940</b>	<b>274.75</b>					

### Varietal Performance of Pigeon Pea in Gujarat

Different improved varieties of pigeon pea were demonstrated and highest yield of 15.90 q/ha was attained with GT-105 cultivar in Dang and Surat followed by GT-104 (14.96 q/ha) in Bharuch, Valsad and Surat districts (Table 3.20). In Gujarat, pigeon pea yield obtained was 44.31 % more than national and 11.21 % higher than state level average yield (Fig. 3.6).



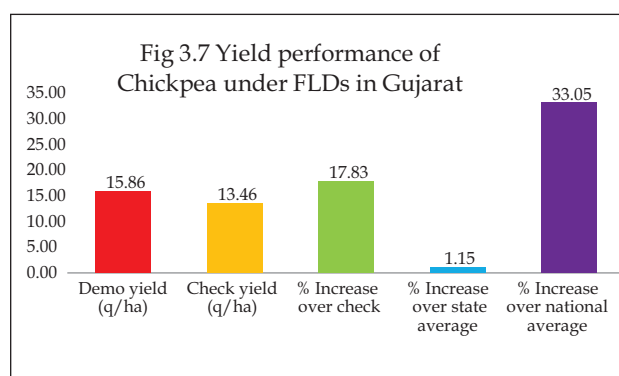
**Table 3.20 Variety wise performance of pigeon pea in Gujarat**

Variety	District/KVK	No. of Demos	Area (ha)	Demo Yield (q/ha)	Check yield (q/ha)	% increase	Net return (Rs./ha)		% increase
							Demo	Check	
AGT 2	Dahod	25	10.00	11.20	8.50	31.76	36400	23570	54.43
GNP 2	Surat	5	2.50	13.77	11.50	19.74	41350	32250	28.22
GT 105	Dang, Surat	30	7.50	15.90	13.15	20.96	48900	38830	25.93
GT 104	Bharuch, Surat, Valsad	177	48.70	14.96	12.19	22.78	51421	38134	34.84
Vaishali	Navsari	10	5.00	10.85	8.90	21.91	34528	25018	38.01
<b>Total</b>		<b>247</b>	<b>73.70</b>	<b>13.19</b>	<b>10.73</b>	<b>22.93</b>	<b>43187</b>	<b>31670</b>	<b>37.71</b>

### Performance of Chickpea Varieties in Gujarat

Technology demonstrations of chickpea with GG-1, GG-2, GG-3, GG-4, GG-5, GJG-3, GJG-5, GJG-6 and local varieties were conducted on 127.5 ha area benefitting 352 farmers. Higher yield of 22.65 q/ha

was achieved under GG-3 cultivar in KVKs Panchmahal and Rajkot followed by GG-5 (19.68 q/ha) in Dang, Junagadh, Rajkot, Surendranagar and Tapi districts (Table 3.21). In Gujarat, chickpea yield was increased by 33.05 % over national and 1.15 % at state level (Fig. 3.7).


**Table 3.21 Yield wise performance of chickpea in Gujarat**

Variety	District/KVK	No. of Demos	Area (ha)	Demo Yield (q/ha)	Check yield (q/ha)	% increase	Net return (Rs./ha)		% increase
							Demo	Check	
GG 1/ Digvijay	Porbandar	10	4.00	17.96	16.50	8.85	72944	64519	13.06
GG 2	Anand, Kheda	29	15.00	14.26	12.19	16.98	37457	28421	31.79
GG 3	Panchmahal, Rajkot-II	20	6.50	22.65	18.40	23.10	39003	25562	52.58
GG 4	Bharuch	12	5.00	18.40	16.50	11.52	88600	78500	12.87
GG 5	Dang, Junagadh, Rajkot-I, Surendranagar, Tapi	136	41.00	19.68	16.25	21.11	74050	57402	29.00
GJG 3	Ahmedabad, Dahod	80	32.00	13.74	12.14	13.18	45800	38960	17.56
GJG 5	Bharuch	20	10.00	19.70	17.10	15.20	79790	64220	24.24
GJG 6	Morbi	10	4.00	16.52	14.81	11.55	51404	41912	22.65
Local	Dang	25	5.00	11.16	9.27	20.39	35252	27728	27.14
<b>Total</b>		<b>352</b>	<b>127.5</b>	<b>15.86</b>	<b>13.46</b>	<b>17.83</b>	<b>52578</b>	<b>41888</b>	<b>25.52</b>

## FLDs on Oilseeds

Different technology demonstrations on oilseed crops were conducted especially on groundnut (248), soybean (118), sesame (67), mustard (25) and castor (10) on 172 ha area at farmers' fields (Table 3.22). In groundnut, cropping system, ICM, IDM, INM, IPDM, IPM, organic farming and varietal components provided yield of 22.51 q/ha which was more as compared to farmer's practice (19.67 q/ha). Among above technologies, cropping system intervention gave highest yield of 29.54 q/ha in demonstration plots. In mustard, ICM related interventions contributed yield of 20.10 q/ha which was greater than local check (16.40 q/ha). In sesame, ICM, cropping system and varietal component gave yield of 6.25 q/ha which was higher over local practice (5.65



q/ha). In soybean, average yield of 15.95 q/ha was obtained with adoption of different package of practices like ICM, INM, IPM and improved varieties.

**Table 3.22 Thematic area wise physical achievements of FLDs on oilseed crops in Gujarat**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Castor	IDM	1	10	4.00	25.00	19.10	30.89	109600	74140
Groundnut	Cropping system	1	20	5.00	29.54	26.31	12.27	121409	102031
Groundnut	ICM	1	34	10.00	19.80	13.84	43.06	66986	32458
Groundnut	IDM	2	15	6.00	22.38	18.49	21.01	80916	58773
Groundnut	INM	3	47	14.00	21.13	18.41	14.76	61740	52596
Groundnut	IPDM	1	20	5.00	23.18	21.05	10.14	88765	75204
Groundnut	IPM	5	67	22.00	20.92	17.60	18.84	66389	51495
Groundnut	Organic Farming	1	10	4.00	18.25	18.96	-3.74	72528	68964
Groundnut	Varietal	4	35	14	24.865	22.6675	9.69	80828	63903
	<b>Sub-Total</b>		<b>248</b>	<b>80.00</b>	<b>22.51</b>	<b>19.67</b>	<b>14.45</b>	<b>79945</b>	<b>63178</b>
Mustard	ICM	1	25	10.00	20.10	16.40	22.56	99045	78608
Sesamum	Cropping Systems	1	10	4.00	2.37	2.05	16.09	9474	5731
Sesamum	Varietal	4	57	22.00	7.23	6.55	10.26	36452	26758
	<b>Sub-Total</b>		<b>67</b>	<b>26.00</b>	<b>6.25</b>	<b>5.65</b>	<b>10.68</b>	<b>31057</b>	<b>22552</b>
Soybean	ICM	1	38	15.00	10.10	8.30	21.69	15192	8630
Soybean	INM	1	22	10.00	17.80	12.64	40.82	39072	18697
Soybean	IPM	1	25	10.00	11.75	10.25	14.63	27375	22375
Soybean	Varietal	4	33	17.00	17.99	15.63	15.11	58019	44364
	<b>Sub-Total</b>		<b>118</b>	<b>52.00</b>	<b>15.95</b>	<b>13.39</b>	<b>19.11</b>	<b>44816</b>	<b>32451</b>
	<b>Grand Total</b>		<b>468</b>	<b>172</b>					



## Varietal Performance of Groundnut in Gujarat

Groundnut cultivars were demonstrated at farmers' fields and higher yield (30.32 q/ha) was obtained



under GJG-32 in Amreli, Morbi, Rajkot districts followed by GG-20 (24.21 q/ha) in Rajkot, Surendranagar and Tapi districts. Net profit of Rs. 79945/ha was earned by the farmers under demonstrations.

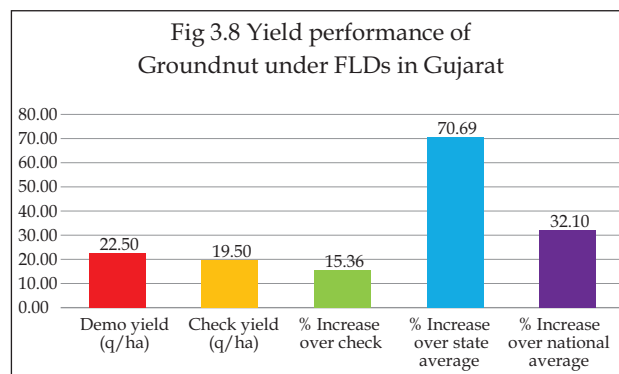
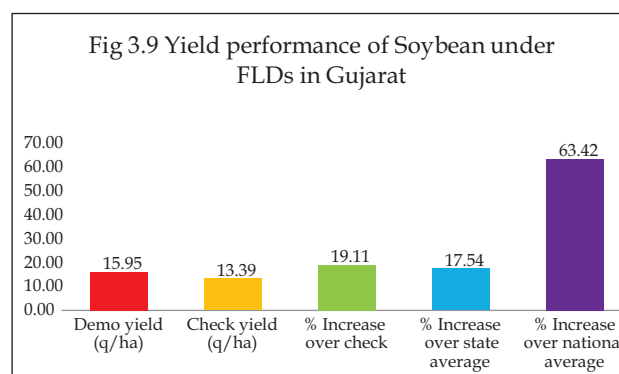


Table 3.23 Variety wise performance of groundnut in Gujarat

Variety	District/ KVK	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
GG-20	Rajkot II, Surendranagar, Tapi	59	20.00	24.21	19.03	27.23	85665	55975	53.04
GG-22	Rajkot-II	10	4.00	20.20	19.90	1.51	54023	44366	21.77
GJG-22	Amreli, Banaskantha-I, Junagadh, Porbandar	69	25.00	19.77	18.23	8.48	70172	58489	19.98
GJG-32	Amreli, Morbi, Rajkot- I	50	17.00	30.32	25.12	20.68	96240	78983	21.85
GJG-9	Surendranagar	10	4.00	13.36	12.16	9.87	52994	46598	13.73
TAG 22	Kheda	25	5.00	17.10	16.35	4.59	47339	42016	12.67
TAG 24	Kheda	25	5.00	17.54	16.67	5.22	48986	43328	13.06
Total		248	80.00	22.51	19.67	14.45	79945	63178	26.53

## Performance of Soybean Cultivars in Gujarat

Frontline demonstrations on soybean were conducted with improved varieties like GJS-3, JS 20-34, MACS-1188 and NRC-37 in Junagadh, Bharuch, Surat, Tapi, Vadodara and Dahod districts. GJS-3 variety performed well and provided higher yield of 19.50 q/ha followed by JS 20-34 with productivity of 18.95 q/ha. On an average, net gain of Rs. 44816/ha was realised by the farmers (Table 3.24). In Gujarat, soybean yield was increased by 63.42% over national and 17.54% at state level (Fig. 3.9).



**Table 3.24 Variety wise performance of soybean in Gujarat**

Variety	District/ KVK	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
GJS-3	Junagadh	5	2.00	19.50	16.00	21.88	44446	20230	119.70
JS 20-34	Bharuch	5	2.00	18.95	15.82	19.79	67198	51891	29.50
MACS-1188	Bharuch	11	8.00	16.62	15.70	5.83	55411	51285	8.04
NRC-37	Dahod, Surat, Tapi, Vadodara	97	40.00	14.14	11.55	22.43	36665	25938	41.36
<b>Total</b>		<b>118</b>	<b>52.00</b>	<b>15.95</b>	<b>13.39</b>	<b>19.11</b>	<b>44816</b>	<b>32451</b>	<b>38.10</b>

## Cereals and Millets

Different technology demonstrations were laid out at farmers' fields mainly on paddy (1619), wheat (389), finger millet (100), maize (35), bajra (10), jowar (49) and little millet (35) on 708.50 ha area (Table 3.25). In Bajra, INM gave yield of 22.07 q/ha whereas check plot gave yield of 20.70 q/ha. In finger millet, ICM gave yield of 11.75 q/ha which was more (24.80%) than local check (9.42 q/ha). In jowar, ICM component gave yield of 21.79 q/ha which was 17.57% higher as compared to local check (18.53 q/ha). In little millet, ICM and INM component provided yield of 11.91 q/ha as compared to 8.69

q/ha in local check with 37.08% increased yield. Among above technologies, ICM gave highest yield of 13.02 q/ha under demonstration plots. In paddy, technologies such as ICM, INM, IPDM, IPM, nursery management and varietal introduction gave yield of 42.75 q/ha as compared to 38.41 q/ha in local check with 11.32% increase in yield. IPDM component gave highest yield of 53.39 q/ha in demo plot. In wheat, technologies such as ICM, INM, IPM, IWM and improved varieties gave yield of 40.72 q/ha as compared to 34.82 q/ha in local check with 16.96% increase. Among above technologies, IWM gave highest yield of 43.20 q/ha in demonstration plots as compared to local check (28 q/ha).

**Table 3.25 Thematic area wise physical achievements of FLDs on cereal and millet crops in Gujarat**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Bajra	INM	1	10	1.00	22.07	20.70	6.62	15784	7647
Finger millet	ICM	2	100	20.00	11.75	9.42	24.80	24265	17518
Jowar	ICM	1	49	20.00	21.79	18.53	17.57	43010	31025
Little millet	ICM	1	25	5.00	13.02	9.72	33.95	27758	16300
Little millet	INM	1	10	1.00	10.79	7.65	41.05	13738	8380
<b>Subtotal</b>			<b>35</b>	<b>6.00</b>	<b>11.91</b>	<b>8.69</b>	<b>37.08</b>	<b>20748</b>	<b>12340</b>

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Maize	IDM	1	10	2.50	32.40	26.25	23.43	31840	22900
Maize	IPM	1	25	10.00	18.50	15.80	17.09	23450	17780
	<b>Subtotal</b>		<b>35</b>	<b>12.50</b>	<b>25.45</b>	<b>21.03</b>	<b>21.05</b>	<b>27645</b>	<b>20340</b>
Paddy	ICM	7	1324	407.00	41.03	35.19	16.57	44857	31641
Paddy	INM	2	45	7.00	39.81	38.17	4.30	37758	33228
Paddy	IPDM	1	10	4.00	53.39	47.30	12.88	36172	28124
Paddy	IPM	7	150	48.50	42.26	37.30	13.29	37406	28489
Paddy	Nursery Management	1	20	1.50	35.70	33.67	6.03	32494	25931
Paddy	Varietal	4	70	37.00	44.33	38.80	14.24	48793	39046
	<b>Subtotal</b>		<b>1619</b>	<b>505.00</b>	<b>42.75</b>	<b>38.41</b>	<b>11.32</b>	<b>39580</b>	<b>31077</b>
Wheat	ICM	1	12	5.00	35.80	27.50	30.18	46260	30100
Wheat	INM	7	157	58.00	40.44	35.47	14.02	49385	135677
Wheat	IPM	2	50	10.00	37.16	34.45	7.87	41164	35133
Wheat	IWM	1	4	10.00	43.20	28.00	54.29	53630	29750
Wheat	Varietal	8	166	61.00	41.88	35.85	16.81	54017	40004
	<b>Subtotal</b>		<b>389</b>	<b>144.00</b>	<b>39.70</b>	<b>32.25</b>	<b>23.07</b>	<b>48891</b>	<b>54133</b>
	<b>Grand Total</b>		<b>2237</b>	<b>708.50</b>					

## Commercial Crops

Technology demonstrations under sugarcane were taken up covering 32 farmers on 9 ha area at farmers' fields (Table 3.26). Under different components of ICM, INM, IPM and IWM, mean yield of 924.47 q/ha was obtained which was 10.01% higher over local check (840.38 q/ha) with net profit of Rs. 129318/ha. Under IPM component, highest yield of 1047 q/ha was attained against local check yield of 964 q/ha.



**Table 3.26 Thematic area wise physical achievements of FLDs on commercial crops in Gujarat**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Sugarcane	INM	1	5	1.00	915.20	844.50	8.37	110066	91890
Sugarcane	IPM	1	12	5.00	1046.66	964.00	8.57	164467	148918
Sugarcane	IWM	1	5	2.00	911.00	798.00	14.16	123032	95237
	<b>Grand Total</b>		<b>32</b>	<b>9.00</b>	<b>924.47</b>	<b>840.38</b>	<b>10.01</b>	<b>129318</b>	<b>107768</b>

## Fodder Crops

Fodder crops played an important role towards livestock management and gave higher milk yield. Different frontline demonstrations on sorghum (105), oat (60), barley (10), napier (27), maize (11) and

lucerne (10) were conducted covering an area of 38.60 ha at farmers' fields (Table 3.27). In sorghum, average yield of 781.67 q/ha was obtained under varietal component which proved superior to local check (715.33 q/ha). In oat, improved variety gave yield of



516 q/ha with net profit of Rs. 57236/ha. In napier, varietal component reported yield of 2470 q/ha which was greater as compared to local check (2140

q/ha). In lucerne, varietal component gave yield of 405 q/ha which was higher (19.12%) over farmer's practice (340 q/ha).

**Table 3.27 Thematic area wise physical achievements of FLDs on fodder crops in Gujarat**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Barley	Varietal	1	10	4.00	495.00	430.50	14.98	63800	52600
Lucerne	Varietal	1	10	1.00	405.00	340.00	19.12	81250	67500
Maize	Varietal	1	11	4.40	321.60	273.80	17.46	55900	45059
Napier	Varietal	1	27	2.70	2470	2140	15.42	131500	111600
Oat	Varietal	2	60	9.00	516.00	439.50	17.41	57236	45350
Sorghum	Varietal	3	105	17.50	781.67	715.33	9.27	87057	73480
<b>Grand Total</b>			<b>223</b>	<b>38.60</b>					

## Fruit Crops

In horticultural crops, demonstrations on banana (60), lime (15) mango (322), muskmelon (4) and watermelon (20) were conducted on 172.65 ha area at farmers' fields (Table 3.28). In banana, INM and IPDM gave yield of 824.83 q/ha which was greater than local

check (752.29 q/ha). In mango, technologies such as INM, IPDM, IPM and varietal demonstrations gave yield of 75.98 q/ha and found good over check (67.88). In watermelon, technologies such as Resource Conservation Technologies and ICM gave yield of 412 q/ha and found good over check (308.80 q/ha).



**Table 3.28 Thematic area wise physical achievements of FLDs on fruit crops in Gujarat**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Banana	INM	3	50	21.00	870.93	793.78	9.72	532311	460846
Banana	IPDM	1	10	4.00	686.52	627.82	9.35	364364	326474
	<b>Subtotal</b>		<b>60</b>	<b>25.00</b>	<b>824.83</b>	<b>752.29</b>	<b>9.64</b>	<b>490324</b>	<b>427253</b>
Lime	INM	1	15	6.00	53.20	46.10	15.40	137000	110800
Mango	INM	1	166	66.40	93.50	85.00	10.00	168550	150500
Mango	IPDM	2	20	8.00	77.43	72.73	6.47	102404	94441
Mango	IPM	2	22	9.00	57.00	51.42	10.86	168575	134213
Mango	Varietal	1	114	50.00	93.50	74.00	26.35	274000	206000
	<b>Subtotal</b>		<b>322</b>	<b>133.40</b>	<b>75.98</b>	<b>67.88</b>	<b>11.93</b>	<b>164085</b>	<b>135635</b>

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Banana	INM	3	50	21.00	870.93	793.78	9.72	532311	460846
Banana	IPDM	1	10	4.00	686.52	627.82	9.35	364364	326474
	<b>Subtotal</b>		<b>60</b>	<b>25.00</b>	<b>824.83</b>	<b>752.29</b>	<b>9.64</b>	<b>490324</b>	<b>427253</b>
Lime	INM	1	15	6.00	53.20	46.10	15.40	137000	110800
Mango	INM	1	166	66.40	93.50	85.00	10.00	168550	150500
Mango	IPDM	2	20	8.00	77.43	72.73	6.47	102404	94441
Mango	IPM	2	22	9.00	57.00	51.42	10.86	168575	134213
Mango	Varietal	1	114	50.00	93.50	74.00	26.35	274000	206000
	<b>Subtotal</b>		<b>322</b>	<b>133.40</b>	<b>75.98</b>	<b>67.88</b>	<b>11.93</b>	<b>164085</b>	<b>135635</b>
Muskmelon	ICM	1	4	1.00	248.50	226.50	9.71	148970	110350
Watermelon	Resource Conservation Technologies	1	5	1.25	367.00	214.00	71.50	133720	53260
Watermelon	ICM	1	15	6.00	457.00	403.60	13.23	406903	348612
	<b>Sub total</b>		<b>20</b>	<b>7.25</b>	<b>412.00</b>	<b>308.80</b>	<b>33.42</b>	<b>270312</b>	<b>200936</b>
	<b>Grand Total</b>		<b>421</b>	<b>172.65</b>					

## Spices Crops

Under spices, ajwain (45), coriander (68), cumin (185), dilseed (10), fennel (146), fenugreek (5), ginger (55) and turmeric (8) were demonstrated covering an area of 188.60 ha in the farmers' fields (Table 3.29). Ajwain gave the yield of 10.86 q/ha in demo plot and 9.70 q/ha in check plot. In coriander, ICM, IDM and varietal introduction provided a yield of 13.95 q/ha with net profit of Rs. 64419/ha. In cumin ICM, IDM, INM and IPM provided yield of 9.12 q/ha which was higher over local check (7.98 q/ha) with net economic gain of Rs. 80281/ha. Among above technologies, IPM gave highest yield of 11.69 q/ha in demonstration plots. In Dilseed 8.70 q/ha yield was observed in demo plot and 7.40 q/ha in check plot. In fennel, ICM,



IPM and varietal introduction gave yield of 17.45 q/ha which was greater than local check (14.82 q/ha). Among above technologies, IPM gave highest yield of 19.15 q/ha in demonstration plots.

**Table 3.29 Thematic area wise physical achievements of FLDs on spices crops in Gujarat**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Ajwain	ICM	2	45	18.00	10.86	9.70	11.96	103219	89810
Coriander seed	ICM	2	32	13.00	14.56	13.31	9.39	63032	49357
Coriander seed	IDM	2	26	10.40	14.38	12.16	18.26	80029	60049
Coriander seed	Varietal	1	10	4.00	11.87	10.03	18.34	35972	23587
	<b>Subtotal</b>		<b>68</b>	<b>27.40</b>	<b>13.95</b>	<b>12.19</b>	<b>14.44</b>	<b>64419</b>	<b>48480</b>

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Cumin	ICM	3	70	23.00	8.61	7.79	10.53	69407	52147
Cumin	IDM	7	95	38.00	9.49	8.29	14.48	87987	73519
Cumin	INM	1	10	4.00	6.70	6.10	9.84	52450	47350
Cumin	IPM	1	10	4.00	11.69	9.73	20.14	111280	89526
	<b>Subtotal</b>		<b>185</b>	<b>69.00</b>	<b>9.12</b>	<b>7.98</b>	<b>14.35</b>	<b>80281</b>	<b>65636</b>
Dilseed	ICM	1	10	4.00	8.70	7.40	17.57	37000	30400
Fennel	ICM	1	25	10.00	15.40	12.90	19.38	74650	58175
Fennel	IPM	1	25	10.00	19.15	16.85	13.65	134295	106665
Fennel	Varietal	3	96	27.00	17.80	14.71	21.03	86479	65240
	<b>Subtotal</b>		<b>146</b>	<b>47.00</b>	<b>17.45</b>	<b>14.82</b>	<b>17.75</b>	<b>98475</b>	<b>76693</b>
Fenugreek	Varietal	1	5	2.00	23.40	20.50	14.15	63780	52800
Ginger	Varietal	1	55	21.30	180.00	155.00	16.13	167500	127500
Turmeric	ICM	1	8	0.16	216.00	176.00	22.73	118300	98300
	<b>Grandtotal</b>		<b>522</b>	<b>188.86</b>					

## Tuber Crops

In tuber crops, demonstrations on Elephant footyam (30), potato (40) and sweet potato (13) were conducted covering an area of 14.60 ha in the farmers' field conditions (Table 3.30). In Elephant footyam technologies like ICM and varietal introduction were demonstrated at farmer's field in which 286.47 q/ha yield was obtained from demo plot and 252.48 q/ha yield from check plot. In potato, INM component gave yield of 301.20 q/ha which showed superiority over existing practice (255.20 q/ha). Sweet potato gave average yield of 238.05 q/ha with net profit of Rs. 305757/ha.



**Table 3.30 Thematic area wise physical achievements of FLDs on tuber crops in Gujarat**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Elephant footyam	ICM	1	5	1.00	265.43	229.96	15.42	241853	201756
Elephant footyam	Varietal	1	25	0.60	307.50	275.00	11.82	196250	157500
	<b>Subtotal</b>		<b>30</b>	<b>1.60</b>	<b>286.47</b>	<b>252.48</b>	<b>13.46</b>	<b>219052</b>	<b>179628</b>
Potato	INM	1	40	10.00	301.20	255.20	18.03	168000	112000
Sweet Potato	ICM	2	13	3.00	238.05	214.85	10.80	305757	250807
	<b>Grandtotal</b>		<b>83</b>	<b>14.60</b>					



## Vegetable Crops

A total of 794 frontline demonstrations in which 20 bitter gourd, 150 brinjal, 50 cabbage, 26 green chilli, 14 cluster bean, 25 coccinia, 25 coriander leaf, 192 dolichos bean, 69 demonstrations on little guard, 93 okra, 50 onion and 80 tomato were conducted covering 190.46 ha area at farmers' fields (Table 3.31). In brinjal, ICM, IDM, INM, IPDM and IPM gave yield of 212.64 q/ha which was greater than existing practice (188.37 q/ha). Among above technologies, INM gave highest yield of 254.48 q/ha under demonstration plots. In cabbage, IPM component provided yield of 332 q/ha. In green chilli, IDM and varietal components gave yield of 173.50 q/ha. In

cluster bean, varietal introduction gave yield of 86.30 q/ha which was more than local check (70.40 q/ha) with 22.59 % increase. In okra, IDM, IPDM, IPM and varietal introduction provided yield of 122.26 q/ha which was higher as compared to local check (111.08 q/ha). In onion, IDM, INM, IPM and varietal introduction gave yield of 260.22 q/ha which was more than local check (234.73 q/ha). Among above technologies, varietal introduction gave highest yield of 308.21 q/ha in demonstration plots. In tomato, technologies such as INM and improved varieties harvested yield of 337.64 q/ha which showed better performance as compared to existing practice (312.44 q/ha). INM component in tomato attained highest yield of 428.38 q/ha over the local check (403.22 q/ha).



**Table 3.31 Thematic area wise physical achievements of FLDs on vegetable crops in Gujarat**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Bitter gourd	IPM	1	20	2.00	88.40	69.85	26.56	135640	98125
Brinjal	ICM	1	20	2.00	163.21	131.06	24.53	167141	127807
Brinjal	IDM	1	16	6.00	244.70	222.40	10.03	34128	25876
Brinjal	INM	4	55	17.00	254.48	235.84	7.90	163596	140445
Brinjal	IPDM	1	20	8.00	186.61	166.26	12.24	243369	209775
Brinjal	IPM	4	39	20.50	196.32	167.97	16.88	124233	102544
	<b>Subtotal</b>		<b>150</b>	<b>53.50</b>	<b>212.64</b>	<b>188.37</b>	<b>12.88</b>	<b>149128</b>	<b>125020</b>
Cabbage	IPM	2	50	10.00	332.00	328.00	1.22	204317	198705
Chilli green	IDM	1	16	6.00	237.00	213.00	11.27	25440	16960
Chilli green	Varietal	1	10	4.00	110.00	95.10	15.67	150000	122680
	<b>Subtotal</b>		<b>26</b>	<b>10.00</b>	<b>173.50</b>	<b>154.05</b>	<b>12.63</b>	<b>87720</b>	<b>69820</b>
Clusterbean	Varietal	1	14	5.60	86.30	70.40	22.59	24854	16217
Coccinia	IPM	1	25	5.00	330.00	325.00	1.54	286516	276529
Coriander leaf	Varietal	1	25	6.00	32.60	25.40	28.35	55830	46306
Dolichos bean	ICM	4	139	14.66	32.91	25.56	28.76	79381	59278

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Dolichos bean	Varietal	1	53	16.00	33.60	25.10	33.86	94770	64800
	<b>Subtotal</b>		<b>192</b>	<b>30.66</b>	<b>33.26</b>	<b>25.33</b>	<b>31.29</b>	<b>87076</b>	<b>62039</b>
Little gourd	ICM	1	10	0.50	203.56	172.56	17.96	142560	109560
little gourd	INM	1	10	2.00	145.67	114.95	26.72	236551	171115
little gourd	Varietal	2	49	2.20	162.50	139.10	16.82	254700	212050
	<b>Subtotal</b>		<b>69</b>	<b>4.70</b>	<b>170.58</b>	<b>142.20</b>	<b>19.95</b>	<b>211270</b>	<b>164242</b>
Okra	IDM	1	10	4.00	148.00	136.00	8.82	278000	241800
Okra	IPDM	1	16	4.00	114.58	105.00	9.12	242845	206000
Okra	IPM	2	37	10.00	103.96	93.20	11.55	97479	84270
Okra	Varietal	2	30	8.00	122.50	110.12	11.24	201370	169110
	<b>Subtotal</b>		<b>93</b>	<b>26.00</b>	<b>122.26</b>	<b>111.08</b>	<b>10.06</b>	<b>204924</b>	<b>175295</b>
Onion	IDM	1	10	4.00	292.13	265.75	9.93	111190	81034
Onion	INM	2	15	6.00	238.55	220.00	8.43	162279	141455
Onion	IPM	1	5	2.00	202.00	190.00	6.32	173270	157510
Onion	Varietal	2	20	3.00	308.21	263.17	17.11	150698	129448
	<b>Subtotal</b>		<b>50</b>	<b>15.00</b>	<b>260.22</b>	<b>234.73</b>	<b>10.86</b>	<b>149359</b>	<b>127362</b>
Tomato	INM	2	40	13.00	428.38	403.22	6.24	373517	321491
Tomato	Varietal	3	40	9.00	246.89	221.66	11.38	153057	128887
	<b>Subtotal</b>		<b>80</b>	<b>22.00</b>	<b>337.64</b>	<b>312.44</b>	<b>8.07</b>	<b>263287</b>	<b>225189</b>
	<b>Grand total</b>		<b>794</b>	<b>190.46</b>					

## Hybrid Crops

More attention on promoting hybrids under different crops for getting higher productivity was given by KVKs in the zone. Frontline demonstrations on bajra (45), bajra fodder (20), bitter gourd (25), brinjal (30), castor (118), chilli green (30), cotton (325), cowpea (40), cucumber (20), maize (45) okra (20), paddy (130) and tomato (58) were conducted covering an area of 308.50 ha at farmers' fields (Table 3.32). In paddy, technological intervention such as ICM gave yield of 52.91 q/ha which was higher (21.69%) over check (43.48 q/ha). In okra, technologies such as INM and IPDM provided mean yield of 174.44 q/ha which was more than check (153 q/ha). In tomato, interventions



like ICM, IPM and hybrid reported yield of 455.12 q/ha which was greater than existing practice (398 q/ha).

**Table 3.32 Thematic area wise physical achievements of FLDs on hybrid crops in Gujarat**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Bajra	Hybrid	3	45	12.00	36.33	34.87	4.19	36912	27700
Bajra (Fodder)	INM	1	20	5.00	380.00	350.00	8.57	26270	21650

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Bittergourd	ICM	1	25	2.50	215.36	177.92	21.04	123320	88500
Brinjal	Hybrid	2	30	8.00	282.88	231.25	22.33	169485	132413
Castor	ICM	2	85	34.00	31.71	27.94	13.49	120683	98284
Castor	INM	1	33	18.00	31.70	28.50	11.23	106935	91475
	<b>Subtotal</b>		<b>118</b>	<b>52.00</b>	<b>31.71</b>	<b>28.12</b>	<b>12.35</b>	<b>113809</b>	<b>94880</b>
Chilli green	Hybrid	2	30	8.00	125.40	96.30	30.22	114340	78640
Cotton	Hybrid	3	40	13.00	14.97	12.93	15.78	58950	46697
Cotton	ICM	3	60	24.00	17.96	14.33	25.33	60558	30352
Cotton	INM	3	45	18.00	18.08	16.20	11.60	101004	79342
Cotton	IPDM	1	30	7.50	21.75	19.11	13.81	147220	118311
Cotton	IPM	7	150	61.50	18.59	16.58	12.12	99741	84804
	<b>Subtotal</b>		<b>325</b>	<b>124.00</b>	<b>18.27</b>	<b>15.86</b>	<b>15.41</b>	<b>93495</b>	<b>71901</b>
Cowpea	INM	1	40	10.00	41.80	38.30	9.14	98000	76000
Cucumber	INM	1	20	5.00	104.00	89.30	16.46	119600	78000
Maize	Hybrid	1	25	10.00	18.05	14.90	21.14	19835	6917
Maize	ICM	1	10	5.00	23.80	20.30	17.24	32160	24200
Maize	IPM	1	10	5.00	24.20	20.40	18.63	30520	21440
	<b>Subtotal</b>		<b>45</b>	<b>20.00</b>	<b>22.02</b>	<b>19.00</b>	<b>18.79</b>	<b>27505</b>	<b>17519</b>
Okra	INM	1	10	4.00	173.58	154.23	12.55	179149	145250
Okra	IPDM	1	10	4.00	175.30	152.09	15.26	166221	131627
	<b>Subtotal</b>		<b>20</b>	<b>8.00</b>	<b>174.44</b>	<b>153.00</b>	<b>13.89</b>	<b>172685</b>	<b>138439</b>
Paddy	ICM	4	130	39.00	52.91	43.48	21.69	61009	46591
Tomato	Hybrid	2	22	7.00	377.75	316.90	19.20	420700	278300
Tomato	ICM	2	24	3.00	367.62	327.62	12.21	165759	130409
Tomato	IPM	1	12	5.00	620.00	548.00	13.14	487932	343728
	<b>Subtotal</b>		<b>80</b>	<b>22</b>	<b>455.12</b>	<b>398.00</b>	<b>14.49</b>	<b>358130</b>	<b>250812</b>
	<b>Grand Total</b>		<b>906</b>	<b>308.50</b>					

## Livestock and Fisheries

Integrating livestock and fisheries as components in integrated farming system models is very important for sustainable agriculture and livelihood security. In this context, KVKs had demonstrated different interventions on different components. A total of 2592 demonstrations (1429-dairy buffalo; 3534-dairy cow; 80 in goat; 400 in poultry and 20 in fisheries) were conducted covering 5463 livestock (Table 3.33). In dairy buffalo and cow, technologies such as area specific mineral mixture, probiotics, fodder, rumen





bypass fat, urea treatment, chaff cutting, ration balancing, management of mastitis, management of infertility etc. provided higher yield over respective local checks. In sheep and goat, technologies such as deworming, ration balancing, mineral mixture, parasite management, IDM etc. gave higher yield

over respective local checks. In case of poultry, technologies such as improved breeds gave higher yield over respective local check. In case of fishery, technologies such as Catla, Rohu, Grass carp, Common carp, IFS, composite culture etc. performed well as compared to local check.

**Table 3.33 Frontline demonstrations on livestock and fisheries conducted by KVKs of Gujarat**

Livestock	Thematic Area	KVK	Demos (No.)	Livestock (No.)	Unit of Yield	Intervention	Check	% Increase over Check
Dairy Buffalo	Breeding Management	1	20	20	Fertility rate %	65.00	20.00	225.00
	Breeding Management	1	20	60	Conception rate %	0.35	0.00	0.00
	Disease Management	3	258	446	Milk yield L/anim./day	7.16	6.42	11.53
	Nutrition Management	1	30	60	Conception rate %	80.00	50.00	60.00
	Nutrition Management	1	20	20	Fertility rate %	70.00	15.00	366.67
	Nutrition Management	2	35	95	kg/animal	205.13	152.20	34.77
	Nutrition Management	10	451	688	Milk yield L/anim./day	8.69	7.58	14.64
	Nutrition Management	1	30	30	Numbers	74.00	146.00	-49.32
	Nutrition Management	1	10	10	q/ha	930.00	610.00	52.46
	<b>Sub-Total</b>		<b>874</b>	<b>1429</b>				
Dairy Cow	Breeding Management	1	50	50	Conception rate %	46.97	36.00	30.47
	Disease Management	1	335	1005	Milk yield L/anim./day	7.20	6.80	5.88
	Disease Management	1	40	40	Morbidity rate %	2.00	8.00	-75.00
	Disease Management	1	50	150	No. of ectoparasites/sq inch	1.00	4.00	-75.00
	Nutrition Management	11	948	2054	Milk yield L/anim./day	10.80	9.40	14.89
	Nutrition Management	1	100	100	Numbers	243.50	299.50	-18.70
	Nutrition Management	1	110	110	q/ha	442.50	250.00	77.00
	Production and Management	1	25	25	Milk yield L/anim./day	2.90	2.40	20.83
	<b>Sub-Total</b>		<b>1658</b>	<b>3534</b>				
Fishery	Production and Management	2	20	20	q/ha	5.51	4.28	28.74
Goat	Disease Management	1	20	80	Mortality rate %	16.80	14.20	18.31
Poultry	Breeding Management	1	20	400	kg/bird	1.20	1.13	6.19
	<b>Grand-Total</b>		<b>2592</b>	<b>5463</b>				

## Goa

### Crops

Different technology demonstrations were laid out at farmers' fields especially on paddy (8) on 2 ha area. In paddy, technologies such as improved variety gave yield of 20.9 q/ha as compared to 13.2 q/ha in local check with 58.33% increase. In black pepper, technologies such as IDM gave yield of 4.56 q/ha as compared to 3.44 q/ha in local check with 32.56% increase with net profit of Rs. 77752/ha (Table 3.34). In vegetable crops like dry chilli, 10 demonstrations were laid out with average yield of 7.5 q/ha as

compared to check (5.6 q/ha). In green chilli, 10 demonstrations were laid out with average yield of 25 q/ha and check yield of 21 q/ha. 5 demonstrations for cluster bean were taken in Goa in which yield of 20 q/ha and check yield of 14 q/ha was obtained. In cow pea, varietal and ICM component provided 8.45 q/ha yield against 4.7 q/ha of local yield. In sweet corn, 10 varietal demonstrations provided yield of 70 q/ha against 60.42 q/ha of local check yield. 65.6 q/ha of yield in demonstration plots and 52.7 q/ha yield in check plots was observed for Watermelon crop for varietal component.

**Table 3.34 Thematic area wise physical achievements of FLDs on crops in Goa**

Crop	Thematic Area	KVK	Farmers	Area (ha)	Demo yield (q/ha)	Check yield (q/ha)	% Increase	Net returns (Rs/ha)	
								Demo	Check
Black pepper	IDM	1	10	1	4.56	3.44	32.56	77752	64248
Chilli (Dry)	IDM	1	10	1	7.5	5.6	33.93	208500	90000
Chilli (Green)	IPDM	1	10	1	25	21	19.05	501440	182495
Cluster bean	Organic Farming	1	5	0.0025	20	14	42.86	40000	26000
Cowpea	Varietal, ICM	2	20	1.5	8.45	4.7	79.79	64297	62750
Paddy	Varietal	1	8	2	20.9	13.2	58.33	35220	13790
Sweet Corn	Varietal	1	10	0.5	70	60.42	15.86	166701	134776
Watermelon	Varietal	1	10	0.5	65.6	52.7	24.48	609744	452891
	<b>Total</b>		<b>83</b>	<b>7.5025</b>					

### Livestock and Fisheries

A total of 18 demonstrations in fishery covering 12001 fish seeds were conducted in the farmers' fields (Table

3.35). Technologies such as production and management gave higher yield (450.60 kg) over respective local check (267 kg) by 68.76%.

**Table 3.35 Frontline demonstrations on livestock & fisheries conducted by KVKs of Goa**

Livestock	Thematic Area	KVK	Demos (No.)	Livestock (No.)	Unit of Yield	Intervention	Check	% Increase over Check
Fishery	Production and Management	1	18	12001	kg of fish	450.60	267.00	68.76

### Farm Implements

A total of 1974 demonstrations (1405 in Maharashtra and 569 in Gujarat) were organized on farm implements. In chickpea, major implements demonstrated were Bullock drawn CRIDA planter, Tractor operated BBF Planter and Tractor Drawn Multicrop Planter. In cotton, major implements

demonstrated were Mobile Shredder for bio mass utilization, Cotton Slasher, Subsoiler, Ridger, Shredder, Bullock Drawn Plough and Drip lateral coiler. In paddy, major implements demonstrated were Bullock drawn Three tyne weeder, Mini Rice mill, Paddy Drum Seeder, Seed Cum Fertilizer Drill, Combine harvester for paddy, Stubble collector for paddy straw, Laxmi sickles, Vertical conveyor reaper,

Cono weeder, Self-propelled paddy reaper and Paddy Thresher. The crop-wise and state-wise details



of farm implements demonstrated are given in Table 3.36.



**Table 3.36 Implements used by the KVKs with number of demonstrations**

Crop	Implement/equipment used	No. of KVKs	No. of Demos
<b>Maharashtra</b>			
Brinjal	Manual seedling transplanter	1	15
Chickpea	Bullock drawn CRIDA planter, Tractor operated BBF Planter, Tractor Drawn Multicrop Planter	4	87
Chilli dry	Solar tunnel dryer	1	10
Chilli green	Rotary tiller	1	13
Cotton	Mobile Shredder for bio mass utilization, Cotton Slasher, Subsoiler, Ridger, Shredder, Bullock Drawn Plough, Drip lateral coiler	4	180
Curryleaf	Bamboo Solar dryer	1	13
Custard apple	Deseeding machine	1	15
Drumstick	Phule Drum Stick Harvester	2	35
Finger millet	Mini Thresher, Vivek millet thresher cum peeler	2	36
Groundnut	Groundnut Stripper, Groundnut decorticator, BBF Planter, Groundnut Decorticator, Mogi Wheel Hoe	4	95
Jowar	Animal drawn Stubble collector, Twin wheel hoe	2	35
Lime	Lemon Harvester	2	25
Maize	Hand operated Maize sheller	1	14
Mulberry	CSRTI-Cocoon Harvester	1	20
Onion	manually operated walk behind type boom sprayer, Solar conduction dryer	2	23
Paddy	Bullock drawn Three tyne weeder, Mini Rice mill, Paddy Drum Seeder, Seed Cum Fertilizer Drill, Combine harvester for paddy, Stubble collector for paddy straw, Laxmi sickles, Vertical conveyor reaper, Cono weeder, Self propelled paddy reaper, Paddy Thresher	8	302
Pigeonpea	Grain cleaner cum grader	1	10
Soybean	B/D solar sprayer, BBF Planter, CRIDA Planter, Serrated Sickle, Soybean mitten, Spiral Separator,	17	349
Sugarcane	Tractor Operated Trash Mulcher, Tractor Operated Ratoon Management Device	2	50
Tomato	Manual vegetable seedling transplanter & seedling carrier	2	20
Wheat	Wheat Reaper & Binder, Zero till drill, Supergrain bag, Sulbha bags	5	58
	<b>Total</b>		<b>1405</b>



Crop	Implement/equipment used	No. of KVKs	No. of Demos
<b>Gujarat</b>			
Castor	Dibbler	2	26
Cotton	Cotton shredder, Dibbler, Cotton Picking Apron, Drip irrigation	5	54
Dairy Cattle	Revolving Milking Stool and Stand	4	30
Fodder Sorghum	Chaff cutter	1	20
Greengram	Twin wheel hoe weeder	1	15
Groundnut	Wheel hoe	1	10
Mango	Power Sprayer	1	5
Okra	Bhindi Plucker, Twin wheel hoe weeder	2	75
Paddy	Paddy thresher, Mini rice mill	3	67
Pigeonpea	Twin wheel hoe weeder, Rake for collecting garbage/ harvesting, Stalk Puller for uprooting crop stalks	4	225
Soybean	Spiral seed Separator	1	15
Tomato	Twin wheel hoe weeder	1	22
Wheat	Seed cum fertilizer drill	1	5
	<b>Total</b>		<b>569</b>
	<b>Grand Total</b>		<b>1974</b>

## Other Enterprises

A total of 3255 demonstrations (2028 in Maharashtra, 1207 in Gujarat and 20 in Goa) were organized on other enterprises such as mushroom production, nutrition garden, drudgery reduction, vermi compost, storage loss minimization techniques and processing and value addition in crops, introduction of soya nuts for eradication of malnutrition among

pre-schoolers, preparation of Iron and B-Carotene rich bajra cookies, finger millet biscuit etc. Demonstrations were also conducted on production and management of mushroom, nutrition garden for income generation mainly for farm women by the KVKs of Maharashtra and Gujarat through establishment of SHGs and production units during the year. The enterprise-wise and state-wise details are given Table 3.37.



Table 3.37 Enterprises demonstrated by KVKs

Enterprise	No. of KVKs	No. of Demonstrations
<b>Maharashtra</b>		
Drudgery Reduction	3	150
Mushroom Production	4	83
Nutrition Garden	18	1143
Nutrition security	5	244
Post Harvest Technology	3	49
Processing and Value addition	10	239
Production and Management	2	25
Storage loss minimization techniques	3	95
<b>Total</b>		<b>2028</b>
<b>Gujarat</b>		
Drudgery reduction	2	10
Mushroom production	2	78
Natural Resource Conservation Technology- solar cooker	2	20
Nutrition Garden	16	1051
Processing and Value Addition	1	10
Vermicompost	3	38
<b>Total</b>		<b>1207</b>
<b>Goa</b>		
Nutrition Garden	1	10
Nutritional Security	1	5
Utilization of Kitchen Waste using Stack Composter	1	5
<b>Total</b>		<b>20</b>
<b>Grand Total</b>		<b>3255</b>

## Cluster Frontline Demonstrations

### Cluster Frontline Demonstrations of Pulses under NFSM

Cluster Frontline Demonstrations of Pulses under NFSM 2021 was sanctioned by Ministry of Agriculture & Farmers Welfare, Government of India with an aim to enhance the pulses production in the country. ICAR-ATARI, Pune implemented the project on major pulse crops viz. pigeon pea, chickpea, black gram, horse gram, cowpea and green gram in selected districts through respective KVKs in the states of Maharashtra and Gujarat during year 2021. Details of cluster frontline demonstrations are presented as under:

### Target and Achievements

#### Target

A target of 5990 cluster frontline demonstrations was fixed with coverage of 2396 ha of area in the states of Maharashtra and Gujarat, which was approved for kharif, rabi and summer seasons during 2021. Out of which 2350 demonstrations with coverage of area 940 ha for crops viz., green gram, black gram and pigeon pea in kharif season, 3040 demonstrations in an area of 1216 ha for crops viz., chickpea, horse gram & cowpea during rabi season, and 600 cluster frontline demonstrations with area of 240 ha on green gram during summer were proposed.

#### Achievements

In total, 5740 demonstrations were laid out in cluster mode on 2296 ha area out of targeted 5990 CFLDs (2396) ha.

**(I) Kharif Season:** A total of 2100 technology demonstrations were conducted on three pulse crops viz., green gram, black gram and pigeon pea in an area of 840 ha covering two states Maharashtra and Gujarat.

**(a) Green gram:** Cluster FLDs were implemented in an area of 140 ha with the involvement of 350 farmers in Maharashtra.

**(b) Black gram:** Cluster FLDs were implemented in an area of 110 ha with the involvement of 275 farmers of which 70 ha with 175 farmers in Maharashtra and 40 ha with 100 farmers in Gujarat.

**(c) Pigeon pea:** Cluster FLDs were laid out in an area of 590 ha with participation of 1475 farmers of which 480 ha with 1200 farmers in Maharashtra and 110 ha with 275 farmers in Gujarat.

**(ii) Rabi Season:** For making larger impact in the area, 2990 demonstrations were conducted in cluster mode on three pulse crops viz., chickpea, horse gram and cowpea in an area of 1196 ha covering two states Maharashtra and Gujarat.

**(a) Chickpea:** Cluster FLDs were implemented in an area of 1146 ha with the involvement of 2865 farmers, out of which 826 ha with 2065 farmers in Maharashtra and 320 ha with 800 farmers in Gujarat.

**(b) Horse gram:** Cluster FLDs were laid out in area of 40 ha with the involvement of 100 farmers in Maharashtra.

**(c) Cowpea:** Cluster FLDs were conducted in area of 10 ha with the involvement of 25 farmers in Maharashtra.

**(iii) Summer Season:** A total of 650 technology demonstrations were conducted on green gram in an area of 260 ha covering two states Maharashtra and Gujarat.

**(a) Green gram:** The allocation of area is as follows 10 ha with 25 farmers in Maharashtra and 250 ha with 625 farmers in Gujarat.

Abstract of approved CFLDs on pulses under NFSM and their achievements during 2021 is presented in Table 3.38.

**Table 3.38 Abstract of approved cluster FLDs on pulses under NFSM and their achievements**

Sl. No.	Crops	State	Approved CFLDs		Achievements of CFLDs	
			Area (ha)	No. of Demos	Area (ha)	No. of Demos
Kharif- 2021-22						
1	Green gram	Maharashtra	180	450	140	350
	Total		180	450	140	350



Sl. No.	Crops	State	Approved CFLDs		Achievements of CFLDs	
			Area (ha)	No. of Demos	Area (ha)	No. of Demos
2	Black gram	Maharashtra	120	300	70	175
		Gujarat	60	150	40	100
	<b>Total</b>		<b>180</b>	<b>450</b>	<b>110</b>	<b>275</b>
3	Pigeon pea	Maharashtra	480	1200	480	1200
		Gujarat	100	250	110	275
	<b>Total</b>		<b>580</b>	<b>1450</b>	<b>590</b>	<b>1475</b>
	<b>Grand Total (Kharif)</b>	<b>940</b>	<b>2350</b>	<b>840</b>	<b>2100</b>	
<b>Rabi- 2020-21</b>						
1	Chickpea	Maharashtra	826	2065	826	2065
		Gujarat	340	850	320	800
	<b>Total</b>		<b>1166</b>	<b>2915</b>	<b>1146</b>	<b>2865</b>
2	Cow pea	Maharashtra	10	25	10	25
3	Horse gram	Maharashtra	40	100	40	100
	<b>Grand Total (Rabi)</b>	<b>1216</b>	<b>3040</b>	<b>1196</b>	<b>2990</b>	
<b>Summer- 2020</b>						
1	Green gram	Maharashtra	20	50	10	25
		Gujarat	220	550	250	625
	<b>Grand Total (Summer)</b>	<b>240</b>	<b>600</b>	<b>260</b>	<b>650</b>	
	<b>Total (Kharif+Rabi+Summer)</b>	<b>2396</b>	<b>5990</b>	<b>2296</b>	<b>5740</b>	

## Technologies Demonstrated

Under CFLD on Pulses, improved and latest varieties along with full package of practices for each pulse crop were adopted and followed. Details are given as under:

## Varieties

The varieties of different pulse crops were demonstrated. Crop-wise and season-wise varieties demonstrated are presented in Table 3.39.

**Table 3.39 Crop-wise varieties demonstrated under NFSM during 2021**

Region	KVKs	Name of the crop Varieties					
		Pigeon pea	Black gram	Green gram	Chick pea	Horse gram	Cow pea
Maharashtra							
Vidharbha	Amaravati-I, Amaravati-II, Bhandara, Buldhana-I, Buldhana-II, Chandrapur, Gadchiroli, Gondia, Nagpur-I, Wardha, Washim, Yavatmal-I, Yavatmal-II	BDN-716, PKV-TARA	AKU-10-01,	BM-2003-02, Utkarsha	RVG-202, JAKI-9218, Phule Vikram,PDK V-Kanchan, Rajvijay -202		
Marathwada	Aurangabad -I, Aurangabad -II, Beed-I, Beed-II, Hingoli, Jalna-I, Jalna-II, Latur, Nanded-I, Nanded-II, Osmanabad, Parbhani,	BDN-711, BDN-716, BDN 2013-41	AKU-10-1	BM 2003-2, Utkarsh	BDNG-797,Phule Vikram,		
Khandesh	Dhule, Jalgaon- I, Jalgaon- II, Nandurbar, Nashik- II	BDN-711	AKU-15, Vishwas	BM2003-2, GM-6,	Phule Vikram, Rajvijay 203, Digvijay		

Region	KVKs	Name of the crop Varieties					
		Pigeon pea	Black gram	Green gram	Chick pea	Horse gram	Cow pea
Western Maharashtra	Ahmednagar-I, Ahmednagar-II, Kolhapur-I, Kolhapur-II, Sangli-I, Satara-I, Solapur-I, Solapur-II, Pune-I,	BDN-711			Phule Vikram, Digvijay		
Konkan	Ratnagiri, Sindhudurg, Raigadh				Dapoli Moong No.-1	Dapoli-1	Kokan sadabahar
<b>Gujarat</b>							
North Gujarat	Mehsana, Patan, Sabarkantha	AGT-2	GU-1	GNM-6			
Central Gujarat	Ahmedabad, Anand, Bharuch, Dahod, Kheda, Narmada, Panchmahal, Vadodara	Gujarat Tuver-104 (GT-104), AGT-2, GJP-1	Guj. Urad 3	Gujarat Mungbean-6 (GM-6), GAM-5	GJG 3, GG-3		
South Gujarat	Dang, Tapi, Valsad, Navsari, Surat			GM-6	GG-5		
Saurashtra	Amreli, Bhavnagar, Jamnagar, Junagadh, Morbi, Porbandar, Rajkot-I, Surendranagar				GJG-6, GJG - 5, GG-5		

## Production Technologies

The general and specific production technologies demonstrated for pulse crops under CFLDs were integrated crop management; integrated nutrient, pest, disease management; seed treatment with bio agents; foliar application of micro nutrient mixtures like pulse wonder; pheromone traps, yellow stick traps; line sowing; utilization of residual moisture after cereals; mechanical harvesting in chickpea etc.

## Results

Cluster FLDs were implemented on major pulse crops viz., green gram, black gram, pigeon pea, chickpea, horse gram and cowpea under NFSM during 2020-21 in an area of 2296 ha by involving 5740 farmers covering from two states namely Maharashtra and Gujarat. Season-wise and crop-wise results are presented here under:

### Performance of CFLDs on *kharif* pulses:

Cluster FLDs on three pulse crops viz., green gram, black gram and pigeon pea were implemented during *kharif* 2021. The demonstrations on green gram were laid out by 13 KVKs and average yield of 7.22 q/ha obtained which was higher (37.22%) over local check (5.71 q/ha). In black gram, 13 KVKs laid out demonstrations and got mean yield of 6.90 q/ha

which was more than local practice (5.35 q/ha). Under pigeon pea, 38 KVKs conducted cluster FLDs and obtained average yield of 14.18 q/ha which showed superiority (28.80%) over check (11.01 q/ha). State-wise and centre wise data is presented in Table 3.40.

### Performance of CFLDs on *Rabi* pulses:

Technology demonstrations on three pulse crops viz., chick pea, horse gram and cowpea were implemented during *rabi* season. Chickpea was demonstrated by 57 KVKs and average yield obtained was 18.27 q/ha which was greater (26.12%) than existing practice, while horse gram was demonstrated by 2 KVK that resulted average yield of 7.5 q/ha which was higher (43.04%) than farmer's practice (5.3 q/ha). Cowpea was demonstrated by one KVK that resulted average yield of 12 q/ha which was more (50 %) than farmer's practice (8 q/ha). State-wise and KVK wise data is presented in Table 3.40.

### Performance of CFLDs on *Summer* pulses:

Green gram demonstrations (650) were conducted on 260 ha area in summer season. Average yield of 8.11 q/ha was attained under demonstrations which was higher by 32.63 % over local check (6.15 q/ha). Net profit of Rs. 38160/ha was gained which was higher by 49.22% over existing practice. State-wise and KVK wise data is presented in Table 3.40.

Table 3.40 State-wise and KVK wise data on pulses in different seasons

State	KVK	Season	Crop	Area (ha)	Demo (No.)	Average Yield (q/ha)		Increase (%)	Net Return (Rs./ha)		Increase (%)
						Demo	Check		Demo	Check	
Maharashtra	9	Kharif	Black gram	70	175	5.55	3.88	46.20	20784	10710	89.79
Gujarat	4	Kharif	Black gram	40	100	8.24	6.82	20.65	18034	12234	93.74
<b>Total</b>	<b>13</b>			<b>110</b>	<b>275</b>	<b>6.90</b>	<b>5.35</b>	<b>28.95</b>	<b>19409</b>	<b>11472</b>	<b>69.18</b>
Maharashtra	13	Kharif	Green gram	140	350	7.22	5.71	37.22	31952	21225	81.95
Maharashtra	30	Kharif	Pigeon pea	480	1200	14.11	11.00	28.11	56738	38480	52.73
Gujarat	8	Kharif	Pigeonpea	110	275	14.25	11.02	31.17	60740	44749	41.36
<b>Total</b>	<b>38</b>			<b>590</b>	<b>1475</b>	<b>14.18</b>	<b>11.01</b>	<b>28.80</b>	<b>58739</b>	<b>41614</b>	<b>41.15</b>
Maharashtra	40	Rabi	Chick pea	826	2065	18.28	14.34	28.75	53463	36311	52.94
Gujarat	17	Rabi	Chickpea	320	800	18.27	14.64	25.68	51676	37072	39.62
<b>Total</b>	<b>57</b>			<b>1146</b>	<b>2865</b>	<b>18.27</b>	<b>14.49</b>	<b>26.12</b>	<b>57761</b>	<b>41895</b>	<b>37.87</b>
Maharashtra	2	Rabi	Horsegram	40	100	7.58	5.3	43.04	29670	10200	95.5
Maharashtra	1	Rabi	Cow pea	10	25	12	8	50	62000	28000	89
Maharashtra	1	Summer	Green gram	10	25	6.4	4.8	33.33	36000	26000	38.46
Gujarat	14	Summer	Green gram	250	625	9.82	7.50	31.93	40321	26253	59.981
<b>Total</b>	<b>15</b>			<b>260</b>	<b>650</b>	<b>8.11</b>	<b>6.15</b>	<b>32.63</b>	<b>38161</b>	<b>26127</b>	<b>49.22</b>

### Training Courses Conducted on Pulses

Different on-campus and off-campus training courses were organized to orient the participating farmers about pulses production and protection technologies. In total, 439 training courses were organized with the

participation of 13513 farmers (10999 male and 2564 female) that consists of 183 on campus with 5355 participants (4256 male and 1149 female) and 256 off-campus with 8158 participants (6743 male and 1415 female). Details are given in Table 3.41.

Table 3.41 Training programs conducted on pulses production technologies

State	No. of KVKs	Area (ha)	Dem (No.)	On campus training				Off campus training				Total No. of Trainings and Farmers			
				C	M	F	T	C	M	F	T	C	M	F	T
Kharif: Black gram															
Maharashtra	7	70	175	7	208	27	235	16	379	36	415	23	587	63	650
Gujarat	3	40	100	3	72	0	72	5	118	5	123	8	190	5	195
Total	10	110	275	10	280	27	307	21	497	41	538	31	777	68	845
Kharif: Green gram															
Maharashtra	13	140	350	12	271	58	329	20	502	68	570	32	773	126	899
Kharif: Pigeon pea															
Maharashtra	30	480	1200	31	852	167	969	46	1277	204	1481	77	2129	371	2450
Gujarat	8	110	275	23	256	140	396	31	1051	304	1355	54	1307	444	1751
Total	38	590	1475	54	1108	307	1365	77	2328	508	2836	131	3436	815	4201
Rabi: Chick pea															
Maharashtra	40	826	2065	51	1314	237	1551	74	1789	390	2179	125	3103	627	3730
Gujarat	17	320	800	27	610	160	770	40	985	190	1175	67	1595	350	1945
Total	57	1146	2865	78	1924	397	2321	114	2774	580	3354	192	4698	977	5675



State	No. of KVKs	Area (ha)	Dem (No.)	On campus training				Off campus training				Total No. of Trainings and Farmers			
				C	M	F	T	C	M	F	T	C	M	F	T
Rabi: Horse gram															
Maharashtra	2	40	100	1	20	10	30	2	40	20	60	3	60	30	90
Rabi: Cow pea															
Maharashtra	2	10	25	1	15	15	30	2	35	36	71	3	50	51	101
Summer: Green gram															
Maharashtra	1	10	25	1	40	0	40	2	65	0	65	3	105	0	105
Gujarat	14	250	625	26	598	335	933	18	502	162	664	44	1100	497	1597
Total	15	260	650	27	638	335	973	20	567	162	729	47	1205	497	1702
Grand Total		2296	5740	183	4256	1149	5355	256	6743	1415	8158	439	10999	2564	13513

### Extension Activities

For making wide exposure and awareness, different extension activities on cluster frontline demonstrations for farmers and extension functionaries were organized by KVKs during season (Table 3.42). A total

of 12243 participants (10848 farmers and 1395 extension officials) attended in different extension activities and got benefitted about pulses demonstrations organized on pigeon pea, chickpea, black gram, green gram, horse gram and cow pea in cluster mode.

**Table 3.42 Extension activities and number of participants**

State	KVK	Area (ha)	Demo (No.)	Extension Activities and Participants								Total			
				Farmers				Extension Personnel							
				Extn Act.	M	F	T	Extn Act.	M	F	T	Extn Act.	M	F	T
Kharif: Black gram															
Maharashtra	7	70	175	15	417	82	499	15	80	36	116	30	497	118	615
Gujarat	3	40	100	19	348	10	358	6	35	6	41	25	383	16	399
Total	10	110	275	34	765	92	857	21	115	42	157	55	880	134	1014
Kharif: Green gram															
Maharashtra	13	140	350	27	642	136	778	20	124	53	177	47	766	189	955
Total	13	140	350	27	642	136	778	20	124	53	177	47	766	189	955
Kharif: Pigeon pea															
Maharashtra	30	480	1200	54	2157	265	2422	33	167	28	195	87	2324	293	2617
Gujarat	8	110	275	21	532	160	692	24	105	64	169	45	637	224	861
Total	38	590	1475	75	2689	425	3114	57	272	92	364	132	2961	517	3478
Rabi: Chick pea															
Maharashtra	40	826	2065	87	3446	409	3825	53	344	56	400	140	3790	465	4225
Gujarat	17	320	800	61	1091	243	1334	25	109	26	135	86	1200	269	1469
Total	57	1146	2865	148	4537	652	5159	78	453	82	535	226	4990	734	5694
Rabi: Horse gram															
Maharashtra	2	40	100	3	52	61	113	3	6	7	13	6	58	68	126
Rabi: cow pea															
Maharashtra	1	10	25	3	48	52	100	3	6	7	13	6	54	59	113

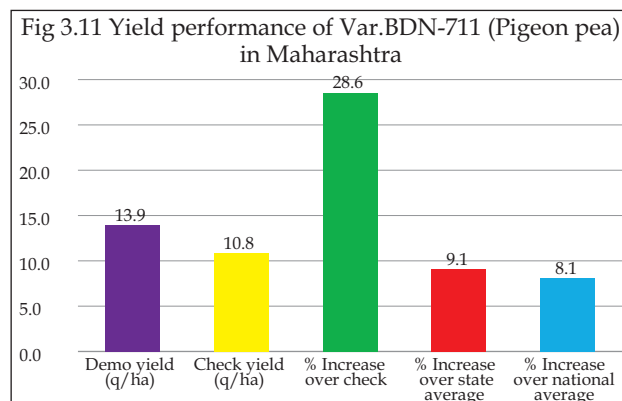
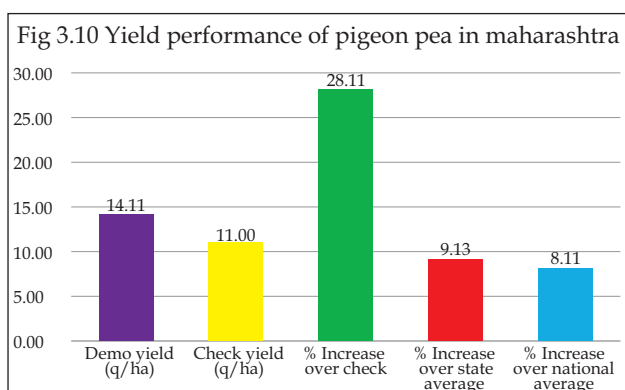
State	KVK	Area (ha)	Demo (No.)	Extension Activities and Participants								Total			
				Farmers				Extension Personnel							
				Extn Act.	M	F	T	Extn Act.	M	F	T	Extn Act.	M	F	T
Summer: Green gram															
Maharashtra	1	10	25	4	82	0	82	2	2	0	2	6	84	0	84
Gujarat	14	250	625	85	406	239	645	42	102	32	134	127	508	271	779
Total	15	260	650	89	488	239	727	44	104	32	136	133	592	271	863
Grand Total		2296	5740	379	9221	1657	10848	226	1080	315	1395	605	10301	1972	12243

### Yield performance of pigeon pea cultivars in Maharashtra

Technology demonstrations on pigeon pea were conducted in cluster mode with adoption of improved cultivars and full package of practices at farmers' fields. Highest yield of 14.11 q/ha was obtained under Variety BDN-711 in Aurangabad, Beed, Jalgaon, Jalna, Nanded, Nandurbar, Osmanabad, Pune and Solapur districts with net profit of Rs. 56738/ha. BDN-716 also performed well in Akola, Amravati, Buldhana, Hingoli, Latur, Nagpur, Nanded, Parbhani, Wardha, Washim & Yavatmal districts where 13.91 q/ha yield was attained with net gain of Rs. 56108/ha (Table 3.43). Overall in Maharashtra, 14.11 q/ha mean yield was



attained under demonstrations which was superior about 28.11% higher over local check (11 q/ha) and also reflected 9.13% higher over at state average and 8.11% at national average yield (Fig. 3.10).

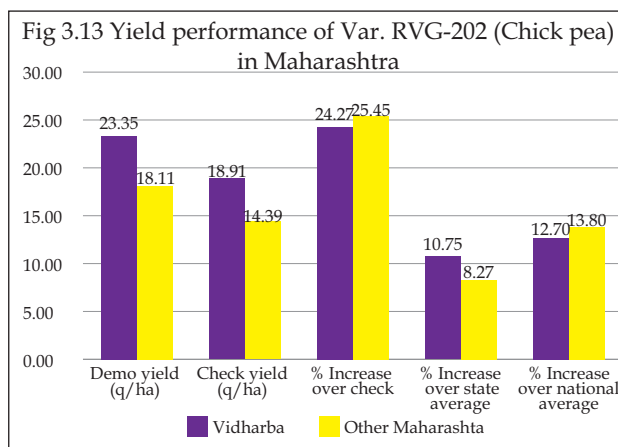
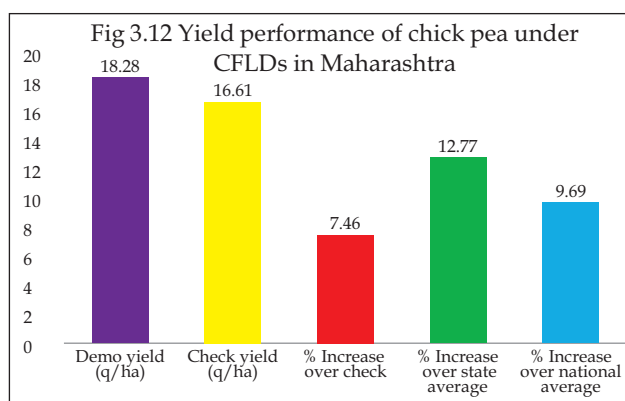


**Table 3.43 Yield performance of pigeonpea cultivars**

Variety	District	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
BDN-711	Ahmednagar-II, Aurangabad -I, Aurangabad -II, Beed-I, Beed-II, Jalgaon-I, Jalna-I, Jalna-II, Nanded-II Nundurbar, Osmanabad, Pune-I, Solapur-I,	140	350	14.11	11.00	28.11	56738	38480	47.45
BDN-716	Akola, Amravati-I, Amravati-II, Buldhana-II, Hingoli, Latur, Nagpur, Nanded-I, Parbhani, Wardha, Washim, Yavatmal-I, Yavatmal-II	240	550	13.91	10.82	28.35	56108	38194	46.90
PKV-TARA	Bhandara, Chandrapur, Gondia, Gadchiroli,	70	175	13.65	10.67	27.68	56642	38532	47.00

## Performance of chickpea cultivars in Maharashtra

On an average 18.28 q/ha yield of chickpea was obtained in Maharashtra by following improved varieties and district specific technologies under cluster frontline demonstrations (Table 3.44). It was shown that mean yield was 9.76% higher over state average and 13.14% higher over national average yield (Fig. 3.12). Region wise and variety wise performance of chickpea cultivar RGV-202 is given in Fig. 3.13.



**Table 3.44 Performance of chickpea cultivars in Maharashtra**

Variety	District	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
BDNG-797 (Akash)	Aurangabad- I, Aurangabad-II, Beed-II, Jalna-I, Latur	50	125	17.87	13.94	28.26	53959	36225	48.95
JAKI-9218	Beed-I, Bhandara, Chandrapur, Gadchiroli, Gondia, Washim	50	205	18.28	14.34	27.48	54412	36656	48.44
Digvijay	Nashik-II, Satara-I, Thane	40	100	18.02	14.86	21.25	16915	36441	47.67
Phule Vikram	Ahmednagar-I, Dhule, Jalgaon-I, Jalgaon-II, Pune-I, Solapur-I, Solapur-II	376	940	18.19	14.27	27.46	54799	37219	47.23
(Rajvijay) RVG-202	Ahmednagar-II, Akola, Amaravati-I, Amaravati-II, Buldhana-I, Hingoli, Kolhapur-I, Nanded-I, Nanded-II,	160	400	18.28	14.34	27.48	54799	37219	47.23
(Rajvijay) RVG-203	Nagpur, Nyndurbar, Wardha,	40	100	17.30	13.53	27.84	54799	37219	47.23
Dapoli-I	Raigadh, Sindhudurg	40	100	7.58	5.3	42.92	29670	10200	190.88

## Yield performance of Chickpea in Gujarat

In Gujarat, cluster demonstrations on GJG-3 & 5 and GG-3 & 5 cultivars were conducted on 200 ha. Mean yield of Var. GG-5 was 15.96 q/ha attained under demonstrations which was 25.49 % higher over

existing practice (12.87 q/ha), 12.77% higher over state and 9.69% over national average yield (Fig. 3.13). Net economic gain of Rs. 61409/ha was realised by the farmers which was 45.46% more than local check (Table 3.45).



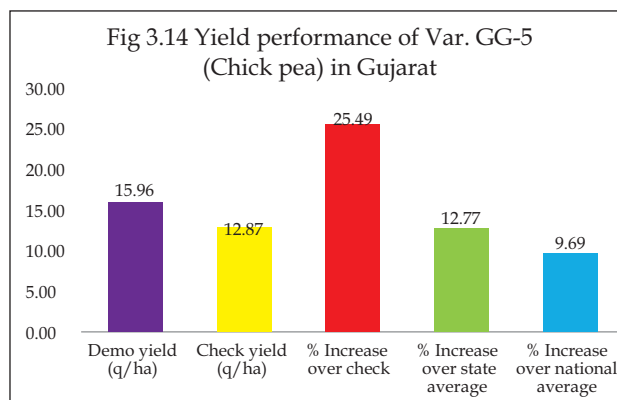


Table 3.45 Yield performance of chickpea in Gujarat

Variety	District	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
GJG-3&5	Dahod, Mehsana, Panchmahal, Bhavnagar, Valsad	60	150	17.10	14.83	15.31	61409	42218	45.46
GG 3&5	Bharuch, Dang, Panchamal, Kheda, Narmada, Navsari, Patan, Rajkot-I, Surat, Tapi, surendranagr	140	350	16.11	12.94	24.50	69598	54134	28.57

### Yield Performance of Pigeon pea Cultivars in Gujarat

Under cluster frontline demonstrations, average yield of 14.42 q/ha was attained which was 24.66% over

local check. GJP-1 cultivar provided 14.50 q/ha which was superior over local check (12.50 q/ha) (Fig. 3.15). BSMR-853 cultivars performed well exhibited 25.48% increase in yield over state average yield (Fig. 3.16).

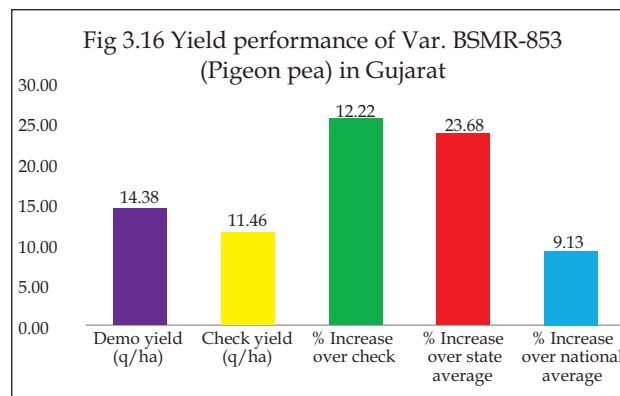
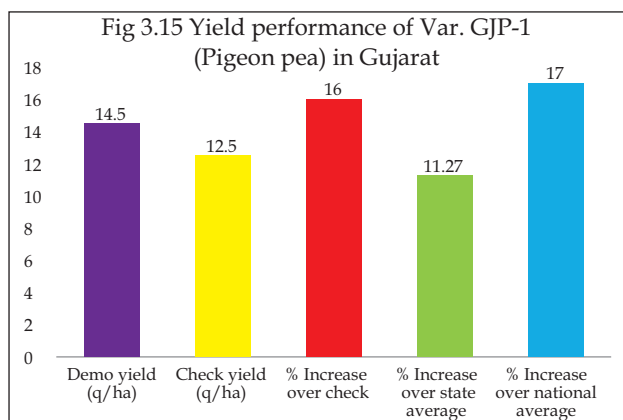


Table 3.46 Yield level and economic performance of pigeon pea cultivars in Gujarat

Variety	District	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
AGT-2	Panchmahal, Sabrkantha, Narmada	40	100	13.93	10.72	30.023	57126	40082	42.52
BSMR-853	Navsari	10	25	14.38	11.46	22.22	81116	65524	51.366
GJP-1	Vadodara	10	25	14.5	12.5	16	50800	39200	29.59
GP-104	Bharuch, Tapi	30	75	14.87	11.92	30.38	65764	49000	37.30

## Cluster Frontline Demonstrations of Oilseeds under NFSM 2021

Cluster Frontline Demonstrations of Oilseeds under NFSM 2021 was sanctioned by Government of India, Ministry of Agriculture & Farmers Welfare with an aim to enhance the production of oilseeds in the

country. As a part of this project, ICAR-ATARI, Pune implemented the project on oilseeds crops *viz.*, groundnut, sesame, soybean, castor, linseed, safflower and rapeseed and mustard in selected districts through respective KVKs in the states of Maharashtra and Gujarat during the year 2021. Details are presented here under:



### Target and Achievements

#### Target

In total, 4950 demonstrations on oilseed crops in cluster mode were targeted covering 1980 ha area in Maharashtra and Gujarat during kharif, rabi and summer seasons. Out of which 1975 demonstrations in area of 790 ha for crops *viz.*, groundnut, sesame, soybean and castor was target during kharif season. A total of 950 demonstrations on 380 ha area for crops rapeseed and mustard, safflower and linseed during rabi season and 2025 CFLDs in an area of 810 ha for crop groundnut and sesame during summer was targeted.

#### Achievements

A total of 4885 cluster frontline demonstrations were implemented in an area of 1954 ha, out of targeted 4950 CFLDs (1980 ha.) in Maharashtra and Gujarat during 2021.

**(i) Kharif Season:** A total of 1936 CFLDs were conducted on four oilseed crops *viz.*, groundnut, sesame, soybean and castor in an area of 782 ha covering two states Maharashtra and Gujarat.

**(a) Groundnut:** Cluster FLDs were organized in an area of 220 ha with 550 participating farmers of which 30 ha with 75 farmers in Maharashtra and 190 ha with 475 farmers in Gujarat.

**(b) Sesame:** Cluster FLDs were organized in an area of 70 ha with 175 participating farmers of which 20 ha with 50 farmers in Maharashtra and 50 ha with 125 farmers in Gujarat.

**(c) Soybean:** Cluster FLDs were laid out on area of 382 ha benefitting 951 farmers of which 312 ha with 776 farmers in Maharashtra and 70 ha with 175 farmers in Gujarat.

**(d) Castor:** Castor demonstrations were carried on 110 ha area with involvement of 260 farmers in Gujarat.

**(ii) Rabi Season:** A total of 775 CFLDs were conducted on three oilseed crops *viz.*, rapeseed and mustard, linseed and safflower in an area of 310 ha covering two states Maharashtra and Gujarat.

**(a) Rapeseed and Mustard:** In total, 275 demonstrations were conducted on rapeseed and mustard covering an area of 110 ha in Gujarat.

**(b) Safflower:** 275 farmers laid out demonstrations on safflower with coverage of 110 ha area in Maharashtra.

**(c) Linseed:** 225 farmers demonstrated linseed technologies on an area of 90 ha in Maharashtra.

**(iii) Summer Season:** A total of 2174 CFLDs were conducted on two oilseed crops *viz.*, groundnut and

sesame in an area of 862 ha covering two states Maharashtra and Gujarat.

**(a) Groundnut:** Cluster FLDs were implemented in an area of 582 ha with the involvement of 1474 farmers of which 440 ha with 1100 farmers in Maharashtra and 142 ha with 374 farmers in Gujarat.

**(b) Sesame:** Cluster FLDs were implemented in an area of 280 ha with the involvement of 700 farmers of which 100 ha with 250 farmers in Maharashtra and 180 ha with 450 farmers in Gujarat.

Crop-wise data for three seasons of 2021 viz., *Kharif*, *Rabi* and *Summer* on approved CFLDs and achievements are presented in Table 3.47.

**Table 3.47 Abstract of approved Cluster FLDs on Oilseeds under NFSM and their achievements**

Sr. No.	Crops	States	Approved CFLDs		Achievements of CFLDs	
			Area (ha)	No. of Demos	Area (ha)	No. of Demos
Kharif-2021						
1	Ground nut	Maharashtra	30	75	30	75
		Gujarat	170	425	190	475
	Total		200	500	220	550
2	Sesame	Maharashtra	20	50	20	50
		Gujarat	50	125	50	125
	Total		70	175	70	175
3	Soybean	Maharashtra	330	825	312	776
		Gujarat	70	175	70	175
	Total		400	1000	382	951
4	Castor	Gujarat	120	300	110	260
	Total		120	300	110	260
Grand Total (Kharif)		790	1975	782	1936	
Rabi-2020-21						
1	Rapeseed and Mustard	Gujarat	110	275	110	275
2	Safflower	Maharashtra	110	275	110	275
3	Linseed	Maharashtra	160	400	90	225
Ground Total ( Rabi)		380	950	310	775	
Summer -2021						
1	Groundnut	Maharashtra	440	1100	440	1100
		Gujarat	130	325	142	374
	Total		570	1425	582	1474
2	Sesame	Maharashtra	70	175	100	250
		Gujarat	170	425	180	450
	Total		240	600	280	700
Grand Total (Summer)		810	2025	862	2174	
Total (Kharif +Rabi+Summer)		1980	4950	1954	4885	

### Technologies Demonstrated

Improved varieties and latest technologies were

included under cluster frontline demonstrations on oilseed crops. Details are given in Table 3.48.



**Table 3.48 Crop-wise and season-wise varieties demonstrated under NFSM during 2020-21**

Crop	Varieties		
	Kharif	Rabi	Summer
Groundnut	TAG-24, JL-776, Konkan Bhuratna, GJG-22, GG-20, GJG - 32, TG-37-A	-	TAG 24, TAG-37 A, GJG -9, Phule Bharati, Phule Chaitanya, TG 51, ICGV-03043, kokan bhuratna, Phule Unap (JL-286), GG-34, GJG-31, GJG-32
Sesame	Kharif AKT-64, JLT-408, Guj. Til-4, GT-5	-	PKV-NT-11, JLT 408, GJT-5, GT 3
Soybean	Phule Sangam (KDS-726), MACS 1188, MAUS-162, MAUS-158, KDS-753, JS - 335, MAUS-612, NRC-37, JS-20-34	-	-
Castor	GCH 10, GCH-8, GCH-9, GCH-7	-	-
Linseed	-	LSL-93, PKV-NL-260,	-
Rapeseed and Mustard	-	GDM-4, NRCHB 101	-
Safflower	-	PKV- PINK, ISF-764, PBNS-12, PBNS-86	-

## Production and Protection Technologies

Specific production and protection technologies of oilseed crops were identified and adopted under demonstrations to show the potential of improved varieties.

- Integrated crop management
- Integrated nutrient, pest, disease management
- Seed treatment with bio agents
- Foliar applications of micro nutrient mixtures.
- Pheromone traps, yellow stick traps
- Line sowing
- Utilization of residual moisture after cereals
- Relay cropping etc.

## Results

Season-wise and crop-wise results of seven oilseed crops *viz.*, groundnut, sesame, soybean, castor, rapeseed and mustard, linseed and safflower under NFSM during 2021 in an area of 1954 ha by involving 4885 farmers covering two states namely Maharashtra and Gujarat are presented here under:

**Performance of Kharif Oilseeds:** Cluster FLDs on 4 oilseed crops *viz.*, groundnut, sesame, soybean and castor were implemented during *kharif* 2021. Demonstrations on groundnut were executed by 19 KVKs and provided mean yield of 19.78 q/ha which

was higher (34.60 %) than farmer's practice (14.70 q/ha). In sesame, 6 KVKs laid out demonstrations and obtained average yield of 4.51 q/ha which showed superiority (24.87 %) over existing practice (3.61 q/ha). In soybean, 34 KVKs demonstrated latest technologies which provided average yield of 19.02 q/ha which was higher over check (15.19 q/ha). In case of castor, 8 KVKs demonstrated the latest technologies, resulted average yield of 28.26 q/ha which was better against local practice (23.58 q/ha). State-wise and KVK wise data is presented in Table 3.49.

**Performance of Rabi Oilseeds:** Technology demonstrations on linseed, safflower, rapeseed and mustard were organized during rabi 2020-21. Linseed technology was demonstrated at 7 KVKs and resulted 5.19 q/ha yield which was more (32.41%) than farmer's practice (3.92 q/ha). In safflower, 7 KVKs demonstrated latest technologies that provided yield of 10.00 q/ha which was greater (29.62%) than existing practice (7.72 q/ha). In rapeseed and mustard, 7 KVKs organized demonstrations in field situations which gave average yield 12.56 q/ha which was superior over check (9.57 q/ha). State-wise and KVK wise data is presented in Table 3.49.

**Performance of Summer Oilseed Crops:** Groundnut and sesame were taken up under cluster demonstrations in summer 2021. A total of 1474

demonstrations were laid out on summer groundnut. On an average of 22.43 q/ha yield was achieved under summer groundnut which was about 17.24 % higher over local practice. Average net gain was of Rs. 64823

/ha was obtained by the farmers. Similarly, under sesame, average yield of 6.58 q/ha was recorded which was almost 23.22% more over local check with net profit of Rs. 33139/ha

**Table 3.49 Performance of oilseed crops**

State	KVK	Season	Crop	Area (ha)	Demo (No.)	Average Yield (q/ha)		Increase (%)	Net Return (Rs./ha)		Increase (%)
						Demo	Check		Demo	Check	
Maharashtra	3	Kharif	Groundnut	30	75	18.38	11.54	59.29	57435	27853	106.21
Gujrat	16	Kharif	Groundnut	190	475	21.19	17.86	18.65	76700	58020	32.20
<b>Total</b>	<b>19</b>			<b>220</b>	<b>550</b>	<b>19.78</b>	<b>14.70</b>	<b>34.60</b>	<b>67067</b>	<b>42936</b>	<b>56.20</b>
Maharashtra	2	Kharif	Sesame	20	50	3.45	2.75	25.45	15200	8675	75.22
Gujrat	4	Kharif	Sesame	50	125	5.57	4.47	24.52	25663	18342	39.91
<b>Total</b>	<b>6</b>			<b>70</b>	<b>175</b>	<b>4.51</b>	<b>3.61</b>	<b>24.93</b>	<b>20431</b>	<b>13509</b>	<b>51.24</b>
Maharashtra	27	Kharif	Soybean	312	776	21.08	16.31	29.29	70024	47343	47.91
Gujrat	7	Kharif	Soybean	70	175	16.95	14.07	20.45	50308	37706	33.42
<b>Total</b>	<b>34</b>			<b>382</b>	<b>951</b>	<b>19.02</b>	<b>15.19</b>	<b>25.20</b>	<b>60166</b>	<b>42525</b>	<b>41.49</b>
Gujrat	8	Kharif	Castor	110	260	28.26	23.58	19.84	139470	110829	25.84
<b>Total</b>	<b>8</b>			<b>110</b>	<b>260</b>	<b>28.26</b>	<b>23.58</b>	<b>19.84</b>	<b>139470</b>	<b>110829</b>	<b>25.84</b>
Maharashtra	7	Rabi	Linseed	90	225	5.19	3.92	32.41	14460	6363	127.25
Maharashtra	7	Rabi	Safflower	110	275	10.00	7.72	29.62	28698	15994	79.43
Gujrat	7	Rabi	Rapeseed and Mustard	110	275	22.49	18.29	22.97	81074	58132	39.47
<b>Total</b>	<b>21</b>			<b>310</b>	<b>775</b>	<b>12.56</b>	<b>9.97</b>	<b>25.98</b>	<b>41410</b>	<b>26830</b>	<b>54.34</b>
Maharashtra	22	Summer	Groundnut	440	1100	23.18	17.51	32.39	62269	37633	65.46
Gujrat	9	Summer	Groundnut	142	374	21.67	16.97	27.69	67376	46514	44.85
	<b>31</b>			<b>582</b>	<b>1474</b>	<b>22.43</b>	<b>17.24</b>	<b>30.10</b>	<b>64823</b>	<b>42074</b>	<b>54.07</b>
Maharashtra	6	Summer	Sesame	100	250	4.46	3.49	27.81	22942	16768	36.82
Gujrat	10	Summer	Sesame	180	450	8.69	7.19	20.99	43337	32590	32.98
<b>Total</b>	<b>16</b>			<b>280</b>	<b>700</b>	<b>6.58</b>	<b>5.34</b>	<b>23.22</b>	<b>33139</b>	<b>24679</b>	<b>34.28</b>

### Training Courses on Oilseed Crops

On and off campus training courses were organized by KVKs on full package of practices for groundnut, sesame, soybean, castor, linseed, safflower and rapeseed and mustard. A total of 477 training courses

were structured with the participation of 12093 farmers (10125 male and 1968 female) that consists of 147 on-campus with 4539 participants (3760 male and 779 female) and 330 off-campus with 7554 participants (6365 male and 1189 female). Details are given in Table 3.50.

**Table 3.50 Training courses organised on oilseed crops**

State	No. of KVKs	Area (ha)	Dem (No.)	On campus training				Off campus training				Total No. of Trainings and Farmers			
				C	M	F	T	C	M	F	T	C	M	F	T
Kharif: Groundnut															
Maharashtra	3	30	75	6	130	71	201	10	306	77	383	16	436	148	584

State	No. of KVKs	Area (ha)	Dem (No.)	On campus training				Off campus training				Total No. of Trainings and Farmers			
				C	M	F	T	C	M	F	T	C	M	F	T
Gujrat	16	190	475	16	330	105	435	28	689	49	738	44	1019	154	1173
<b>Total</b>	<b>19</b>	<b>220</b>	<b>550</b>	<b>22</b>	<b>460</b>	<b>176</b>	<b>636</b>	<b>38</b>	<b>995</b>	<b>126</b>	<b>1121</b>	<b>60</b>	<b>1455</b>	<b>302</b>	<b>1757</b>
<b>Kharif: Sesame</b>															
Maharashtra	2	20	50	3	69	21	90	6	229	79	308	9	298	100	398
Gujrat	4	50	125	4	62	55	117	8	269	0	269	12	331	55	386
<b>Total</b>	<b>6</b>	<b>70</b>	<b>175</b>	<b>7</b>	<b>131</b>	<b>76</b>	<b>207</b>	<b>14</b>	<b>498</b>	<b>79</b>	<b>577</b>	<b>21</b>	<b>629</b>	<b>155</b>	<b>784</b>
<b>Kharif: Soybean</b>															
Maharashtra	27	312	776	33	1056	53	1109	41	1253	115	1368	74	2309	168	2477
Gujrat	7	70	175	6	137	55	192	28	271	166	437	34	408	221	629
<b>Total</b>	<b>34</b>	<b>382</b>	<b>951</b>	<b>39</b>	<b>1193</b>	<b>108</b>	<b>1301</b>	<b>69</b>	<b>1524</b>	<b>281</b>	<b>1805</b>	<b>108</b>	<b>2717</b>	<b>389</b>	<b>3106</b>
<b>Kharif: Castor</b>															
Gujrat	8	110	260	12	290	32	322	12	350	56	406	24	640	88	728
<b>Total</b>	<b>8</b>	<b>110</b>	<b>260</b>	<b>12</b>	<b>290</b>	<b>32</b>	<b>322</b>	<b>12</b>	<b>350</b>	<b>56</b>	<b>406</b>	<b>24</b>	<b>640</b>	<b>88</b>	<b>728</b>
<b>Rabi: Linseed</b>															
Maharashtra	7	90	225	9	298	69	367	8	308	63	371	17	606	132	738
<b>Total</b>	<b>7</b>	<b>90</b>	<b>225</b>	<b>9</b>	<b>298</b>	<b>69</b>	<b>367</b>	<b>8</b>	<b>308</b>	<b>63</b>	<b>371</b>	<b>17</b>	<b>606</b>	<b>132</b>	<b>738</b>
<b>Rabi: Safflower</b>															
Maharashtra	7	110	275	6	146	39	185	7	193	47	240	13	339	86	425
<b>Total</b>	<b>7</b>	<b>110</b>	<b>275</b>	<b>6</b>	<b>146</b>	<b>39</b>	<b>185</b>	<b>7</b>	<b>193</b>	<b>47</b>	<b>240</b>	<b>13</b>	<b>339</b>	<b>86</b>	<b>425</b>
<b>Rabi: Mustard</b>															
Gujrat	7	110	275	7	178	3	181	15	296	10	306	22	474	13	487
<b>Total</b>	<b>7</b>	<b>110</b>	<b>275</b>	<b>7</b>	<b>178</b>	<b>3</b>	<b>181</b>	<b>15</b>	<b>296</b>	<b>10</b>	<b>306</b>	<b>22</b>	<b>474</b>	<b>13</b>	<b>487</b>
<b>Summer: Groundnut</b>															
Maharashtra	22	440	1100	18	471	80	551	46	1302	221	1523	64	1773	301	2074
Gujrat	9	142	374	12	186	121	307	100	292	142	434	112	478	263	741
<b>Total</b>	<b>31</b>	<b>582</b>	<b>1474</b>	<b>30</b>	<b>657</b>	<b>201</b>	<b>858</b>	<b>146</b>	<b>1594</b>	<b>363</b>	<b>1957</b>	<b>176</b>	<b>2251</b>	<b>564</b>	<b>2815</b>
<b>Summer: Season</b>															
Maharashtra	6	100	250	6	166	36	202	10	271	55	326	16	437	91	528
Gujrat	10	180	450	9	241	39	280	11	336	109	445	20	577	148	725
<b>Total</b>	<b>16</b>	<b>280</b>	<b>700</b>	<b>15</b>	<b>407</b>	<b>75</b>	<b>482</b>	<b>21</b>	<b>607</b>	<b>164</b>	<b>771</b>	<b>36</b>	<b>1014</b>	<b>239</b>	<b>1253</b>
<b>Grand total</b>				<b>147</b>	<b>3760</b>	<b>779</b>	<b>4539</b>	<b>330</b>	<b>6365</b>	<b>1189</b>	<b>7554</b>	<b>477</b>	<b>10125</b>	<b>1968</b>	<b>12093</b>

## Extension Activities Organized

Different extension activities were organized by KVKs for creating more awareness and exposure among participating farmers and extension workers especially on oilseed crops. A total of 9674 personnel

(8275 farmers and 1399 extension personnel) participated in different extension activities organized by KVKs on groundnut, sesame, soybean, castor, linseed, safflower and rapeseed and mustard. Details are given in Table 3.51.



Table 3.51 Extension activities conducted on oilseed crops

State	KVK	Area (ha)	Demo (No.)	Extension Activities and Participants								Total			
				Farmers				Extension Personnel							
				Extn Act.	M	F	T	Extn Act.	M	F	T	Extn Act.	M	F	T
Kharif: Groundnut															
Maharashtra	3	30	75	18	348	213	561	14	140	102	242	32	488	315	803
Gujrat	16	190	475	0	0	0	0	0	0	0	0	0	0	0	0
Total	19	220	550	18	348	213	561	14	140	102	242	32	488	315	803
Kharif: Sesame															
Maharashtra	2	20	50	5	115	25	140	6	10	1	11	11	125	26	151
Gujrat	4	50	125	8	129	0	129	9	10	2	12	17	139	2	141
Total	6	70	175	13	244	25	269	15	20	3	23	28	264	28	292
Kharif: Soybean															
Maharashtra	27	312	776	75	1755	182	1937	44	227	44	271	119	1982	226	2208
Gujrat	7	70	175	17	306	176	482	4	104	50	154	21	410	226	636
Total	34	382	951	92	2061	358	2419	48	331	94	425	140	2392	452	2844
Kharif: Castor															
Gujrat	8	110	260	23	485	234	719	21	260	3	263	44	745	237	982
Total	8	110	260	23	485	234	719	21	260	3	263	44	745	237	982
Rabi: Linseed															
Maharashtra	7	90	225	13	418	77	495	8	20	4	24	21	438	81	519
Total	7	90	225	13	418	77	495	8	20	4	24	21	438	81	519
Rabi: Safflower															
Maharashtra	7	110	275	8	130	98	228	10	15	5	20	18	145	103	248
Total	7	110	275	8	130	98	228	10	15	5	20	18	145	103	248
Rabi: Mustard															
Gujrat	7	110	275	34	695	93	788	2	35	0	35	36	730	93	823
Total	7	110	275	34	695	93	788	2	35	0	35	36	730	93	823
Summer: Groundnut															
Maharashtra	22	440	1100	56	1442	175	1617	45	210	55	265	101	1652	230	1882
Gujrat	9	142	374	33	337	317	654	15	64	5	69	48	401	322	723
Total	31	582	1474	89	1779	492	2271	60	274	60	334	149	2053	552	2605
Summer: Sesame															
Maharashtra	6	100	250	8	185	31	216	7	14	2	16	15	199	33	232
Gujrat	10	180	450	13	248	61	309	6	14	3	17	19	262	64	326
Total	16	280	700	21	433	92	525	13	28	5	33	34	461	97	558
Grand total	135	1954	4885	311	6593	1682	8275	191	1123	276	1399	502	7716	1958	9674

## Yield Performance of Soybean Cultivars in Maharashtra

Soybean is one of major oilseed crop in Maharashtra. Different varieties of soybean with improved package of practices were demonstrated in clusters. On an average, yield of 21.08 q/ha was obtained which was 29.29% higher over local check (Table 3.52 and Fig. 3.17). KDS-726 cultivar provided 27.09 q/ha which was higher in Marathwada region (Fig. 3.18).

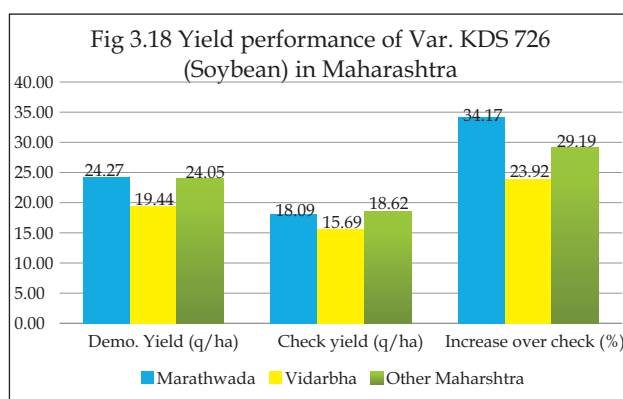
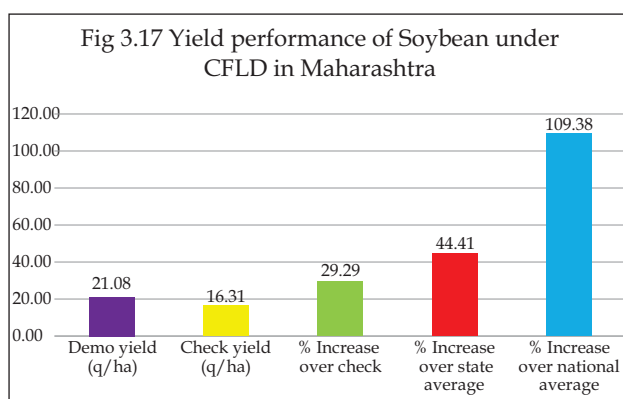


Table 3.52 Yield obtained under soybean demonstrations in Maharashtra

Variety	District	Area (ha)	No. of Demos	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
Phule Sangam (KDS-726)	Akola, Buldhana-II, Dhule, Hingoli, Jalgaon-I, Kolhapur-II, Nanded - II, Nashik II, Pune I, Pune-II, Washim, Sangli-I, Satara-I	158	391	23.11	17.88	29.25	71297	46994	51.72
MACS 1188	Ahmednagar I, Nandurbar, Nashik I, Yavatmal-II	40	100	19.48	15.65	24.47	66805	48041	39.06
MAUS-162	Aurangabad-II, Jalna-I, Nanded-I, Solapur-I	44	110	18.52	12.41	49.23	63113	34866	81.01
MAUS-158	Latur, Nagpur I	30	75	20.45	17.175	19.07	87275	69225	26.07
KDS-753	Kolhapur-I	10	25	27.09	23.11	17.22	113615	91946	23.57
JS - 335	Gadchiroli	10	25	9.93	6.58	50.91	51400	32456	58.37
MAUS-612	Wardha	10	25	15.84	13.76	15.12	33261	25873	28.55

## Groundnut Yield under CFLDs in Gujarat

Under cluster frontline demonstrations of groundnut, GJG 22 cultivar performed well and provided 20.85 q/ha which was about 16.30 % higher over farmer's practice. Net income of Rs. 71903/ha was realised by participating farmers which was 27.58 % more over check (Table 3.53). Overall 21.19 q/ha demo yield was attained in Kharif groundnut which was 10.86 % higher than state average and 26.40 % higher than national average (Fig. 3.19).



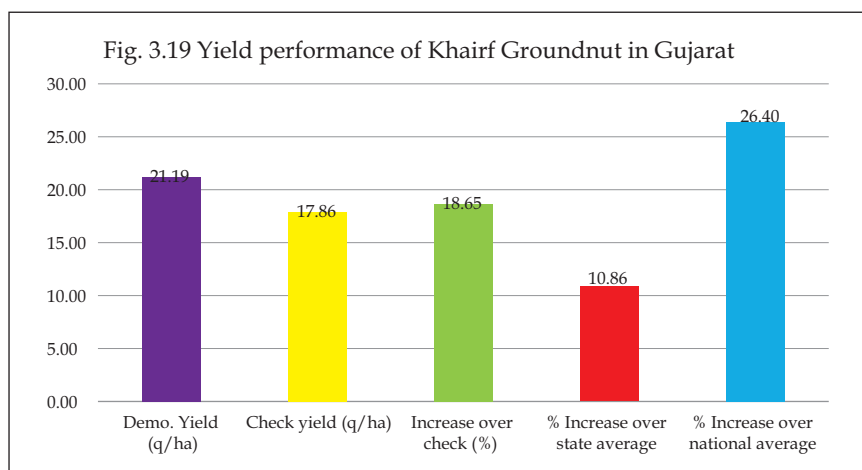


Table 3.53 Yield obtained under groundnut demonstrations

Variety	District	Area (ha)	No. of Demos	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
GG-20	Junagadh, Tapi	20	50	18.27	14.54	25.65	66258	43131	53.62
GJG - 32	Rajkot - II	10	25	30.15	23.25	29.68	109128	71800	51.99
GJG 22	Bhavnagar, Gandhinagar, Kheda, Kutch-I, Mehsana, Sabarkantha, Rajkot-I, Amreli, Kachchh-II, Surendranagar, Jamnagar	140	350	20.85	17.93	16.30	71903	56359	27.58
TG37A	Banaskantha-I, Banaskantha-II,	20	50	21.43	18.05	18.73	97307	75153	29.48

### Performance of Castor in Gujarat

Castor technologies were demonstrated in cluster mode in Ahmedabad, Anand, Patan, Banaskantha I, Banaskantha II, Mehsana, Gandhinagar and Panchmahal at farmers' fields. Yield of 28.26 q/ha

was attained which was about 19.84 % higher over check (Fig. 3.20). GCH-8 cultivar performed well and provided 30.49 q/ha which was 17.12 % higher over farmer's practice. Net income of Rs.156827/ha was realised by participating farmers which was 25.22 % more over check (Table 3.54).

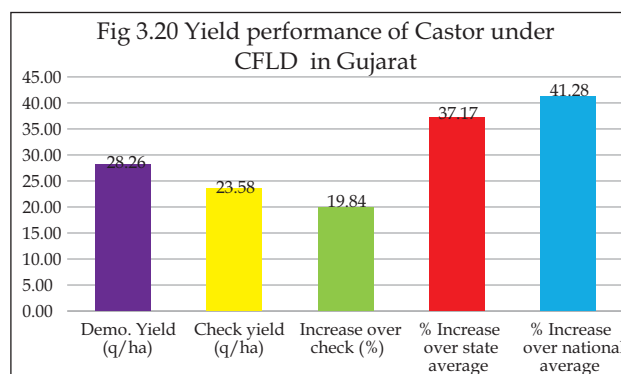


Table 3.54 Yield performance under castor demonstrations

Variety	District/ KVK	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
GCH 10	Ahmedabad, Anand	20	50	23.6	19.75	19.49	125725	101350	24.05



Variety	District/ KVK	No. of Demos	Area (ha)	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
GCH-7	Patan	10	25	29	23.6	22.88	162058	128919	25.71
GCH-8	Banaskantha-I, Banaskantha-II, Mehsana, Gandhinagar	60	135	30.49	26.03	17.12	156827	125237	25.22
GCH-9	Panchmahal	20	50	27.9	21.4	30.37	74945	54070	38.61

### Performance of Soybean in Gujarat

In Vadodara, Bharuch, Narmada, Sabarkanta, Surat, Dahod and Tapi districts, soybean cultivar JS-20-34, MACS-1188 and NRC-37 were demonstrated at 175 farmer's fields. Average yield of 16.95 q/ha under

demonstrations plots was obtained which was about 20.45% higher over local practice (Fig 3.21). MACS-1188 cultivar recorded 18.49 q/ha average yield which was about 14.63% higher over local check (Table 3.55)

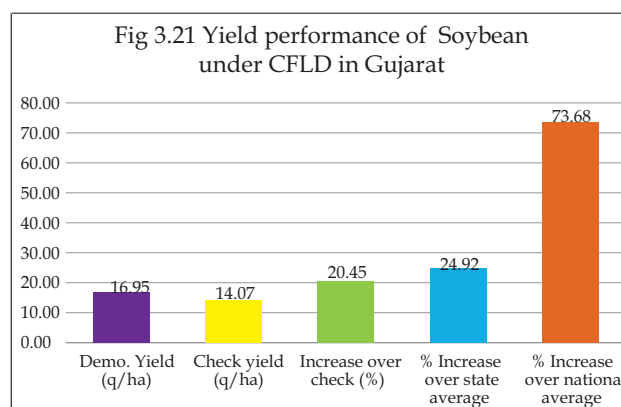


Table 3.55 Yield level and economics under soybean demonstrations

Variety	District	Area (ha)	No. of Demos	Yield (q/ha)		% Increase	Net returns (Rs/ha)		% Increase
				Demo	Check		Demo	Check	
JS-20-34	Vadodara	10	25	16.6	15	10.67	64820	53200	21.84
MACS-1188	Bharuch	10	25	18.49	16.13	14.63	70523	60096	17.35
NRC-37	Narmada, Sabarkanta, Surat, Dahod, Tapi	50	125	16.714	13.476	24.03	43363	30129	43.92

# Training of Farmers and Extension Personnel

## Chapter 4

Training has been considered a key component for updating the knowledge and imparting the new skill to the participants. There was great emphasis on organizing training both for the farmers as well as for the trainers. In the Zone, 82 KVKs organized 6670 training courses with the participation of 310817 farmers, farm women, rural youth, extension functionaries, regular, sponsored and vocational trainings involving Maharashtra, Gujarat and Goa states. Out of these, 81573 participants represented SC/ST category with 47109 male and 34464 female. The farmers and farm women were represented in a proportion of 69.2 % and 30.7%, respectively. In all 255670 farmers and farm women and 32936 rural youth were trained on different skills in different enterprises. Similarly, 22211 extension workers were



also trained in different areas. In addition, 950 sponsored courses were organized for benefiting 38583 trainee. In all, 286 vocational trainings were conducted by the KVKs with 8441 rural youth for developing their entrepreneurial capability and skills (Table 4.1 and Table 4.2).

**Table 4.1 Physical achievement of training programmes**

Clientele	Maharashtra				Gujarat				Goa				Grand Total			
	C	M	F	Total	C	M	F	Total	C	M	F	Total	C	M	F	Total
Farmers & Farm Women	2828	126708	44565	171273	2379	49010	32567	81577	103	1262	1558	2820	5310	176980	78690	255670
Rural Youth	698	18606	8156	26762	130	3231	1841	5072	43	687	415	1102	871	22524	10412	32936
Extension Functionaries	366	13021	5071	18092	113	2900	977	3877	10	155	87	242	489	16076	6135	22211
<b>Total</b>	<b>3892</b>	<b>158335</b>	<b>57792</b>	<b>216127</b>	<b>2622</b>	<b>55141</b>	<b>35385</b>	<b>90526</b>	<b>156</b>	<b>2104</b>	<b>2060</b>	<b>4164</b>	<b>6670</b>	<b>215580</b>	<b>95237</b>	<b>310817</b>

C: Courses, M: Male, F: Female

**Table 4.2 Physical achievement of training programmes**

Category of Training	Maharashtra				Gujarat				Goa				Grand Total			
	C	M	F	Total	C	M	F	Total	C	M	F	Total	C	M	F	Total
Regular	3151	139289	51217	190506	2154	43374	26448	69822	129	1725	1740	3465	5434	184388	79405	263793
Sponsored	529	14699	4884	19583	394	10682	7619	18301	27	379	320	699	950	25760	12823	38583
Vocational	212	4347	1691	6038	74	1085	1318	2403	0	0	0	0	286	5432	3009	8441
<b>Total</b>	<b>3892</b>	<b>158335</b>	<b>57792</b>	<b>216127</b>	<b>2622</b>	<b>55141</b>	<b>35385</b>	<b>90526</b>	<b>156</b>	<b>2104</b>	<b>2060</b>	<b>4164</b>	<b>6670</b>	<b>215580</b>	<b>95237</b>	<b>310817</b>

## Farmers and Farm Women

In all 5310 training courses were conducted by the KVKs in the Zone with 255670 participants including

176980 male and 78690 female. About 31% participants represented female category. The state wise data related to capacity building of farmers and farm women are given below:

### Maharashtra

In Maharashtra, 171273 farmers and farm women were trained through 2828 training courses. More than 26% female represented the trainees group. In total 36482 farmers and farm women belonged to SC/ST category represented 21.3% of the total participants. Majority of courses were conducted on different components such as crop production (456)

with 25814 participants, plant protection (422) with 30162 participants, livestock production and management (368) benefiting 20041 participants, soil health and fertility management (276) with 15024, vegetable crop (197) with 9372 farm women etc. Area-wise and category-wise details of training programmes are furnished in Table 4.3.



**Table 4.3 Training courses for farmers and farm women in Maharashtra**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agricultural Engineering	120	6217	1127	7344	1944	707	2651	8161	1834	9995
Agricultural Extension	95	4212	958	5170	571	163	734	4783	1121	5904
Agro-forestry	2	29	14	43	8	23	31	37	37	74
Capacity Building and Group Dynamics	51	1133	761	1894	277	546	823	1410	1307	2717
Livestock Production and Management	368	12126	3480	15606	3193	1242	4435	15319	4722	20041
Crop Production	456	18441	2573	21014	3768	1032	4800	22209	3605	25814
Feed & fodder technology	2	55	12	67	7	0	7	62	12	74
Entrepreneurship Development	97	3745	2236	5981	440	441	881	4185	2677	6862
Fisheries	10	222	28	250	20	5	25	242	33	275
Fruit technology	140	7752	493	8245	1159	248	1407	8911	741	9652



Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Integrated Farming Systems	20	613	40	653	35	0	35	648	40	688
Medicinal and Aromatic Plants	8	169	66	235	36	8	44	205	74	279
Mushroom technology	2	0	34	34	4	17	21	4	51	55
Natural Resource Management	43	1553	232	1785	287	80	367	1840	312	2152
Nutrition security	145	2132	4788	6920	601	2162	2763	2733	6950	9683
Ornamental Plants	14	387	44	431	71	25	96	458	69	527
Plant protection	422	20412	3497	23909	4963	1290	6253	25375	4787	30162
Plantation crop	12	323	137	460	53	22	75	376	159	535
Problematic soil	5	238	56	294	145	37	182	383	93	476
Processing and value addition	127	2541	2904	5445	367	965	1332	2908	3869	6777
Production of inputs at site	40	1366	504	1870	420	135	555	1786	639	2425
Soil Health and Fertility Management	276	10285	1996	12281	2083	660	2743	12368	2656	15024
Spices	40	3132	129	3261	309	81	390	3441	210	3651
Tuber crops	2	17	0	17	27	0	27	44	0	44
Vegetable Crops	197	5916	999	6915	1824	633	2457	7740	1632	9372
Women empowerment	134	541	4126	4667	539	2809	3348	1080	6935	8015
<b>Total</b>	<b>2828</b>	<b>103557</b>	<b>31234</b>	<b>134791</b>	<b>23151</b>	<b>13331</b>	<b>36482</b>	<b>126708</b>	<b>44565</b>	<b>171273</b>

## Gujarat

Capacity building of 81577 farmers and farm women was done by the KVKs by organizing 2379 training courses in Gujarat. More than 39.92% of the participants were from female group. In all, 31291 participants belonged to SC/ST category representing 38.35% of total trainees. The major thrust was given on crop production technologies (567 courses with 19876 trainees), plant protection (393 courses with 12914 participants) and livestock

management (318 courses with 9312 beneficiaries) and women empowerment (216 courses and 7339 participants). Similarly, soil health and fertility management, agriculture engineering and capacity building with group dynamics were covered under different farmers' empowerment programmes. The details of training courses with male/ female participants are reported in Table 4.4.



**Table 4.4 Training courses for farmers and farm women in Gujarat**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agricultural Extension	150	3104	1188	4292	844	749	1593	3948	1937	5885
Agricultural Engineering	84	1430	449	1879	356	398	754	1786	847	2633
Agro-forestry	5	67	22	89	53	21	74	120	43	163
Group Dynamics and Farmers Organization	6	131	44	175	6	29	35	137	73	210
Livestock Production and Management	318	2731	2355	5086	1901	2325	4226	4632	4680	9312
Crop Production	567	8519	1916	10435	5865	3576	9441	14384	5492	19876
Feed & Fodder Technology	4	79	13	92	7	0	7	86	13	99
Plant Protection	393	7123	1339	8462	2931	1521	4452	10054	2860	12914
Entrepreneurship Development	23	212	180	392	189	88	277	401	268	669
Fisheries	21	319	103	422	81	50	131	400	153	553
Fruit Technology	108	2231	458	2689	515	309	824	2746	767	3513
Medicinal and Aromatic Plants	3	60	0	60	15	25	40	75	25	100
Natural Farming	1	175	333	508	6	19	25	181	352	533
Natural Resource Management	21	80	7	87	348	107	455	428	114	542
Nursery Raising	3	17	28	45	32	7	39	49	35	84
Nutrition Security	51	274	811	1085	123	782	905	397	1593	1990
Ornamental Plants	3	29	33	62	4	0	4	33	33	66
Plantation Crops	7	99	43	142	35	216	251	134	259	393
Problematic Soil Management	7	99	47	146	12	7	19	111	54	165

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Processing and Value Addition	46	267	1496	1763	131	455	586	398	1951	2349
Production of inputs at site	16	314	159	473	130	64	194	444	223	667
Soil Health and Fertility Management	83	1766	315	2081	382	138	520	2148	453	2601
Spices	29	776	168	944	104	93	197	880	261	1141
Tuber Crops	5	77	9	86	15	28	43	92	37	129
Vegetable Crops	209	3161	1303	4464	1785	1402	3187	4946	2705	7651
Women Empowerment	216	0	4327	4327	0	3012	3012	0	7339	7339
<b>Total</b>	<b>2379</b>	<b>33140</b>	<b>17146</b>	<b>50286</b>	<b>15870</b>	<b>15421</b>	<b>31291</b>	<b>49010</b>	<b>32567</b>	<b>81577</b>

## Goa

In Goa, KVK North Goa and South Goa organized 103 training courses with participation of 2820 farmers and farm women. In total participants, SC/ST category farmers/farm women represented about 19.29%. More than 55% of the participants were females. Major attention was given on crop

production (17 courses with 430 trainees), in addition, women empowerment, plant protection, soil health and fertility management and plantation crop components were also emphasized. The details of trainings with participants are given in Table 4.5.



**Table 4.5 Training courses for farmers and farm women in Goa**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Crop Production	17	235	123	358	78	34	112	313	157	430
Capacity Building and Group Dynamics	3	7	11	18	0	20	20	7	31	38



Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Entrepreneurship Development	1	0	25	25	0	0	0	0	25	25
Fisheries	3	12	55	67	6	0	6	18	55	73
Fruits	8	112	89	201	56	23	79	168	112	280
Livestock Production and Management	3	50	11	61	0	0	0	50	11	61
Nutrition Security	5	23	90	113	5	24	29	28	114	142
Plant Protection	11	115	92	207	43	18	61	158	110	268
Plantation Crops	9	63	74	137	23	17	40	86	91	177
Value Addition	7	26	107	133	12	60	72	38	167	205
Soil Health and Fertility Management	10	230	101	331	32	14	46	262	115	377
Tuber Crops	2	32	16	48	11	0	11	43	16	59
Vegetable Crops	4	21	40	61	6	9	15	27	49	76
Medicinal and Aromatic Plant	1	15	49	64	4	10	14	19	59	78
Production of input at site	4	45	61	106	0	0	0	45	61	106
Women Empowerment	15	0	346	346	0	39	39	0	385	385
<b>Total</b>	<b>103</b>	<b>986</b>	<b>1290</b>	<b>2276</b>	<b>276</b>	<b>268</b>	<b>544</b>	<b>1262</b>	<b>1558</b>	<b>2820</b>

## Training of Rural Youth

Major focus was given on skill development for beginning their enterprises/agri-business to become self-depend. In total including Maharashtra, Gujarat and Goa, 871 training courses were organized where 32936 rural youth got benefited on different areas of enterprises based on agriculture, horticulture, bio-

fertilizer/ bio-pesticides and value addition etc. In total participants, 25.2% represented SC/ST categories of rural youths out of which 40.1% belonged to female group. In Maharashtra, 698 training courses were organized with involvement of 26762 rural youth with ratio of male-female participation of 2.3:1.



In capacity building of SC/ST category, 20.2% rural youth were trained. About 35.82% of rural youth were female participants. Main focus was given on livestock management, entrepreneurship development, crop production, plant protection and value addition towards developing skill among rural youth. In case of Gujarat, 130 training courses were arranged with participation of 5072 rural youth. In total participants, 36.2% female trainees attended the programmes and showed keen interest on agribusiness/enterprises. About 27.5% SC/ST

category people were represented in the course. In Goa, 43 training programmes were organized with 1102 participants involving 687 male and 415 female. Major training areas considered for capacity building of rural youth were fisheries, agro forestry, entrepreneurship development, plant protection techniques and nutrition security. About 24.2% participants were represented SC/ST category of rural youth. Details of state wise rural youth training courses are given in Table 4.6 to 4.8.

**Table 4.6 Training courses for rural youth in Maharashtra**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agricultural Engineering	21	290	92	382	179	25	204	469	117	586
Agricultural Extension	39	1561	937	2498	439	480	919	2000	1417	3417
Capacity Building and Group Dynamics	31	842	320	1162	179	126	305	1021	446	1467
Crop Production	54	1271	201	1472	422	109	531	1693	310	2003
Entrepreneurship Development	119	2305	924	3229	826	294	1120	3131	1218	4349
Fisheries	4	79	16	95	10	2	12	89	18	107
Fruits	41	737	148	885	205	89	294	942	237	1179
Livestock Production and Management	153	2561	719	3280	835	533	1368	3396	1252	4648
Medicinal and Aromatic Plants	2	34	3	37	1	0	1	35	3	38
Mushroom Production	2	26	9	35	5	10	15	31	19	50
Natural Resource Management	7	145	34	179	149	16	165	294	50	344
Nursery Management	4	21	44	65	7	19	26	28	63	91
Nutrition Security	8	149	88	237	30	101	131	179	189	368
Ornamental Plants	2	40	9	49	9	1	10	49	10	59
Plant Protection	58	1675	540	2215	376	131	507	2051	671	2722
Plantation Crops	4	56	41	97	22	13	35	78	54	132
Processing and Value addition	66	825	1213	2038	133	259	392	958	1472	2430
Production of Inputs at site	27	417	177	594	114	51	165	531	228	759

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Soil Health and Fertility Management	28	713	141	854	80	25	105	793	166	959
Spices	1	74	0	74	0	0	0	74	0	74
Vegetable Crops	20	455	82	537	233	61	294	688	143	831
Women Empowerment	7	56	32	88	20	41	61	76	73	149
<b>Total</b>	<b>698</b>	<b>14332</b>	<b>5770</b>	<b>20102</b>	<b>4274</b>	<b>2386</b>	<b>6660</b>	<b>18606</b>	<b>8156</b>	<b>26762</b>

**Table 4.7 Training courses for rural youth in Gujarat**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agricultural Engineering	10	184	164	348	31	17	48	215	181	396
Agricultural Extension	2	18	6	24	10	9	19	28	15	43
Capacity Building and Group Dynamics	4	58	36	94	40	9	49	98	45	143
Crop Production	16	257	178	435	40	68	108	297	246	543
Cultivation of Fruit	8	59	45	104	10	15	25	69	60	129
Entrepreneurial development of farmers/ youths	14	201	97	298	4	2	6	205	99	304
Livestock Production and Management	11	185	45	230	24	68	92	209	113	322
Nutrition Security	4	0	0	0	73	64	137	73	64	137
Plant Protection	38	1705	170	1875	221	391	612	1926	561	2487
Processing and Value addition	3	0	98	98	0	6	6	0	104	104
Production of Inputs at site	2	0	0	0	25	23	48	25	23	48
Soil Health and Fertility Management	1	0	0	0	31	5	36	31	5	36
Vegetable Crops	5	22	5	27	33	15	48	55	20	75
Women Empowerment	12	0	144	144	0	161	161	0	305	305
<b>Total</b>	<b>130</b>	<b>2689</b>	<b>988</b>	<b>3677</b>	<b>542</b>	<b>853</b>	<b>1395</b>	<b>3231</b>	<b>1841</b>	<b>5072</b>



**Table 4.8 Training courses for rural youth in Goa**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agro-forestry	6	72	37	109	22	14	36	94	51	145
Capacity Building and Group Dynamics	2	11	27	38	6	6	12	17	33	50
Entrepreneurship Development	6	88	31	119	36	19	55	124	50	174
Fisheries	15	191	92	283	48	21	69	239	113	352
Nutritional security	4	24	46	70	8	34	42	32	80	112
Ornamental Plants	2	31	12	43	13	0	13	44	12	56
Plant Protection	5	62	22	84	31	9	40	93	31	124
Processing and Value Addition	1	0	14	14	0	0	0	0	14	14
Production of Inputs at site	2	44	31	75	0	0	0	44	31	75
<b>Total</b>	<b>43</b>	<b>523</b>	<b>312</b>	<b>835</b>	<b>164</b>	<b>103</b>	<b>267</b>	<b>687</b>	<b>415</b>	<b>1102</b>

### Training of Extension Personnel

In total 489 training courses were organized for developing capacity of 22211 extension functionaries in the Zone. About 22.2% of extension workers were

represented the SC/ST category. The participation of female extension workers was 42.6%. The state-wise information is furnished in Table 4.9 to 4.11.

## Maharashtra



In Maharashtra, 366 training programmes were organized with participation of 18092 extension functionaries on crop production (65 courses), plant protection (74 courses), livestock production and management (19 courses), women empowerment (11



courses) etc. Major focus was given on areas of training specially protected cultivation, micro irrigation, value addition, soil health, organic farming and women empowerment etc. Details of trainings, participants representing male female and SC/ST category officials are provided in Table 4.9.

**Table 4.9 Training courses for extension personnel in Maharashtra**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agricultural Engineering	15	371	83	454	102	9	111	473	92	565
Agricultural Extension	37	929	177	1106	132	40	172	1061	217	1278
Agro-forestry	1	13	0	13	0	0	0	13	0	13
Capacity Building and Group Dynamics	7	213	58	271	24	35	59	237	93	330
Crop Production	65	2194	464	2658	319	121	440	2513	585	3098
Entrepreneurship Development	12	339	83	422	63	27	90	402	110	512
Fisheries	3	63	50	113	10	5	15	73	55	128
Fruits	16	540	82	622	58	12	70	598	94	692
Group Dynamics and Farmers Organization	1	19	0	19	1	0	1	20	0	20
Integrated Nutrient Management	2	32	3	35	5	5	10	37	8	45
Integrated Water Management	4	92	12	104	10	12	22	102	24	126
Livestock Production and Management	19	427	223	650	80	134	214	507	357	864
Medicinal and Aromatic Plants	1	0	22	22	0	23	23	0	45	45
Natural Resource Management	8	236	36	272	37	45	82	273	81	354
Nutrition Security	28	193	906	1099	55	511	566	248	1417	1665
Ornamental Plants	1	51	0	51	8	0	8	59	0	59
Plant Protection	74	3681	511	4192	687	222	909	4368	733	5101
Plantation Crops	2	45	10	55	5	4	9	50	14	64
Processing and Value addition	16	329	194	523	45	80	125	374	274	648
Production of Inputs at site	4	82	72	154	12	53	65	94	125	219
Soil Health and Fertility Management	20	740	102	842	89	30	119	829	132	961
Spices	2	75	0	75	3	0	3	78	0	78
Vegetable Crops	17	544	212	756	59	18	77	603	230	833
Women Empowerment	11	9	307	316	0	78	78	9	385	394
<b>Total</b>	<b>366</b>	<b>11217</b>	<b>3607</b>	<b>14824</b>	<b>1804</b>	<b>1464</b>	<b>3268</b>	<b>13021</b>	<b>5071</b>	<b>18092</b>

## Gujarat

Technology backstopping of 3877 extension functionaries was done through organizing 113 training courses. Majority of courses were organized in areas such as Capacity Building and Group Dynamics (47 courses) with 1639 participants, Crop Production

(23 courses) with 862 participants, plant protection (19) with 600 participants and Soil Health and Fertility Management (6 courses) with 141 participants etc. Information about trainings is given in Table 4.10.



**Table 4.10 Training courses for extension personnel in Gujarat.**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agricultural Engineering	1	18	2	20	0	0	0	18	2	20
Agricultural Extension	1	30	0	30	0	0	0	30	0	30
Agro-forestry	1	30	3	33	10	2	12	40	5	45
Capacity Building and Group Dynamics	47	432	191	623	642	374	1016	1074	565	1639
Crop Production	23	603	34	637	139	86	225	742	120	862
Group Dynamics and farmers organization	1	85	0	85	0	0	0	85	0	85
Livestock Production and Management	1	20	0	20	2	0	2	22	0	22
Nutrition Security	3	1	66	67	0	21	21	1	87	88
Plant Protection	19	499	41	540	55	5	60	554	46	600
Production of Inputs at site	2	38	4	42	16	12	28	54	16	70
Protective cultivation	1	40	0	40	11	0	11	51	0	51
Soil Health and Fertility Management	6	89	22	111	23	7	30	112	29	141
Spices	1	17	0	17	4	0	4	21	0	21
Vegetable Crops	4	16	0	16	80	46	126	96	46	142
Women Empowerment	2	0	0	0	0	61	61	0	61	61
<b>Total</b>	<b>113</b>	<b>1918</b>	<b>363</b>	<b>2281</b>	<b>982</b>	<b>614</b>	<b>1596</b>	<b>2900</b>	<b>977</b>	<b>3877</b>



## Goa

In Goa, 2 KVKs (North Goa and South Goa) organized 10 training courses for 242 extension workers (Table

4.11). Efforts for developing capacity of extension workers are needed in the state.

**Table 4.11 Training courses for extension personnel in Goa**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agricultural Extension	8	88	51	139	40	24	64	128	75	203
Fisheries	1	12	4	16	6	0	6	18	4	22
Production of Inputs at site	1	9	8	17	0	0	0	9	8	17
<b>Total</b>	<b>10</b>	<b>109</b>	<b>63</b>	<b>172</b>	<b>46</b>	<b>24</b>	<b>70</b>	<b>155</b>	<b>87</b>	<b>242</b>

## Sponsored Trainings

In Maharashtra, Gujarat and Goa, 38583 participants were trained through 950 training courses, which were sponsored by different agencies/organizations. About

33.06% of the participants were represented SC/ST category in training courses. State-wise training details are given below:

## Maharashtra

In Maharashtra, 529 sponsored training programs were conducted with participation of 19583 trainees. Majority of courses represented training areas like Plant Protection (85 courses) with 3085 participants, entrepreneurship development (71 courses) with 4303 participants, Livestock Production and Management (66 courses) with 2278 trainees and crop production (63 courses) with 2372 participants. Component wise and category-wise training details are reported in Table 4.12.



**Table 4.12 Training courses for sponsored trainings in Maharashtra**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agricultural Engineering	12	228	44	272	34	15	49	262	59	321
Agricultural Extension	10	198	45	243	13	7	20	211	52	263

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Capacity Building and Group Dynamics	11	190	53	243	44	80	124	234	133	367
Crop Production	63	1481	286	1767	469	136	605	1950	422	2372
Entrepreneurship Development	71	2887	1129	4016	223	64	287	3110	1193	4303
Fisheries	3	43	52	95	10	5	15	53	57	110
Fruit technology	32	679	103	782	217	41	258	896	144	1040
Group Dynamics and Farmers Organization	1	19	0	19	1	0	1	20	0	20
Integrated Nutrient Management	2	32	3	35	5	5	10	37	8	45
Integrated Water Management	4	92	12	104	10	12	22	102	24	126
Livestock Production and Management	66	1557	285	1842	286	150	436	1843	435	2278
Medicinal and Aromatic Plants	1	6	42	48	2	2	4	8	44	52
Mushroom Production	1	16	9	25	0	0	0	16	9	25
Natural Resource Management	1	0	10	10	0	5	5	0	15	15
Nursery Management	1	12	0	12	3	0	3	15	0	15
Nutrition Security	10	77	66	143	134	189	323	211	255	466
Plant Protection	85	1968	421	2389	503	193	696	2471	614	3085
Plantation crops	2	45	10	55	5	4	9	50	14	64
Processing and Value addition	28	440	565	1005	86	195	281	526	760	1286
Production of Inputs at site	17	196	132	328	91	37	128	287	169	456
Soil Health and Fertility Management	52	1113	114	1227	173	25	198	1286	139	1425
Spices	9	439	15	454	36	10	46	475	25	500
Vegetable Crops	45	369	99	468	261	136	397	630	235	865
Women Empowerment	2	2	16	18	4	62	66	6	78	84
<b>Total</b>	<b>529</b>	<b>12089</b>	<b>3511</b>	<b>15600</b>	<b>2610</b>	<b>1373</b>	<b>3983</b>	<b>14699</b>	<b>4884</b>	<b>19583</b>

## Gujarat

In case of Gujarat, 394 sponsored training courses were conducted with active participation of 18301 trainees. Major attention was given on crop production (122 courses with 6178 participants), Agriculture extension

(63 courses with 3136), vegetable crop (44 courses 1844 participants) and Plant protection (36 courses with 1850 participants) etc. Training area-wise and category-wise details are given in Table 4.13.



**Table 4.13 Training courses for sponsored trainings in Gujarat**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agricultural Engineering	9	125	164	289	144	20	164	269	184	453
Agricultural Extension	63	1740	707	2447	247	442	689	1987	1149	3136
Agro Forestry	1	22	18	40	0	0	0	22	18	40
Capacity Building and Group Dynamics	4	0	0	0	63	47	110	63	47	110
Crop Production	122	1973	580	2553	2035	1590	3625	4008	2170	6178
Entrepreneurship Development	2	0	67	67	0	2	2	0	69	69
Fruit Technology	5	222	10	232	36	3	39	258	13	271
Livestock Production and Management	35	190	453	643	372	434	806	562	887	1449
Nutrition Security	2	52	30	82	8	0	8	60	30	90
Plant Protection	36	858	289	1147	378	325	703	1236	614	1850
Plantation Crops	4	65	43	108	11	16	27	76	59	135
Processing and Value addition	4	0	63	63	2	88	90	2	151	153
Production of Inputs at site	9	262	108	370	35	42	77	297	150	447
Soil Health and Fertility Management	11	356	15	371	85	32	117	441	47	488
Spices	6	323	37	360	7	1	8	330	38	368
Tuber crop	1	0	0	0	5	16	21	5	16	21



Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Vegetable crop	44	385	107	492	681	671	1352	1066	778	1844
Women empowerment	36	0	491	491	0	708	708	0	1199	1199
<b>Total</b>	<b>394</b>	<b>6573</b>	<b>3182</b>	<b>9755</b>	<b>4109</b>	<b>4437</b>	<b>8546</b>	<b>10682</b>	<b>7619</b>	<b>18301</b>

## Goa

In Goa, 27 training programmes were organized with 699 participants involving 379 male and 320 female. Major training areas considered for entrepreneurship

development and agricultural extension. About 30.90 % participants were represented SC/ST category. Details of training courses are given in Table 4.14.

**Table No. 4.14 Training courses for sponsored trainings in Goa**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agricultural Extension	6	60	36	96	32	22	54	92	58	150
Capacity Building and Group Dynamics	1	8	27	35	0	6	6	8	33	41
Entrepreneurship Development	7	88	56	144	36	19	55	124	75	199
Fisheries	4	44	25	69	18	6	24	62	31	93
Plant Protection	5	62	22	84	31	9	40	93	31	124
Processing and Value Addition	4	0	55	55	0	37	37	0	92	92
<b>Total</b>	<b>27</b>	<b>262</b>	<b>221</b>	<b>483</b>	<b>117</b>	<b>99</b>	<b>216</b>	<b>379</b>	<b>320</b>	<b>699</b>

## Vocational Training

In Maharashtra and Gujarat, 8441 participants were trained through 286 courses on different areas of

vocations/enterprises. State-wise details are reported as under:

## Maharashtra

Vocational trainings are very important to organize at district level especially for rural youth to start their agri-business or enterprise. In Maharashtra, 6038 participants were trained through 212 courses. Major emphasis was given on areas like livestock production

and management (68 courses with 2298 participants), entrepreneurship development (35 courses with 724 participants), value addition (22 courses with 679 participants) etc. Training area-wise and category-wise details are given in Table 4.15.



**Table 4.15 Training courses for vocational trainings in Maharashtra**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agricultural Engineering	5	80	8	88	29	0	29	109	8	117
Agricultural Extension	13	332	128	460	65	33	98	397	161	558
Capacity Building and Group Dynamics	1	20	5	25	0	0	0	20	5	25
Crop Production	17	238	42	280	75	38	113	313	80	393
Entrepreneurship Development	35	425	147	572	122	30	152	547	177	724
Fisheries	2	67	4	71	12	0	12	79	4	83
Fruit Technology	12	208	59	267	54	27	81	262	86	348
Livestock Production and Management	68	1101	230	1331	800	167	967	1901	397	2298
Nursery Management	3	9	44	53	4	19	23	13	63	76
Nutrition Security	1	0	11	11	0	7	7	0	18	18
Ornamental Plants	1	18	5	23	1	0	1	19	5	24
Plant Protection	10	116	40	156	16	4	20	132	44	176
Plantation crops	1	20	5	25	5	0	5	25	5	30
Processing and Value addition	22	211	343	554	37	88	125	248	431	679
Production of Inputs at site	5	123	35	158	6	0	6	129	35	164
Soil Health and Fertility Management	7	73	9	82	2	3	5	75	12	87
Vegetable Crops	6	65	23	88	13	5	18	78	28	106
Women Empowerment	3	0	127	127	0	5	5	0	132	132
<b>Total</b>	<b>212</b>	<b>3106</b>	<b>1265</b>	<b>4371</b>	<b>1241</b>	<b>426</b>	<b>1667</b>	<b>4347</b>	<b>1691</b>	<b>6038</b>

## Gujarat

To develop entrepreneurship among rural youth 74 vocational trainings were organized for benefitting the 2403 participants. Main focus was given on training areas such as women empowerment (14

courses with 480 participants), plant protection (14 courses with 513 participants), crop production (11 courses with 308 participants) etc. Training area-wise and category-wise details are given in Table 4.16.



**Table 4.16 Training courses for vocational trainings in Gujarat**

Training Areas	No. of Courses	No. of Participants			No. of Participants			No. of Participants		
		General			SC/ST			Total		
		Male	Female	Total	Male	Female	Total	Male	Female	Total
Agricultural Engineering	1	0	0	0	20	0	20	20	0	20
Agricultural Extension	1	14	4	18	0	0	0	14	4	18
Crop Production	11	88	31	119	73	116	189	161	147	308
Entrepreneurship Development	5	81	35	116	22	0	22	103	35	138
Livestock Production and Management	10	102	0	102	71	142	213	173	142	315
Nutrition Security	4	0	0	0	73	64	137	73	64	137
Plant Protection	14	389	25	414	45	54	99	434	79	513
Processing and Value addition	8	0	186	186	0	126	126	0	312	312
Production of Inputs at site	2	0	0	0	25	23	48	25	23	48
Soil Health and Fertility Management	2	36	13	49	13	4	17	49	17	66
Vegetable Crops	2	0	0	0	33	15	48	33	15	48
Women Empowerment	14	0	331	331	0	149	149	0	480	480
<b>Total</b>	<b>74</b>	<b>710</b>	<b>625</b>	<b>1335</b>	<b>375</b>	<b>693</b>	<b>1068</b>	<b>1085</b>	<b>1318</b>	<b>2403</b>



## Chapter 5

# Extension Activities

Focus on virtual extension is being given to reach the unreached in short time. In this context, a combination of extension methods and ICT techniques will play a greater role in technology transfer. Extension activities are very important for creating awareness, exposure and large scale adoption among farmers and extension functionaries. In Zone-VIII, a large number of extension activities were organized by KVKs of Maharashtra, Gujarat and Goa. The major activities like advisory service (23286), scientists visit to farmers fields (7232), diagnostic visits (3777), field days (716), group discussions (1155), kisan goshies (544), film shows (864), self-help groups (267), kisan mela (109), exhibitions (159), plant/animal health camps (88), farm science clubs

(87), ex-trainees sammelan (35), farmers' seminars (389), method demonstrations (1057), celebrations of important days (1261), exposure visits (229) etc. with the participation of 1680285 farmers and 35746 extension personnel were performed. Out of total participants, about 20.19% farmers represented the SC/ST category. Similarly, about 18.01% farmers belonged to female group under different extension activities (Table 5.1). In addition, 82094 number of other extension activities viz. use of electronic media, extension literature, newspaper coverage, popular articles, animal health camp, radio and TV talks were taken up by the KVKs to reach the unreached people. Mobile based agro-advisory was also given by the KVKs to the farmers.



**Table 5.1 Number of extension activities and participants**

Extension Activities	No. of Programmes	No. of Participants (General)			No. of Participants(SC/ST)			Total Farmers (General + SC/ST)			No. of Extension Personnel		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Maharashtra	25987	867725	102418	970143	121037	37476	158513	988762	139894	1128656	21675	6572	28246
Gujarat	24195	226568	50436	277004	106625	73024	179649	381199	156945	538164	6565	787	7349
Goa	832	8910	6871	15781	548	579	1127	9380	7315	16695	56	54	110
Total	51014	1103203	159725	1262912	228210	111079	339289	1377555	302774	1680285	28296	7413	35705

## Extension Activities in Maharashtra

In popularization of farm and livestock related technologies, extension activities played a major role in distant places. In Maharashtra, 25987 extension programmes were organized where 1128656 farmers and 28246 extension personnel benefited. Major extension activities were covered such as advisory

services (11645 programmes) with participation of 503829 farmers and 5212 extension officials; scientists' visit to farmers' fields (4523) with 27533 farmers and 2302 extension workers' participation; diagnostic visits (2680) with beneficiaries of 17046 farmers and 2440 extension official; etc. Activity-wise details of extension programmes are reported in Table 5.2.



**Table 5.2 Extension activities organized by KVKs in Maharashtra**

Extension Activities	No. of Programmes	No. of Participants (General)			No. of Participants (SC/ST)			Total Farmers (General + SC/ST)			No. of Extension Personnel		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Advisory Services	11645	380347	41036	421383	69363	13083	82446	449710	54119	503829	4054	1158	5212
Celebration of important days	776	25777	10172	35949	6025	4235	10260	31802	14407	46209	1822	992	2814
Diagnostic visits	2680	10186	2274	12460	3795	791	4586	13981	3065	17046	1971	470	2440
Exhibition	79	137176	15076	152252	7073	4634	11707	144249	19710	163959	1554	759	2313
Exposure visits	130	2711	474	3185	237	153	390	2948	627	3575	162	56	218
Ex-trainees Sammelan	20	638	122	760	101	31	132	739	153	892	70	3	73
Farm Science Club	82	2201	631	2832	558	268	826	2759	899	3658	339	79	418
Farmers' seminar /workshop	308	11900	2165	14065	1382	462	1844	13282	2627	15909	670	181	851
Field Days	425	8945	1764	10709	1981	611	2592	10926	2375	13301	729	190	919
Film Show	190	14069	3825	17894	7728	3307	11035	21797	7132	28929	281	128	409
Group Discussions	807	11699	2628	14327	3127	1465	4592	14826	4093	18919	1172	252	1424
Kisan Gosti	365	7017	1679	8696	2349	1001	3350	9366	2680	12046	633	236	869
Kisan Melas	100	10682	3199	13881	3291	1575	4866	13973	4774	18747	830	325	1155
Method Demonstrations	643	8514	2467	10981	4119	1740	5859	12633	4207	16840	876	342	1218

Extension Activities	No. of Programmes	No. of Participants (General)			No. of Participants (SC/ST)			Total Farmers (General + SC/ST)			No. of Extension Personnel		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Plant/ Animal health camps	51	2002	245	2247	583	155	738	2585	400	2985	129	25	154
Scientists' visit to farmers field	4523	19568	3364	22932	3567	1034	4601	23135	4398	27533	1858	444	2302
SHGs	210	1883	1857	3740	580	695	1275	2463	2552	5015	183	104	287
Others	2953	212410	9440	221850	5178	2236	7414	217588	11676	229264	4342	828	5170
<b>Total</b>	<b>25987</b>	<b>867725</b>	<b>102418</b>	<b>970143</b>	<b>121037</b>	<b>37476</b>	<b>158513</b>	<b>988762</b>	<b>139894</b>	<b>1128656</b>	<b>21675</b>	<b>6572</b>	<b>28246</b>

### Extension Activities Organized in Gujarat

In Gujarat, 24195 extension programmes were organized by the KVKs where 456653 farmers and 7390 extension officials participated. Main extension activities such as advisory services (11269) with participation of 184705 farmers and 490 extension

personnel; scientists' visit to farmers' fields (2595) benefited 9664 farmers and 640 extension personnel etc. were conducted for large scale technology dissemination and application. Extension activity-wise and category-wise details are furnished in Table 5.3.



**Table 5.3 Extension activities organized by KVKs in Gujarat**

Extension Activities	No. of Programmes	No. of Participants (General)			No. of Participants (SC/ST)			Total Farmers (General + SC/ST)			No. of Extension Personnel		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Advisory Services	11269	125557	14903	140460	31962	12283	44245	157519	27186	184705	447	43	490
Celebration of important days	469	15448	7761	23209	9040	7844	16884	24488	15605	40093	742	159	901
Diagnostic visits	970	1959	260	2219	1261	557	1818	3220	817	4037	139	12	151
Exhibition	71	2972	1828	4800	2419	1503	3922	5391	3331	8722	72	27	99
Exposure visits	96	1306	275	1581	684	624	1308	1990	899	2889	138	5	143
Ex-trainees Sammelan	13	216	44	260	5	58	63	221	102	323	39	2	41
Farm Science Club	5	0	0	0	55	0	55	55	0	55	0	0	0



Extension Activities	No. of Programmes	No. of Participants (General)			No. of Participants (SC/ST)			Total Farmers (General + SC/ST)			No. of Extension Personnel		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Farmers' seminar /workshop	75	2959	1035	3994	1780	1262	3042	4739	2297	7036	140	14	154
Field Days	277	4414	1465	5879	1478	1441	2919	5892	2906	8798	192	17	209
Film Show	621	7139	2774	9913	4311	3707	8018	11450	6481	17931	450	65	515
Group Discussions	301	2657	679	3336	2254	835	3089	4911	1514	6425	97	20	117
Kisan Ghosthis	162	3426	1123	4549	2574	1126	3700	6000	2249	8249	143	40	183
Kisan Melas	9	355	229	584	657	848	1505	1012	1077	2089	21	0	21
Method Demonstrations	406	2703	1396	4099	2988	2370	5358	5691	3766	9457	171	25	196
Plant/ Animal health camps	37	1254	109	1363	228	417	645	1482	526	2008	31	1	32
Scientists' visit to farmers field	2595	6375	965	7340	1593	731	2324	7968	1696	9664	613	27	640
SHGs	31	54	179	233	103	304	407	157	483	640	17	6	23
Others	6788	47644	15423	63067	43293	37172	80465	90937	52595	143532	3152	326	3475
<b>Total</b>	<b>24195</b>	<b>226438</b>	<b>50448</b>	<b>276886</b>	<b>106685</b>	<b>73082</b>	<b>179767</b>	<b>333123</b>	<b>123530</b>	<b>456653</b>	<b>6604</b>	<b>789</b>	<b>7390</b>

## Extension Activities in Goa

In Goa, farmers have different mindset towards farming. There is lot of potential to create agriculture related enterprises. In this state, 832 extension programmes were conducted in which 16908 farmers and 110 extension personnel got benefitted. Major extension activities such as Advisory services (372) benefiting 9007 farmers; Diagnostic visits (127) benefitting 408 farmers; Scientists visits to farmers field (114); Method demonstration (08) etc. were conducted for large scale technology dissemination and application. Extension activity-wise and category-wise details are given in Table 5.4.



**Table 5.4 Extension activities organized by KVKs in Goa**

Extension Activities	No. of Programmes	No. of Participants (General)			No. of Participants (SC/ST)			Total Farmers (General + SC/ST)			No. of Extension Personnel		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Advisory Services	372	5021	3687	8708	198	101	299	5219	3788	9007	0	0	0
Celebration of important days	16	257	197	454	66	25	91	323	222	545	15	9	24
Diagnostic visits	127	203	152	355	30	23	53	233	175	408	0	0	0

Extension Activities	No. of Programmes	No. of Participants (General)			No. of Participants (SC/ST)			Total Farmers (General + SC/ST)			No. of Extension Personnel		
		Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Exhibition	9	769	603	1372	53	50	103	822	653	1475	0	0	0
Exposure visits	3	128	101	229	8	6	14	136	107	243	0	0	0
Ex-trainees Sammelan	2	25	20	45	2	2	4	27	22	49	0	0	0
Farmers' seminar /workshop	6	68	54	122	7	6	13	75	60	135	0	0	0
Field Days	14	144	97	241	24	19	43	168	116	284	12	7	19
Film Show	53	864	678	1542	7	6	13	871	684	1555	0	0	0
Group Discussions	47	647	477	1124	22	15	37	669	492	1161	6	4	10
Kisan Ghosthis	17	126	112	238	23	21	44	149	133	282	15	16	31
Lecture delivered	8	86	68	154	10	8	18	96	76	172	0	0	0
Method Demonstrations	8	64	60	124	22	25	47	86	85	171	3	3	6
Scientists' visit to farmers field	114	159	99	258	32	21	53	191	120	311	0	0	0
SHGs	26	160	317	477	39	247	286	199	564	763	5	15	20
Soil health camp	3	32	25	57	1	1	2	33	26	59	0	0	0
Webinar	7	157	124	281	4	3	7	161	127	288	0	0	0
<b>Total</b>	<b>832</b>	<b>8910</b>	<b>6871</b>	<b>15781</b>	<b>548</b>	<b>579</b>	<b>1127</b>	<b>9458</b>	<b>7450</b>	<b>16908</b>	<b>56</b>	<b>54</b>	<b>110</b>

## Other Extension Activities

KVK experts have a major challenge of reaching to each corner of the village. In this context, mass communication can play a major role to get in touch with people resided at distant places. Electronic media, print media, digital media, and other related

extension activities were used for wider dissemination of farm/livestock and other allied enterprise related technologies among different stakeholders. During the year under report, 37075 activities were organized by KVKs in the zone. State-wise and activity-wise details are reported in Table 5.5.

**Table 5.5 Other extension activities organized by KVKs across the Zone**

Other Extension Activities	Maharashtra (No.)	Gujarat (No.)	Goa (No.)	Total (No.)
Animal health camp (No. of animals treated)	5156	907	0	6063
Electronic Media	162	31	6	199
Extension Literature	23034	3461	8	26503
Newspaper Coverage	2753	905	41	3699
Popular Articles	2667	190	2	2859
Radio Talks	806	54	3	863
TV Talks	151	73	1	225
Others	2346	39337	0	41683
<b>Total</b>	<b>37075</b>	<b>44958</b>	<b>61</b>	<b>82094</b>

# Seed and Planting Material Production

## Chapter 6

### Production of Technological Inputs

Ensuring availability of quality seeds, planting materials, livestock breeds and bio-products is the primary requirement of the farmers to attain higher productivity in agriculture and allied sectors. KVKs are actively involved in production of quality seeds, planting materials, livestock, bio-products and

providing to the farmers and other stakeholders. During the period under report, KVKs produced 12734.51 q seeds of crop varieties, 98304.55 lit liquid and 68380.73 kg solid bio-products, 25.44 lakh number of planting materials of varieties, 36.37 lakh number of planting materials of hybrids and 9.84 lakh number of livestock and fingerlings (Table 6.1).



**Table 6.1 Production and supply of technological inputs**

Category		Quantity	Value (Rs.in lakh)	Farmers (No)
Seed of crop varieties (q)		12734.51	522.88	20106
Bio-products	Liquid (lit)	98304.55	162.21	25205
	Solid (Kg)	68380.73	99.98	16838
Planting material of crops (No. in lakh)		25.44	203.95	26370
Planting material of crops hybrid (No. in lakh)		36.37	52.88	5392
Livestock and fisheries (No. in lakh)		9.84	142.10	7712
<b>Total</b>			<b>1184.00</b>	<b>101623</b>

### Seeds

In the year 2021, the quality seed production by KVKs of Maharashtra, Gujarat and Goa was 7340.44 q,

3777.4 q and 58.67q, respectively. The crop category-wise information of seed production is reported in Table 6.2.

**Table 6.2 Quality seed produced by the KVKs in the Zone**

State	Crop Category	Quantity (q)	Total Value (Rs.)	Sold to No. of Farmers
Maharashtra	Cereals	820.87	2590794	2239
	Commercial crops	100	30000	3
	Fodder Crops	17.17	105168	201
	Oilseed Crops	3415.51	17423955	3538
	Pulses	2814.13	20014728	4181



State	Crop Category	Quantity (q)	Total Value (Rs.)	Sold to No. of Farmers
	Spices	143	385100	94
	Vegetable crops	29.76	2443500	427
	<b>Total</b>	<b>7340.44</b>	<b>42993245</b>	<b>10683</b>
<b>Gujarat</b>	Cereals	2011.35	3091379	2043
	Commercial crops	173.16	445142	29
	Fodder Crops	5.5	220000	62
	Oilseed Crops	1014.79	2277295	1079
	Pulses	544.58	2320258	827
	Spices	11.98	278213	320
	Vegetable crops	8.29	55288	40
	Fiber crops	7.75	4745	0
	<b>Total</b>	<b>3777.4</b>	<b>8692320</b>	<b>4400</b>
<b>Goa</b>	Cereals	53.22	159675	0
	Vegetable crops	5.45	442684	5023
	<b>Total</b>	<b>58.67</b>	<b>602359</b>	<b>5023</b>
	<b>G.Total</b>	<b>11176.5</b>	<b>52287924</b>	<b>20106</b>

## Bio-products

The KVKs of Maharashtra have produced 59835.2 kg (solid) and 95393.6 lit (liquid) quality bio-products, whereas 4444 kg (solid) and 2911 lit (liquid) was produced by KVKs in Gujarat and 4101.5 kg (solid) by North and South Goa KVKs. Cost of cultivation was reduced by the farmers by using bio-fertilizers and bio-pesticides. In Gujarat, farmers are more eager to adopt bio-fertilizers and bio-pesticides. The category-wise details of bio-products production is given in Table 6.3.



**Table 6.3 Bio-products produced by the KVKs and sold to the farmers**

State	Category	Form	Quantity	Total Value (Rs.)	Sold to No. of Farmers
<b>Maharashtra</b>	Bio fertilizers	Solid (Kg)	2871.5	527185	2131
		Liquid (lit)	55327.6	10580029	13030
	Bio fungicides	Solid (Kg)	22108.5	3002984	4874
		Liquid (lit)	22976	3255130	6780
	Bio pesticides	Solid (Kg)	34855.2	6318943	8921
		Liquid (lit)	15601	1546030	3609
	Micro Nutrients mixture	Liquid (lit)	1489	307880	493
	<b>Total</b>	<b>Solid (Kg)</b>	<b>59835.2</b>	<b>9849112</b>	<b>15926</b>
		<b>Liquid (lit)</b>	<b>95393.6</b>	<b>15689069</b>	<b>23912</b>
<b>Gujarat</b>	Bio fertilizers	Solid (Kg)	4444	65150	84
		Liquid (lit)	782	67760	605
	Bio pesticides	Liquid (lit)	879	462800	688

State	Category	Form	Quantity	Total Value (Rs.)	Sold to No. of Farmers
	Bio agent	Liquid (lit)	1150	0	0
	Vermiwash	Liquid (lit)	100	1000	0
	Total	Solid (Kg)	4444	65150	84
		Liquid (lit)	2911	531560	1293
Goa	Other	Solid (Kg)	4101.5	83470	828
	Total	Solid (Kg)	4101.5	83470	828
	Grand total	Solid (Kg)	68380.7	9997732	16838
		Liquid (lit)	98304.6	16220629	25205

### Planting Material of Crops

In the year 2021, the quality planting material production of crops by KVKs of Maharashtra, Gujarat and Goa was 15.37 lakh, 9.62 lakh and 0.43 lakh,

respectively. In Maharashtra, KVKs have given more focus on developing horticulture nurseries at their centers. The crop category-wise details of planting material production of crops are reported in Table 6.4.



**Table 6.4 Planting material produced by the KVKs**

State	Crop Category	Quantity (No.)	Total Value (Rs)	Sold to No. of Farmers
Maharashtra	Commercial crops	7238	79230	60
	Flower crops	30192	66329	106
	Fodder Crops	255140	391980	142
	Forest species	24192	198840	107
	Fruit crops	329422	14833967	7288
	Medicinal and Aromatic crops	2716	46620	45
	Ornamental plants	7307	92140	490
	Plantation crops	107256	540067	283
	Spices	8143	142635	16
	Tuber crop	50	5000	10
	Vegetable crops	765793	1083917	1793
	<b>Total</b>	<b>1537449</b>	<b>17480725</b>	<b>10340</b>
Gujarat	Commercial crops	12000	131280	90
	Flower crops	10790	10790	40
	Fodder Crops	73500	40900	417
	Forest species	4300	4000	907
	Fruit crops	29027	1065937	1841

State	Crop Category	Quantity (No.)	Total Value (Rs)	Sold to No. of Farmers
	Ornamental Plants	2020	60000	203
	Plantation crop	3378	94777	57
	Vegetable Crops	827485	697716	4922
	<b>Total</b>	<b>962500</b>	<b>2105400</b>	<b>8477</b>
<b>Goa</b>	Fruit crops	203	8120	146
	Ornamental plants	2156	86240	1479
	Plantation crops	35277	374867	3116
	Spices	390	17315	188
	Vegetable crop	<b>5618</b>	<b>446385</b>	<b>2669</b>
	<b>Total</b>	<b>43644</b>	<b>932927</b>	<b>7598</b>
	<b>Grand Total</b>	<b>2543593</b>	<b>20519052</b>	<b>26415</b>

### Planting Material of Crop Hybrids

In the Zone, the quality planting material production of crop hybrids by KVKs of Maharashtra and Gujarat

was 30.99 lakh and 5.37 lakh, respectively. The crop category-wise details of planting material production of crop hybrids are reported in Table 6.5.



**Table 6.5 Planting material of hybrid crops produced**

State	Crop Category	Quantity (No.)	Total Value (Rs)	Sold to No. of Farmers
<b>Maharashtra</b>	Fodder Crops	237502	245122	238
	Fruit crops	8471	233170	536
	Ornamental plants	70	12300	35
	Vegetable crops	2853612	3536021	3222
	<b>Total</b>	<b>3099655</b>	<b>4026613</b>	<b>4031</b>
<b>Gujarat</b>	Fodder	112500	<b>64500</b>	<b>52</b>
	Plantation Crop	2120	<b>848000</b>	<b>107</b>
	Vegetable crops	416450	<b>348353</b>	<b>882</b>
	Commercial crop	6400	70412	320
	<b>Total</b>	<b>537470</b>	<b>1331265</b>	<b>1361</b>
	<b>G. Total</b>	<b>3637125</b>	<b>5357878</b>	<b>5392</b>

### Livestock and Fisheries

During the reporting period, the quality livestock and fingerlings production by KVKs of Maharashtra and Gujarat was 9.66 lakh and 0.17 lakh respectively.

KVKs of Maharashtra did admirable work in fingerlings production. The crop category-wise information of livestock and fisheries production is given in Table 6.6.



Table 6.6 Quality livestock and fingerlings production

State	Category	Quantity (No.)	Total Value (Rs)	Sold to No. of Farmers
Maharashtra	Dairy cow	12	390000	1
	Fishery	812125	997060	296
	Goat	234	1098307.	95
	Poultry	153922	10683864	5672
	<b>Total</b>	<b>966293</b>	<b>13169231</b>	<b>6064</b>
Gujarat	Dairy cow	18	613500	26
	Goat	43	152500	16
	Poultry	103	31415	34
	<b>Total</b>	<b>164</b>	<b>797415</b>	<b>76</b>
Goa	Poultry	17143	243344	1623
	<b>Total</b>	<b>17143</b>	<b>243344</b>	<b>1623</b>
	<b>G.Total</b>	<b>983600</b>	<b>14209990</b>	<b>7763</b>



# Farmer Centric and Skill Oriented Programmes

## Chapter 7

The discussion of farmer-centric and skill-oriented programmes is covered in this chapter and important results are emphasized. The discussion includes initiatives like NICRA, Farmers FIRST, ARYA, TSP, DAMU, NARI, and skill-oriented programmes supported by ASCI. These programmes have demonstrated their impact on entrepreneurship, household farming, nutrition, skill development and climate resilience.

### National Innovations in Climate Resilient Agriculture (NICRA)

National Innovations in Climate Resilient Agriculture (NICRA) is a network project of the Indian Council of Agricultural Research (ICAR) launched in February 2011. Further next phase started in the year 2021. The project aims to enhance the resilience of Indian agriculture to climate change and climate vulnerability through strategic research and technology demonstrations. The research covers the adaptation and mitigation of crops, livestock, fisheries and natural resource management. The project consists of four components viz. Strategic Research, Technology Demonstrations, Capacity Building and Sponsored/ Competitive Grants.

### Objectives

1. To enhance the resilience of Indian agriculture covering crops, livestock and fisheries to climatic variability and climate change through the development and application of improved production and risk management technologies
2. To demonstrate site specific technology packages on farmers' fields for adapting to current climate risks
3. To enhance the capacity building of scientists and other stakeholders in climate resilient agricultural research and its application.

NICRA is operational in 11 KVKs (3 existing and 8 new KVKs) in the states of Maharashtra, Gujarat and Goa in Zone VIII. ATARI, Pune monitors the performance of NICRA KVKs namely Beed-I, Osmanabad, Latur, and Jalna-I the new KVKs, whereas Ahmednagar-I and Nandurbar KVKs are continued from the last phase in the state of Maharashtra. In Gujarat state Narmada, Dahod, Panchmahal are new KVKs while Banaskantha-I is continued from last phase. KVK North Goa is selected for the project from Goa state. Brief profile of identified villages of each NICRA center is given in Table 1, Table 2 and Table 3.

### 7.1 Brief profile of identified villages under NICRA in Maharashtra

Name of KVK	Names of Adopted Villages	Agro climatic zone	Major crops grown	Rainfall (mm)	Vulnerability situation
Ahmednagar-I	Khadakewake	Western Plateau and Hills Region	Pearl millet, Soybean, Cotton, Sorghum, Fodder crops	752.71	Drought
Jalna-I	Pokal Wadagon, Punegeaon	Western Plateau and Hills Region	Cotton, Jowar, Red gram, Bengal gram, Wheat, Bajra	960.49	Drought
Nandurbar	Katri	Western Plateau and hills region	Maize, Sorghum, Black gram, Pigeon pea, Chickpea, Mango	845.45	Heat stress and drought
Beed-I	Rakshaswadi, Rajewadi	Western Plateau and Hills Region	Pearl millet, Cotton, Sorghum, Pigeon pea, soybean, Mango	936.03	Drought
Latur	ITTI Nagapur, Chincholirao Wadi	Western Plateau and Hills Region	Soybean, Sorghum, Pigeon pea, Green gram, Sunflower	1070.44	Drought
Osmanabad	Sarola	Western Plateau and Hills Region	Pigeon pea, Sorghum, Black gram, Soybean, Sunflower	1032.97	Drought

## 7.2 Brief profile of identified villages under NICRA in Gujarat

Name of KVK	Names of Adopted Villages	Agro climatic zone	Major crops grown	Rainfall (mm)	Vulnerability situation
Panchmahal	Nesada	Gujarat Plains and Hills Region	Maize, Paddy, Pigeon pea, Castor	1030.14	Drought
Banaskantha-I	Bhadli	Gujarat Plains and Hills Region	Bajra, Castor, Pulses crop, Groundnut, Cotton	628.52	Drought
Narmada	Bedchha	Gujarat Plains and hills region	Cotton, Pigeon pea, Rice, Sorghum	1211.53	Drought
Dahod	Moti Handi	Gujrat Plains and Hills Region	Maize, Paddy, Wheat, Gram, Soybean, Pigeon pea	982.73	Drought

## 7.3 Brief profile of identified villages under NICRA in Goa

Name of KVK	Names of Adopted Villages	Agro climatic zone	Major crops grown	Rainfall (mm)	Vulnerability situation
North Goa	Mayem	Western Coast Plains and Ghat region	Rice, Pulses crop, Cashew, Mango, Sugarcane	3204.46	Drought

## Rainfall in NICRA Villages

Crops and animals suffered as a result of irregular rainfall, the number of dry spells, intense rainstorms, and water logging conditions that were seen during the crop growing period. In Maharashtra, the *Kharif* crops of green gram, black gram, maize, and soybean were severely impacted by dry periods and poor rainfall in July and August. The harvesting of *Kharif* crops was hampered by the heavy rains in September and October. Long dry periods were also noted in the states of Gujarat, Maharashtra and Goa.

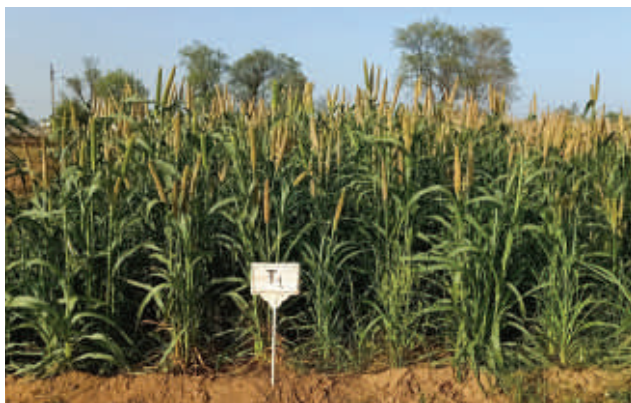
## Technology Modules and Interventions

Implemented climate-resilient practices and technology are divided into four modules: Institutional mechanism, Natural resource management, Crop production systems, and Livestock & Fisheries production systems. Table 7.4 provides a summary of the NICRA project's ongoing activities in the states of Gujarat and Maharashtra.

**Table 7.4 Summary of activities carried out during 2021**

Name of KVK	NRM		Crop		Livestock		Capacity Building		Extension Activities	
	Demo (No.)	Area (ha)	Demo (No.)	Area (ha)	Demo (No.)	No. of animals/ units	No. of Trainings	Farmers	No. of Programmes	Farmers
<b>Maharashtra (03 KVK)</b>										
Ahmednagar I	195	43.75	125	43	70	30 units & 3 ha area	11	597	7	250
Jalna I	363	327	307	123.2	510	720	27	814	28	721
Nandurbar	147	89	350	133	254	322	27	758	12	300
<b>Sub total</b>	<b>705</b>	<b>459.76</b>	<b>782</b>	<b>299.2</b>	<b>834</b>	<b>1055</b>	<b>65</b>	<b>2169</b>	<b>47</b>	<b>1271</b>
<b>Gujarat (01 KVK)</b>										
Banaskantha I	0	0	58	29.2	240	505	18	308	29	123
<b>Grand total</b>	<b>705</b>	<b>459.76</b>	<b>840</b>	<b>328.4</b>	<b>1074</b>	<b>1560</b>	<b>83</b>	<b>2477</b>	<b>76</b>	<b>1394</b>





### Institutional Intervention

A custom hiring centre for farm implements has facilitated the farmers in the adoption of new implements for demonstration and checking the feasibility of the improved farm implements in the

prevailing conditions. Concerning custom hiring centres (CHCs), 566 farmers of NICRA villages used 19 different farm implements to cover 240.03 ha area for timely sowing and other cultural operations. Rs. 22720/- revenue was generated. The details are given in Table 7.5

**Table 7.5 Details of Custom Hiring Centre (CHC)**

State	KVK	Implement (No)	Area covered (ha)	No. of Farmers	Revenue generated through CHGs (Rs.)
Maharashtra	Ahmednagar I	4	15.3	28	3100
Maharashtra	Nandurbar	10	116	414	15035
Gujarat	Banaskantha I	5	109	124	4585
<b>Zone</b>	<b>Grand total</b>	<b>19</b>	<b>240.3</b>	<b>566</b>	<b>22720</b>



**Table 7.6 NRC items to be purchased under TDC for the year 2021-22 of new KVKs**

S. No	Name of KVK	Name of the equipment
1	Narmada	Thresher, winnowing fan, spiral grader, Twin wheel hoe, Stalk fuller, Spray pump, Rain Gauge
2	Dahod	Tractor drawn seed cum fertilizer drill, cultivator, MB Plough, Rain gauge
3	Panchmahal	Tractor water tanker, Rain gauge
4	Beed	BBF Planter, Subsoiler, Sara Basin Yantra, Rain gauge
5	Osmanabad	Five Row BBF Planter, Rain gauge
6	Latur	BBF Planter, MB Plough, Sprayer, Rain gauge
7	Jalna	Sub soiler, Rain gauge, CRIDA bullock drawn planter 4, Rain gauge
8	North Goa	Sprayer Knapsack sprayer, Brush cutter, Conoweeder, Rain gauge

## Extension Activities

A total of 76 extension events were organised to inform the public about the negative consequences that climate change is having on agriculture and allied industries, as well as the necessity for immediate action. Total 1394 farmers benefitted including 974 male and 420 women farmers. Throughout the year, the NICRA-KVKs took part in SHG activities with about 199 farmers, including 185 women farmers. The details are given in Table 7.7.



**Table 7.7 Extension activities conducted under NICRA**

Name of activity	Number of Programmes	No. of Beneficiaries		
		Male	Female	Total
Agro advisory services	1	27	0	27
Animal health Camps	4	102	0	102
Audio conference	1	22	4	26
Celebration of important days	7	149	30	179
Diagnostic visits	13	98	8	106
Exposure visit	4	126	0	126
Farmers meeting	1	12	4	16
Field days	19	146	36	182
Formation of farmers groups	1	0	23	23
Group Discussion	1	19	5	24
Integrated farming system	2	20	10	30
Interaction of RAWE students with farmers	5	50	50	100
Method Demonstrations	10	153	31	184
SHGs activities	3	14	185	199
Any other	4	36	34	70
<b>Total</b>	<b>76</b>	<b>974</b>	<b>420</b>	<b>1394</b>

## Farmers FIRST Project

An October 2016 ICAR initiative Farmer FIRST (Farm, Innovations, Resources, Science and Technology) programme aims at enriching Farmers–Scientist interface, technology assemblage, application and feedback, partnership and institutional building and content mobilization. The basic concept is that the farmer would be in a centric role for research problem identification, prioritization, the conduct of experiments and its management in farmers' field conditions. The project is focused on enriching farmers' scientists interfaces; technology assemblage, application and feedback; partnership and

institutional building; content mobilization. Doubling of Farmer's Income can be possible through FFP as it emphasizes resource management, climate resilient agriculture, institutional building, production management including storage, marketing, supply chains, value chains, innovation systems, information systems, convergence with different national and state level developmental schemes, and most importantly farmer's involvement, etc. In the Zone, the Farmer FIRST project is implemented in 3 centers MPKV, Rahuri; NAU, Navsari; and JAU, Junagadh. The progress of the project during the reporting period is given below:



### Centre wise cluster of villages and farm families

S. No.	Centre	Cluster of Villages	No. of Farm Families
1.	MPKV, Rahuri	4 (Chinchvihire, Kangar, Tambhere and Kanadgaon)	1150
2.	NAU, Navsari	3 (Hanspor, Chijgam and Pathri)	713
3.	JAU, Junagadh	4 (Hadala, Deri Pipalia, Mav Jinjava and Nava Vaghaniya)	1884

### Centre wise and Module based Interventions

The Annual Progress of 2021 from three Centers is reported module-wise and center-wise in the following different tables. Under MPKV Rahuri, focus on nutrient-rich cultivars of red gram, and rabi sorghum, horticulture-based interventions on the

Bhagwa variety of pomegranate, integrated farming systems and suitable micro-enterprises for small and marginal farmers and farm women are given that is represented in Table 7.8. A cluster of four villages was covered under different modules and their active involvement was also ensured.



**Table 7.8 MPKV Rahuri Centre: Coverage of different technological interventions in the villages**

Modules	Crop/Animal/ Enterprise	Variety	Area covered (ha.)	Quantity produced (q)	No. of farmers
Crop based modules	Red gram	Phule Rajeshwari	20	420	50
	Soybean	Phule Sangam	20	620	50
	Chickpea	Phule Vikram	24	480	60
	sorghum	Phule Rewati	50	1025	125
Horticulture based module	Pomegranate production technology	Bhagwa	20	160	50
Entrepreneurship Module	Dal Mill	PKV mini dal mill	Two Women Self Help Group	10	20
NRM Based Module	In situ soil moisture conservation	Rabi Sorghum	50	00	125
Integrated Farming System based module	Backyard poultry	Kaveri	7200		120

Sugarcane GNS-10 was taken under crop based module in NAU Navsari Centre. Scientific Calf Rearing Practices under Livestock based module covering 70 crossbreed calves, Entrepreneurship

module for preparation of Value Added Products from Sapota, Mango and Watermelon, NRM based module for improving soil properties through soil amendment like gypsum was taken in Hanspor, Chijgam and Pathri villages.

**Table 7.9 NAU Navsari Centre: Coverage of different technological interventions in the villages**

Modules	Crop/Animal/ Enterprise	Variety	Area covered (ha.)	Quantity produced (q)	No. of farmers
Crop based modules	Sugarcane	GNS-10 (Co N 13073)	7.64	7010.846	17
Livestock based module	Scientific Calf Rearing Practices	-	70 crossbreed calf	-	70
	Application of Calf Starter feeding				
	First Aid Kit and Deworming				
Entrepreneurship module	Value Added Products form Sapota, Mango and Watermelon		-	-	51
NRM based module	Improving soil properties through soil amendment	Provided gypsum	-	-	271

**Table 7.10 JAU Junagadh: Coverage of different technological interventions in the villages**

Modules	Crop/Animal/ Enterprise	Variety	Area covered (ha.)	Quantity produced (q)	No. of farmers
Crop based module	Wheat	GW-496	20.23	856.74	100
	Gram	GJG-6	10.11	206.75	50
	Green gram	GG-4	6.47	-	40
	Sesame	GT-3	16.18	-	100
Horticulture based module	Brinjal	GJLB-4	5.44	-	34
	Okra Cowpea	GG-6 AVC-1		-	
	Bottle Gourd Ridge gourd and Cluster beans	Pusanavin GRG-2 Shanti		-	
	Watermelon	Rehaan		-	
	Muskmelon	Lyallpur 257		-	
Livestock based module	Buffalo	Jaffrabadi	50 buffaloes	1,26,300 (lit milk)	50
NRM Based Module	Introduction of high yielding variety (GG-6) of chickpea crop with Enriched compost, Chemical fertilizer (Macro and Micro nutrients) and Bio-fertilizer (Rhizobium +PSB+ KMB)	GG-6	10	-	50
Integrated Farming Systems (IFS) module (Crop Diversification)	Summer Crop: Green gram (GG4) + enriched compost	GG4	4.85	-	30

Crop, Horticulture, Livestock, NRM and IFS modules were taken in 04 clusters of villages covering 1884 Farm families. In the Crop module different field crops like wheat, gram, green gram, and sesame were covered whereas in the Horticulture module crops like brinjal, okra, cowpea, Bottle Gourd Ridge gourd,

Cluster beans, watermelon, muskmelon were covered. For the NRM module Enriched compost, chemical and Bio fertilizers were used. Jaffrabadi buffalo was covered under the livestock module. In the IFS module two components were taken like a crop with compost.





### Enhancement in Yield and Income

After the successful farmer- Scientist interface different interventions were planned and implemented at farmers' fields with their active

participation in the whole process of crop planning, field operations and post-harvest processing. The overall increase in yield and income realized by the farmers is given in Table 7.11. In some cases, the average income was raised by one and a half times.

**Table 7.11 Average yield and income of different crops demonstrations at farmers' fields**

FFP Centre	Crops	Avg. Yield (q/ha)	Gross Income (Rs/ha)	Net Income (Rs/ha)			
		Before	After	Before	After	Before	After
Mahatma PhuleKrishiVidyapeeth, Rahuri	Red gram	16.5	21	90750	115500	58350	81750
	Soybean	24.5	31	171500	217000	134600	180300
	Chickpea	15.5	20	82150	106000	48750	73000
	Sorghum	Grain- 18.50	Grain- 20.50	71950	80100	42850	51350
		Fodder-40	Fodder-45				
	Pomegranate	6.2	8	403000	520000	314000	435000
Junagadh Agricultural University	Wheat	37.2	42.35	73470	83641	40782	50391
	Gram	17.11	20.45	68466	81820	34965	45700
	NRM-Gram	17.92	21.27	98534	1,16,984	63,894	80844
	Livestock	07.42 lit/buffalo/day	08.58 lit/buffalo/day	106848	123552	86848	98072

### Capacity Building of Farmers

Need-based technological empowerment of the farmers was done by organizing training courses. Experts from concerned fields of different institutions including financial organizations and central and state line department officials guided the farmers

from identified clusters of three centers. Some of the successful farmers were also used as resource persons to share their success stories and improved profitable technologies. Number of programmes conducted during capacity building of farmers as per the thematic areas are given below in Table 7.12.

**Table 7.12 Capacity building programmes**

Thematic area	Number of programme		
	MPKV, Rahuri	NAU, Navsari	JAU, Junagadh
Capacity Building and Group Dynamics	0	0	4
Crop Production	6	0	15
Entrepreneurship Development	0	1	2

Thematic area	Number of programme		
	MPKV, Rahuri	NAU, Navsari	JAU, Junagadh
Farm Implements	0	0	1
Livestock Production and Management	2	1	3
Natural Resource Management	0	0	2
Nutritional Security	1	0	3
Plant Protection	0	0	9
Processing and Value Addition	0	1	2
Production of Inputs at site	0	0	3
Soil Health and Fertility Management	0	0	4
Women Empowerment	0	0	1
<b>Total</b>	<b>09</b>	<b>03</b>	<b>49</b>



### Extension Activities and Content Mobilization for Larger Technology Applications

Under this project, different technology-focused extension activities were organized. Diagnostic visits,

mobile-based advisory services, use of ICT tools, sending text and voice messages, developing well-tested content and onsite input management were emphasized (Table 7.13 and 7.14). Activities like Kisan Ghoshtis were organized at all three centers and one Kisan Mela was organized at JAU Junagadh.

**Table 7.13 Extension activities**

Programmes	Number of programme		
	MPKV, Rahuri	NAU, Navsari	JAU, Junagadh
Advisory Services	9	-	62
Celebration of important days	3	-	-
Diagnostic visits	5	-	32
Exhibition	1	-	1
Exposure visits	1	-	1
Ex-trainees Sammelan	-	-	-
Farm Science Club	-	-	-
Farmers' seminar/workshop	-	-	1
Field Day	-	5	5
Film Show	-	-	-

Programmes	Number of programme		
	MPKV, Rahuri	NAU, Navsari	JAU, Junagadh
Group discussions	5	-	21
Kisan Ghosthi	1	2	7
Kisan Mela	-	-	1
Method Demonstrations	-	-	14
Plant/ animal health camps	3	-	-
Any other	-	1	-
<b>Total</b>	<b>28</b>	<b>8</b>	<b>145</b>

An overview of activities carried out during content mobilization is given in Table No. 7.14 center and module-wise. Videos, Clips, and Messages were

shared on WhatsApp, text messages were also shared along with voice calls in 50 villages benefiting 2524 farmers.

**Table 7.14 Content mobilization related activities**

Module	Content Mobilization					No. of Text messages	No. of villages	No. of farmers
	WhatsApp			No. of voice calls				
	No. of chats	No. of videos	No. of clips	Outgoing	Incoming			
Crop based modules								
MPKV, Rahuri	200	4	0	300	200	0	4	285
NAU, Navsari	223	0	109	89	40	0	3	17
JAU, Junagadh	105	0	7	72	225	10	4	487
Total	528	4	116	461	465	10	11	789
Horticulture based modules								
MPKV, Rahuri	100	1	0	100	50	0	4	100
NAU, Navsari	150	0	121	61	37	0	3	309
JAU, Junagadh	48	2	8	100	50	18	3	246
Total	298	3	129	261	137	18	10	655
Enterprise based modules								
MPKV, Rahuri	50	0	0	50	25	0	2	15
NAU, Navsari	100	0	53	50	38	0	3	30
JAU, Junagadh	0	0	0	0	0	0	0	0
Total	150	0	53	100	63	0	5	45
Livestock based modules								
MPKV, Rahuri	50	1	0	300	150	0	4	170
NAU, Navsari	179	0	123	126	70	0	3	77
JAU, Junagadh	40	0	2	28	32	8	4	135
Total	269	1	125	454	252	8	11	382
NRM based modules								
MPKV, Rahuri	0	0	0	0	0	0	0	0
NAU, Navsari	126	0	64	78	50	0	3	217
JAU, Junagadh	36	5	7	10	23	10	4	115
Total	162	5	71	88	73	10	7	332



Module	Content Mobilization					No. of Text messages	No. of villages	No. of farmers
	WhatsApp			No. of voice calls				
	No. of chats	No. of videos	No. of clips	Outgoing	Incoming			
IFS/Crop diversification based module								
MPKV, Rahuri	229	0	214	157	103	0	3	223
NAU, Navsari	0	0	0	0	0	0	0	0
JAU, Junagadh	30	0	1	12	40	0	3	98
Total	259	0	215	169	143	0	6	321
Grand Total	1666	13	709	1533	1133	46	50	2524

### Attracting and Retaining Youth in Agriculture (ARYA) Project

In the past, two KVKs (Nagpur-I and Rajkot-I) were selected to execute the ARYA project, which aims to encourage youth in rural areas to start businesses in the agricultural and related service sectors to generate a sustainable income and find gainful work in a few districts. To engage in resource and capital-intensive activities like processing, value addition, and marketing, youth might create network groups. It supports efforts by demonstrating functional

linkages with various institutions and stakeholders for the convergence of opportunities offered under multiple programmes. With the addition of ten more centers in 2019 (Nashik-I, Osmanabad, Pune-II, Washim and Solapur-I in Maharashtra and Bhavnagar, Kheda, Navsari, Anand and Amreli in Gujarat), there are now 12 ARYA centers working through KVKs. A total of 96 training sessions were conducted in 2021 and 3632 youth trained. 264 rural youth have started their entrepreneurial units overall (Table 7.15).



**Table 7.15 Attracting and Retaining Youth in Agriculture (ARYA) Project**

State/ARYA centres	No. of training courses	No. of rural youth trained	No. of youth established units	No. of entrepreneurial units established	No of groups formed
<b>Maharashtra</b>					
Nagpur - I	10	860	15	21	27
Nashik - I	10	224	16	12	3
Osmanabad	7	99	1	20	7
Pune - II	9	300	39	39	1
Washim	7	324	59	59	9
Solapur - I	9	415	49	57	13
<b>Gujarat</b>					
Rajkot I	3	175	26	4	3

State/ARYA centres	No. of training courses	No. of rural youth trained	No. of youth established units	No. of entrepreneurial units established	No of groups formed
Bhavnagar	9	330	20	20	4
Kheda	9	38	28	28	7
Navsari	14	432	3	3	3
Anand	2	88	2	2	0
Amreli	7	347	6	0	0
Total	44	1410	85	57	17
Grand Total	96	3632	264	265	77

## Pulses Seed Hub Project

The Seed Hub Project is implemented at 8 locations in Maharashtra (Jalna-I, Dhule, Solapur-II, Beed-II, Amravati-II, Akola, Buldhana-II, Jalgaon-II), and 6 centers in Gujarat (Tapi, Navsari, Kheda, Rajkot-I, Panchmahal and Dahod) for the quality seed production of pulses. Major pulse crops, including pigeon pea, chickpea, black gram and green gram were grown for seed production in a few districts in

2021 through KVKs. There were 623.52 q seeds produced during the *Kharif* season. A total of 4107.17 q of seeds were produced during the rabi season. A total of 162.47 q seeds were generated during the summer. At designated centers, a seed processing plant is made available for the processing of pulse seeds. Additionally, farmers' fields in nearby communities are also producing high-quality seeds. The details are presented in Table 7.16.

**Table 7.16: Seed produced under Pulses Seed hub project in year 2021**

State	No. of KVKs	Crop	Area (Ha)	Target of seed production (q)	Achievement in seed production (q)
<b>Kharif</b>					
Maharashtra	2	Black Gram	16.4	232	40.18
Maharashtra	4	Green gram	20	1000	89.29
Maharashtra	5	Pigeon pea	201.21	1096	324.05
Gujarat	3	Pigeon pea	48	900	170
<b>Total</b>	<b>14</b>		<b>285.61</b>	<b>3228</b>	<b>623.52</b>
<b>Rabi</b>					
Maharashtra	8	Chick pea	324.8	5072	3692.57
Gujarat	6	Chick pea	109	2100	414.6
<b>Total</b>	<b>14</b>		<b>433.8</b>	<b>7172</b>	<b>4107.17</b>
<b>Summer</b>					
Gujarat	4	Green gram	61	725	162.47
<b>Total</b>	<b>61</b>	<b>725</b>		<b>162.47</b>	



### Tribal Sub Plan (TSP)

Major attention is being given to tribal people to raise their socio-economic status in tribal-dominated districts through different agencies. In this context, Tribal Sub Plan (TSP) is implemented through KVKs by organizing different activities related to agriculture, livestock, poultry, goat rearing and other rural-based enterprises.

In Zone, 11 KVKs (Amravati-I, Nandurbar, Nashik-I, Palghar, Raigad) are involved in organizing several

activities like capacity-building programmes, frontline demonstrations, on-farm trials, seed and planting material production and creating income-generating activities in tribal-dominated areas for their socio-economic development. The details of achievements are reported in Tables 7.17 and 7.18. from Maharashtra and Bharuch, Dahod, Dangs, Narmada, Tapi, Vadodara from Gujarat.

In Zone during 2021, 11 KVKs implemented mandated activities in tribal areas for the benefit of



**Table 7.17 Achievement under TSP in the zone**

Sr.No.	Description	Achievements
1	On-farm trials (Number of farmers)	843
2	Frontline demonstrations (Number of farmers)	6761
3	Farmers training (Number of farmers)	42102
4	Training of extension personnel (No.)	1141
5	Participants in extension activities (No.)	160488
6	Production of seed (q)	1166.165
7	Production of planting material (No.)	911299
8	Production of livestock strains and fingerlings (No.)	9663
9	Testing of soil, water, plant, manures samples (No.)	4115
10	Mobile agro-advisory to famers (Number of farmers)	211951



farmers. Special training programs on quality seed production in various crops; farmers' participatory seed production activities; distribution of quality seed, seed storage structures, crop protection equipment & small farm equipment; demonstrations, exhibitions, and exposure visits were conducted benefiting tribal farmers. 1166.165 quintals of quality

seed, production of livestock strains and fingerlings 9663 number distributed. Similarly, 1141 training programmes on various aspects of seed production, storage and quality enhancement, and 6761 demonstrations were also organized for the benefit of tribal farmers.

**Table 7.18 Centre wise activities conducted under Tribal Sub Plan (TSP)**

State	KVK	OFT (No. of farmers)	FLD (No. of farmers)	Farmers trained (No.)	Training of extension workers (No)	Participa nts in extension activities (No)	Seed product ion (q)	Planting material produc tion (No.)	Livestock strains etc. (No.)	Soil, water, plant, manures samples (No.)	Mobile agro - advisory to farmers (No.)
Maharashtra	Amravati-I	34	375	1813	58	4123	14.45	1000	21	553	4512
	Nandurbar	176	424	3213	281	7383	12.3	325140	5000	570	8400
	Nashik-I	70	809	1254	18	2804	0	3906	4	137	2346
	Palghar	87	287	5798	38	5409	37	21900	4560	625	12560
	Raigad	112	267	1273	135	2030	45	388	58	555	200
<b>Total</b>		<b>479</b>	<b>2162</b>	<b>13351</b>	<b>530</b>	<b>21749</b>	<b>108.75</b>	<b>352334</b>	<b>9643</b>	<b>2440</b>	<b>28018</b>
Gujarat	Bharuch	45	721	1914	18	7584	41.315	56807	0	542	3081
	Dahod	47	540	8418	140	33557	62.05	62512	0	0	19523
	Dangs	112	708	4343	160	24534	90.05	5020	0	184	3165
	Narmada	19	1326	5919	36	47005	268.36	122876	20	251	48474
	Tapi	41	466	5288	150	17886	369.63	216795	0	71	11113
	Valsad	100	838	2869	107	8173	226.01	94955	0	627	98577
<b>Total</b>		<b>364</b>	<b>4599</b>	<b>28751</b>	<b>611</b>	<b>138739</b>	<b>1057.415</b>	<b>558965</b>	<b>20</b>	<b>1675</b>	<b>183933</b>
<b>Grand Total (M+G)</b>		<b>843</b>	<b>6761</b>	<b>42102</b>	<b>1141</b>	<b>160488</b>	<b>1166.165</b>	<b>911299</b>	<b>9663</b>	<b>4115</b>	<b>211951</b>

## Skill Training

The skill development programme is an excellent step in helping young people become independent. Microbusinesses should be supported and the right skills should be developed. The agriculture Skill Council of India (ASCI) was founded to increase capacity in the agricultural sector, diversify the rural economy and ease pressure on agriculture and allied industries. Laboratories and farms will be connected through agro-based companies. To encourage the growth of entrepreneurship, ASCI plans to improve the skills of direct and indirect workers employed in organized and unorganized agriculture as well as in associated industries.

The main objectives of ASCI are i) End to end approach

to skilling and linking all the stakeholders of the agriculture value chain; ii) Creating more non-agricultural jobs; iii) Achieving rapid growth in the agriculture sector through intensive skill development; iv) Linking and generating a maximum number of entry-level jobs; v) Enhancing the economic value of time and labour of landless workforce; vi) Making farmers of the country agriculture entrepreneurs through market information; vii) Linking the farm labour with wage-related employment in the agriculture sector, during non-farming months.

Since 2016-17, ATARIs has been implementing the Ministry of Skill Development and Entrepreneurship's (MSDE) programme titled "Skill Training Through Krishi Vigyan Kendras" in KVKs, SAUs, and ICAR

institutes. Under this program, each center aims to host two skill training programmes, each lasting 200 hours, under the financial guidelines provided by

MSDE. KVKs conducted 32 skill-training programmes in 2021 that benefited 953 farmers and 169 farmers' women. The details are given in Table 7.19.

**Table 7.19 Number of farmers and farm women trained during 2021**

Sr.no	States	Number of skill development programmes	Total number of farmers trained	Number of Farm women trained
1	Maharashtra	22	445	69
2	Gujarat	10	508	100
<b>Total</b>		<b>32</b>	<b>953</b>	<b>169</b>



### DAMU under GKMS Scheme

The India Meteorological Department (IMD), Ministry of Earth Sciences and Indian Council of Agricultural Research (ICAR) have signed a Memorandum of Understanding (MoU) for establishing a weather observing system and development of Gramin Krishi Mausam Seva (GKMS) in the country through KVKs. DAMU receives weather forecasts from IMD to prepare and disseminate block-level agromet advisory bulletins. IMD is providing technical guidance to install and inspect the Automatic Weather Stations (AWS) at

KVKs. 21 KVKs (11 in Maharashtra, 9 in Gujarat, and 1 in Goa) were operating in 2021 under ICAR-ATARI Pune. Dissemination and coverage of AAS in various Agromet units are shown in Table 7.20. The 1377 WhatsApp groups that were created benefited 209703 farmers. There are 9442 communities included in the WhatsApp group's coverage. About 291 programmes are done to inform farmers about Agromet services, as shown in Table 7.21, which summarises the state of the Farmers Awareness Program. A total of 10903 farmers physically attended these programmes, and 818312 connected online.



**Table 7.20 Dissemination of AAS (Agromet Advisory Services)**

Sr.no	KVK	No. of WhatsApp Group created by DAMU KVK	No. of Farmers covered	No. of Villages covered	Total Number of Village
<b>Gujarat</b>					
1	Amreli	17	2356	423	616
2	Dahod	12	1726	353	723
3	Dang	6	1100	205	311
4	Jamnagar	15	1718	245	697
5	Narmada	11	1008	366	559
6	Panchmahal	8	723	99	1221
7	Surat	17	1705	206	723
8	Vadodara	28	2298	232	1563
9	Valsad	30	1200	212	466
<b>Maharashtra</b>					
1	Amravati II	83	16000	1537	1848
2	Aurangabad I	190	35000	982	1362
3	Bhandara	16	1873	221	771
4	Buldhana II	139	35118	327	1602
5	Gadchiroli	68	17496	578	1688
6	Nagpur I	178	13689	589	1617
7	Nandurbar	73	9842	673	931
8	Osmanabad	210	30338	343	629
9	Palghar	44	8563	618	1008
10	Solapur II	43	11090	691	1147
11	Washim	59	9860	347	734
<b>Goa</b>					
1	North Goa	130	7000	195	216
	<b>Grand total</b>	<b>1377</b>	<b>209703</b>	<b>9442</b>	<b>20432</b>

**Table 7.21 Status of FAP (Farmers Awareness Programme)**

Sr.No	Name of KVK	No of FAP	Farmers attended FAP	No. of Farmers connected through social media
<b>Gujarat</b>				
1	Amreli	20	255	2074
2	Dahod	11	607	12255
3	Dang	6	211	3800
4	Jamnagar	10	989	79641
5	Narmada	10	287	0
6	Panchmahal	15	1179	723
7	Surat	7	120	24406



Sr.No	Name of KVK	No of FAP	Farmers attended FAP	No. of Farmers connected through social media
8	Vadodara	22	598	70867
9	Valsad	46	927	16275
	<b>Total</b>	<b>147</b>	<b>5173</b>	<b>210041</b>
<b>Maharashtra</b>				
1	Amravati II	14	608	180000
2	Aurangabad I	6	209	133000
3	Bhandara	8	224	45140
4	Buldhana II	18	805	11156
5	Gadchiroli	11	400	37141
6	Nagpur I	12	581	175547
7	Nandurbar	12	432	727
8	Osmanabad	23	872	5269
9	Palghar	11	287	2026
10	Solapur II	11	518	2205
11	Washim	14	704	15660
	<b>Total</b>	<b>140</b>	<b>5640</b>	<b>1128760</b>
<b>Goa</b>				
1	North Goa	4	90	400
	<b>Grand total</b>	<b>291</b>	<b>10903</b>	<b>818312</b>

### Nutri-Sensitive Agricultural Resources and Innovations (NARI)

All 82 KVKs from Maharashtra, Gujarat and Goa are working towards nutri-sensitive agriculture. Awareness camps, training and exhibitions were organized for the farmers, farm women and Anganwadi workers. Nutrition gardens, Poshan Vatika and kitchen gardens have been developed at the KVK campus and in identified villages under KVK jurisdiction.

Under NARI On-Farm Trials, total 50 nutritional gardens were started in Maharashtra. Whereas 19 technologies were assessed for Biofortified crops benefiting 287 farmers from Maharashtra. 19 (16 from Maharashtra and 03 from Gujarat) number of technologies were assessed under value addition benefiting 280 farmers. 18 other enterprises on NARI were formed of which 17 were from Maharashtra and 01 from Gujarat, benefiting 191 farmers.

Under Field Level Demonstrations 2303 nutritional gardens were established in Maharashtra, 1062 in Gujarat and 05 in Goa. Biofortified crops were

demonstrated on 126.99 ha area benefiting 531 farmers of which 79.49 ha area was covered in Maharashtra and 47.50 ha area in Gujarat benefiting 294 and 237 farmers respectively. 46 value addition demos (32 in Maharashtra, 10 in Gujarat, and 04 in Goa) were organized in a zone benefitting 1172 farmers and farm women (641 from Maharashtra, 343 from Gujarat and 138 from Goa). 108 other enterprises on NARI were formed of which 83 were from Maharashtra and 25 from Gujarat, benefiting 735 farmers.

A total of 578 Training programmes benefiting 19937 farmers and 692 Extension Activities involving 40554 farmers were organized in the zone during the year. 410 Training programmes were organized in Maharashtra, 158 in Gujarat and 10 in Goa benefiting 14558, 5216 and 163 farmers respectively. Whereas 428 Extension Activities were organized in Maharashtra, 251 in Gujarat and 13 in Goa benefiting 29157, 11106 and 291 farmers respectively.

Rashtriya Mahila Diwas was also celebrated on 15 October for creating more awareness among farm women and children on Nutrition related aspects.

## Activities under NARI Programme

**Table 7.22 OFTs under NARI Programme**

Activity	Maharashtra		Gujarat		Goa		Total	
	No. of technologies assessed	No. of farmers	No. of technologies assessed	No. of farmers	No. of technologies assessed	No. of farmers	No. of technologies assessed	No. of farmers
Nutritional Garden	50	50	0	0	0	0	50	50
Bio-fortified Crops	19	287	0	0	0	0	19	287
Value addition (in no. of Unit or no. of Enterprise)	16	260	3	20	0	0	19	280
Other Enterprises (in no. of Unit or no. of Enterprise)	17	188	1	3	0	0	18	191

**Table 7.23 FLDs under NARI Programme**

Activity	Maharashtra		Gujarat		Goa		Total	
	Area (ha/ no. of Unit/ Enterprise)	No. of farmers/ beneficiaries	Area (ha/ no. of Unit/ Enterprise)	No. of farmers/ beneficiaries	Area (ha/ no. of Unit/ Enterprise)	No. of farmers/ beneficiaries	Area (ha/ no. of Unit/ Enterprise)	No. of farmers/ beneficiaries
Nutritional Garden	2303	3120	1062	2129	5	76	3370	5325
Bio-fortified Crops	79.49	294	47.5	237	0	0	126.99	531
Value addition (in no. of Unit or no. of Enterprise)	32	691	10	343	4	138	46	1172
Other Enterprises (in no. of Unit or no. of Enterprise)	83	412	25	323	0	0	108	735

**Table 7.24 Other Activities under NARI Programme**

Activity	Maharashtra		Gujarat		Goa		Total	
	Number of Programme	No. of farmers	Number of Programme	No. of farmers	Number of Programme	No. of farmers	Number of Programme	No. of farmers
Training Programmes	410	14558	158	5216	10	163	578	19937
Extension Activities	428	29157	251	11106	13	291	692	40554



### Capacity Building of Farmers through Training Programmes on Profitable Dairying Farming and Livestock Management

The project “Capacity Building of Farmers through Training Programmes on Profitable Dairy Farming and Livestock Management” of Ministry of Fisheries, Animal Husbandry and Dairying is implemented in 52 KVKs of ATARI Pune during the year 2022-23. Among 52 KVKs 30 are in Maharashtra, 20 in Gujarat and 2 in Goa. During the 3-day training Coordinator,

Scientist, and Animal Sciences, enlightened the participants about scientific management, feeding, disease management, vaccination, housing, breeding, and prevention and control of diseases in sheep and goats, and other related aspects. In the month of November-December 2021 KVKs conducted 42 training programmes with 1831 beneficiaries. KVKs in Maharashtra conducted 31 training with 1392 farmer beneficiaries and 11 training programmes were organised by KVKs in Gujarat with 439 beneficiaries. Details of participants are given in table below.



**Table No. 7.25 Details of Participants in training Programmes**

Sr. No	Name of State	No. of training completed	No. of Participants								
			SC/ST		OBC		Others		Total		Grand Total
			M	F	M	F	M	F	M	F	
1	Maharashtra	31	248	147	263	67	593	77	1101	291	1392
2	Gujarat	11	86	61	111	79	29	73	210	200	439
Total		42	334	208	374	146	622	150	1311	491	1831

### On-going projects & programmes

There are various on-going projects/ programmes implemented by ICAR-ATARI, Pune, through KVKs of Zone-VIII during 2021 are given in Table 7.26.


**Table 7.26: Nodal Officers of Ongoing projects & programmes at ICAR-ATARI, Pune during 2021**

Sr. No	Title of Projects & Programmes	Nodal Officer
1.	National Innovations on Climate Resilient Agriculture (NICRA)	Mr. T. R. Athare
2.	Attracting and Retaining Youth in Agriculture (ARYA)	Dr. Rajesh T
3.	Farmer FIRST Programme (FFP)	Dr. Rajesh T
4.	Mera Gaon Mera Gaurav (MGMG)	Dr. Rajesh T
5.	Cluster Frontline Demonstration on Oilseeds (CFLD-Oilseeds)	Mr. T. R. Athare
6.	Cluster Frontline Demonstration on Pulses (CFLD-Pulses)	Dr. Rajesh T
7.	New Extension Methodologies and Approaches (NEMA)	Mr. T. R. Athare
8.	Tribal Sub Plan (TSP)	Mr. T. R. Athare
9.	Pulses Seed Hub	Dr. Rajesh T
10.	District Agri-Metrological Units (DAMU)	Dr. Rajesh T
11.	Kisan Sarathi	Dr. Rajesh T
12.	Jal Shakti Abhiyan	Dr. Rajesh T
13.	Paramparagat Krishi Vikash Yojana/ Natural Farming	Dr. Rajesh T
14.	Training on Scientific Beekeeping under National Beekeeping and Honey Mission (NBHM)	Mr. T. R. Athare
15.	Collaborative project of Demonstrations on Nano urea by IFFCO	Dr. Rajesh T
16.	Convergence in sericulture extension training of Central Silk Board (CSB)	Dr. Rajesh T
17.	Nutrition-sensitive Agricultural Resources and Innovations (NARI)/ Nutrition Garden	Mr. T. R. Athare
18.	Capacity building of farmers on Profitable Dairy farming & Livestock management	Mr. T. R. Athare
19.	Microbial based agricultural waste management using vermicomposting	Mr. T. R. Athare
20.	Formation and Promotion of 10,000 FPOs by KVKs and ICAR Institutes as Cluster Based Business Organizations (CBBOs)	Dr. Rajesh T
21.	ARMS	Dr. Rajesh T
22.	Updating ATARI Website	Dr. Rajesh T
23.	Skill Development Programme (ASCI)	Mr. T. R. Athare
24.	DFI Success Stories	Mr. T. R. Athare
25.	Swachhta Abhiyan/ Swachhta Action Plan	Mr. T. R. Athare

# Special Programmes and SAC Meeting

## Chapter 8

In this section, special programmes are reported which were organized by the KVKs in the Zone. Several programmes like Poshan Maah, Jal Shakti Abhiyan, Celebration of World Soil Day, Rashtriya Mahila Diwas, Constitution Day etc. were organized with involvement of different stakeholders.



### Poshan Maah and Tree Plantation Campaign (September 2021)

Poshan Maah celebrated during 01.09.2021 to 30.09.2021 by all KVKs. A total of 11993 participants participated in Poshan Maah program, which includes 7334 farm women, 4360 adolescent girls and others.



**Table 8.1 Poshan Maah celebrated during 01.09.2021 to 30.09.2021**

State	Number of KVKs	VIPs	Girls	Farmers	Total participants	Plants planted/ distributed	Vegetable seed distributed
Maharashtra	44	192	2664	4512	7368	42699	5263
Gujarat	30	104	1654	2697	4455	36172	3371
Goa	2	3	42	125	170	291	162
<b>Total</b>	<b>76</b>	<b>299</b>	<b>4360</b>	<b>7334</b>	<b>11993</b>	<b>79162</b>	<b>8796</b>

### Jal Shakti Abhiyan

Jal Shakti Abhiyan (JSA) - A Water Conservation Campaign was launched by the Ministry of Jal Shakti, Government of India across the country from 1 July to 15 September 2019. Main objective of the JSA was for creating awareness among all stakeholders including farmers on water management and rainwater harvesting. There is need to shift its focus from land productivity to water productivity. A time bound

implementation and monitoring of JSA was ensured in their allotted districts at national level. In this period, several activities were organized by the KVKs with a total of 198 programmes and 41890 participants. Focus on water sharing among farmers – a tradition in dry land villages, innovative practices of rain water management, water budgeting at village level, forming water users associations was given. All were motivated by sharing statement 'we can achieve the power of Jal Shakti with the power of Jan Shakti'.

## Celebration of Cleanliness Drive Programme

Swachh Bharat Mission was launched throughout length and breadth of the country as a national movement. The campaign aims to achieve the vision of a 'Clean India'. The Swachh Bharat Abhiyan is the most significant cleanliness campaign by the Government of India. Swachh Bharat Abhiyan has become a 'Jan Andolan' receiving tremendous support from the people. Citizens too have turned out in large numbers and pledged for a neat and cleaner India. Taking the broom to sweep the streets, cleaning up the garbage, focusing on sanitation and maintaining a hygienic environment have become a practice after the launch of the Swachh Bharat Abhiyan. People have started to take part and are helping spread the message of 'Cleanliness is next to Godliness.'

All the KVKs under ICAR-ATARI Zone VIII, Pune celebrated the Swachhta Pakhwada during 16-31 December 2021 with active participation of 52953



people. In Maharashtra, 50 KVKs organized different activities with 28599 participants while in Gujarat 30 KVKs enrolled 22903 people in cleanliness drive and in Goa 2 KVKs involved 1433 participants. The Swachhta Campaign mainly included activities like Kisan Goshti, campaign, Awareness about Swachhta, Crop Residue Management, Swachhta Oath and Crop/solid waste management.

**Table 8.2 Swachhta Pakhwada Celebrated from 16-31 December, 2021**

State	Activities organized	No. of KVKs	Total No. of participants
Maharashtra	Taking Swachhata Pledge, Oath taking & briefing of the activities to be organized during the Pakhwada	50	28599
Gujarat	Oath taking and briefing of Swachhata pakhwada activity to staff and participants	30	22903
Goa	Swachhta Pledge & Tree Plantation, KVK campus cleaning	2	1433
<b>Total</b>		<b>82</b>	<b>52953</b>

## World Soil Day Celebration

Major attention was given for maintaining soil health for sustainable agriculture. Every year, World Soil Day is celebrated on 5<sup>th</sup> December for creating mass awareness among human beings. In this context, 82 KVKs across the Zone (50 Maharashtra, 30 Gujarat and 2 KVKs from Goa) celebrated World Soil Day programme on 5<sup>th</sup> December, 2021. In this programme, 6711 participants were benefitted and got aware about soil conservation and integrated nutrients management. KVKs under ICAR-ATARI, Zone VIII, Pune celebrated the "World Soil Day 2021" on 5<sup>th</sup> December, 2021 with total 6802 participants

among these 5390 were farmers, 980 number of students and 341 scientists. In Maharashtra, 48 KVKs organized the programme with 4526 participants while in Gujarat 30 KVKs saw participation of 2040 people and in Goa 2 KVKs involved 145 participants. Overall 91 VIPs from different field also contributed to the awareness programme. The soil day mainly included awareness about importance of soil test, soil health card, soil fertility etc. Some of the KVKs also distributed Soil Health Cards to farmers. Demonstration on scientific soil sampling were also conducted. The state-wise details of the events are reported in Table 8.3.





Table 8.3 Details of World Soil Day organized by the KVKs

Name of the State	No. of KVKs organized programme	No. of participants attended				No. of VIPs attended
		Farmers	Scientists	Students	Total	
Maharashtra	48	3785	189	552	4526	78
Gujarat	30	1502	124	414	2040	12
Goa	2	103	28	14	145	1
<b>Total</b>	<b>80</b>	<b>5390</b>	<b>341</b>	<b>980</b>	<b>6711</b>	<b>91</b>

### Celebration of Constitution Day

As a part of “Azadi Ka Amrit Mahotsav”, Krishi Vigyan Kendras of ICAR-ATARI, Pune (Zone-VIII) organized different programmes on the theme 'Agriculture and Environment: the Citizen Face' on 26<sup>th</sup> November, 2021. On this occasion, KVKs of Maharashtra have organized 82 orientation programmes and organized 49 exposure visits. Also they have conducted 41 debate/quiz/drawing competitions and 16 exhibitions in the state. In total, 188 different activities have been organized with 6765 participants under the programme in the state of Maharashtra. In Gujarat, 28 orientation programmes was organized for 1959 participants, 16 exposure visits to different demonstration plots with 801



participants, 15 debate/quiz/drawing competition organized for 593 participants and 2 exhibitions were conducted for 359 participants.

Table 8.4 Information on celebration of Constitution Day events on 26.11.2021 on Agriculture and Environment: The Citizen face

State	No. of KVKs	Orientation programme organized		Exposure visit organized		Debate/Quiz/Drawing competition organized		Exhibitions organized		Total	
		No. of activities	No. of participants	No. of activities	No. of participants	No. of activities	No. of participants	No. of activities	No. of participants	No. of activities	No. of participants
Maharashtra	43	82	4318	49	973	41	1079	16	395	188	6765
Gujarat	23	28	1959	16	801	15	593	2	359	61	3712
Goa	1	0	0	1	30	0	0	0	0	1	30
<b>Total</b>	<b>67</b>	<b>110</b>	<b>6277</b>	<b>66</b>	<b>1804</b>	<b>56</b>	<b>1672</b>	<b>18</b>	<b>754</b>	<b>250</b>	<b>10507</b>

## Rashtriya Mahila Kisan Diwas Celebration

Farm women were given more attention for their socio-economic empowerment. In this context, the Ministry of Agriculture and Farmers Welfare had decided to observe 15<sup>th</sup> October every year to celebrate as Rashtriya Mahila Kisan Diwas by all SAUs, ICAR institutes and KVKs. In the Zone, 82 KVKs celebrated "Rashtriya Mahila Kisan Diwas" programme on 15 October 2021 by organizing 98 different activities



with 4461 participants. Maharashtra State KVKs organized 61 activities with 2968 participants while Gujarat KVKs organized 36 activities with 1433 participants and Goa state organized one activity with 60 participants. The activities organized mainly included seminars, training programmes, goshtis, exhibitions on role of women in agriculture, women empowerment, nutrition and income generation.



## Parthenium Awareness Week During 16-22 August 2021

KVKs under ICAR-ATARI Zone VIII, Pune celebrated the "Parthenium Awareness Week" during 16-22 August 2021 by organizing 222 awareness programmes with 7633 participants. Maharashtra State KVKs organized 135 programmes with 4541 participants while Gujarat KVKs organized 86 programmes with 3080 participants. The awareness programmes mainly included Parthenium uprooting,

kisan goshti, group meetings, rallies, training programmes on eradication of Parthenium, integrated Parthenium management, composting of Parthenium and demonstration of herbicides. Along with the awareness programmes KVKs uprooted Parthenium weed from their campus and farms to make the KVK Parthenium free. At the adopted villages, KVKs organized rallies, training programmes and encouraged farmers and villagers to uproot congress grass from their surroundings and make their village Parthenium free.



**Table 8.5 Parthenium Awareness Week During 16-22 August 2021**

Sr. No.	State	No. of Programmes	No. of participants
1	Maharashtra	135	4541
2	Gujarat	86	3080
3	Goa	1	12
	<b>Total</b>	<b>222</b>	<b>7633</b>



## Fertilizer Awareness Program on 18 June 2021

KVKs under ICAR-ATARI Zone VIII, Pune celebrated the "Fertilizer Awareness" during 18 June, 2021 by

organizing 79 awareness programmes with 3154 participants. Maharashtra State KVKs organized 49 programmes with 2339 participants while Gujarat KVKs 49 organized 29 programmes with 854 participants.

**Table 8.6 Fertilizer Awareness Program on 18 June 2021**

SN	State	No. of KVKs	No. of Participants		Total No. Participants
			No. of VIP Attended	No. of farmers	
1.	Maharashtra	49	72	2167	2339
2.	Gujarat	29	4	850	854
3.	Goa	1	1	60	61
	<b>Total</b>	<b>79</b>	<b>77</b>	<b>3077</b>	<b>3154</b>

## Mera Gaon Mera Gaurav (MGMG) Scheme

Focus on promoting direct interface of scientists with the farmers is being given under innovative scheme Mera Gaon Mera Gaurav (MGMG). Lab to land process is being accelerated at ground level. Major objective of the scheme is to make more contacts with farmers and scientists, developing linkages with line departments, providing on-spot advisory on regular basis by adopting villages by the scientists. In the Zone, ICAR institutes and SAUs were actively involved under MGMG scheme. Under this scheme, at institute level many groups of multi-disciplinary

scientists were constituted. One group is consisted of 4-5 scientists and adopted 5 villages within a radius of 50-100 km from their place of working. In these adopted villages, different types of activities like field visits, trainings, frontline demonstrations, on farm trials, exhibitions etc. were organized. Extension literature was provided to the farmers. In all 142 groups of scientists in the zone (Maharashtra- 32 groups, Gujarat-110 groups) were constituted by 546 scientists. In total, 617 villages were adopted and 55159 farmers were benefitted through different activities. State-wise details are given in Table 8.7.

**Table 8.7 Number of teams of scientists formed, villages adopted and farmers oriented**

Sr. No.	State	No. of Teams	No. of Scientists	No. of villages	Farmers benefitted (No.)
1.	Maharashtra	32	136	106	13871
2.	Gujarat	110	410	511	41288
	<b>Total</b>	<b>142</b>	<b>546</b>	<b>617</b>	<b>55159</b>

## Kisan Mobile Advisory Services

Kisan Mobile Advisory Service is one of the Information and Communication Technology (ICT) tools for dissemination of need based information and knowledge at the right time to the needy farmers. KVKs are sending information through text and voice messages to the registered farmers regarding important agricultural operations, weather, market, events, programmes etc. Accordingly, KVKs advised farmers regularly on crops, livestock, other

enterprises, weather, marketing and awareness of latest agricultural technologies, events and programmes through personalized advisory. During the reporting period, 17654 text messages, 773 voice & text both and 194 voice messages were sent to 35.886 lakh farmers. Among these advisories, major share was of crops (5635) followed by livestock (4742), weather (4460), awareness (2361), other enterprises (772) and marketing (668). The information on mobile based advisories is presented in Table 8.8.



**Table 8.8 Kisan mobile advisory services and categories of messages sent to farmers**

State	No. of Registered farmers	Kisan Mobile Advisory Services							
		Message Type	Category of messages						
			Crop	Livestock	Weather	Marketing	Awareness	Other Enterprise	Total Messages
Maharashtra	3096375	Text Only	5267	4082	3694	348	2167	680	16238
Gujarat	424870	Text Only	259	600	363	26	136	62	1416
<b>Total</b>	<b>3521245</b>	<b>Text Only</b>	<b>5526</b>	<b>4682</b>	<b>4057</b>	<b>374</b>	<b>2303</b>	<b>742</b>	<b>17654</b>
Maharashtra	7015	Voice and Text both	45	10	360	12	14	15	456
Gujarat	56860	Voice and Text both	10	25	6	226	30	7	317
<b>Total</b>	<b>63875</b>	<b>Voice and Text both</b>	<b>55</b>	<b>35</b>	<b>366</b>	<b>238</b>	<b>44</b>	<b>22</b>	<b>773</b>
Gujarat	3500	Voice only	54	25	37	56	14	8	194
<b>Grand Total</b>	<b>3588620</b>		<b>5635</b>	<b>4742</b>	<b>4460</b>	<b>668</b>	<b>2361</b>	<b>772</b>	<b>18621</b>

### Soil, Water and Plant Analysis

Major focus is being given on soil test based application of nutrients in different crops. Mini soil testing kits are being used at each center. KVKs have also established soil, water and plant analyzing laboratory and analyzing soil, water and plant samples for the benefit of farming community. Further, KVKs are also utilizing this facility for carrying out the soil

test based nutrient recommendations for conducting FLDs and OFTs and providing advisory services on nutrient based recommendations to the farmers. In 2021, a total of 61018 samples of soils, 7522 samples of water, 735 samples of plants were analyzed by the KVKs in the zone. In total, 61913 Soil Health Cards were distributed among farmers with specific recommendation in local language. State-wise data on various parameters are given in Table 8.9.

**Table 8.9 Number of soil, water and plant analysis at KVKs**

State	SOIL, WATER and PLANT Analysis				No. of Soil Health Card Issued
	Samples	No. of Samples	No. of Farmers	Amount realized (Rs.)	
Maharashtra	Soil	51247	48349	8370983	52444
Gujarat	Soil	4864	4909	653425	4540
Goa	Soil	4907	4907	0	4929
<b>Total</b>	<b>Soil</b>	<b>61018</b>	<b>58165</b>	<b>9024408</b>	<b>61913</b>
Maharashtra	Water	6177	6036	730100	0
Gujarat	Water	1261	1289	60972	0
Goa	Water	84	84	0	0
<b>Total</b>	<b>Water</b>	<b>7522</b>	<b>7409</b>	<b>791072</b>	<b>0</b>
Maharashtra	Plant	563	291	277100	0
Gujarat	Plant	172	177	300	0
<b>Total</b>	<b>Plant</b>	<b>735</b>	<b>468</b>	<b>277400</b>	<b>0</b>
<b>Total Testing</b>		<b>69275</b>	<b>66042</b>	<b>10092880</b>	<b>61913</b>

Table - SAC Meetings of KVKs in 2021

Sr. No.	Maharashtra KVK	DATE	Sr. No.	Gujarat KVK	DATE
1.	Ahmednagar-II	29-12-2021	1.	Ahmedabad	09-08-2021
2.	Beed-I	22-06-2021	2.	Amreli	02-02-2021
3.	Beed-II	24-02-2021	3.	Anand	09-08-2021
4.	Bhandara	20-07-2021 07-12-2021	4.	Banaskantha-I	12-02-2021
5.	Buldhana-I	21.05. 2021	5.	Bharuch	12-01-2021
6.	Buldhana-II	29-07-2021 01-12-2021	6.	Bhavnagar	05-03-2021
7.	Chandrapur	19-07-2021 06-12-2021	7.	Dahod	10-08-2021
8.	Dhule	27-05-2021	8.	Jamnagar	08-02-2021
9.	Gadchiroli	19-07-2021 06-12-2021	9.	Junagadh	03-02-2021
10.	Gondia	20-07-2021 07-12-2021	10.	Kutch-I	30-12-2021
11.	Jalna-I	31-12-2021	11.	Mehsana	20-01-2021
12.	Jalna-II	12-03-2021	12.	Morbi	10-02-2021
13.	Kolhapur-I	20-12-2021	13.	Narmada	29-01-2021
14.	Nagpur-I	04-06-2021	14.	Patan	12-02-2021
15.	Nashik-II	31-10-2021	15.	Porbandar	17-02-2021
16.	Nandurbar	31-12-2021	16.	Rajkot-I	10-02-2021
17.	Osmanabad	17-03-2021	17.	Rajkot-II	10-02-2021
18.	Parbhani	26-02-2021	18.	Sabarkantha	26-03-2021
19.	Pune-I	06-07-2021	19.	Surendranagar	12-02-2021
20.	Raigad	06-07-2021	20.	Vadodara	20-01-2021
21.	Satara-II	25-05-2021			
22.	Solapur-I	24-09-2021			
23.	Solapur-II	28-05-2021			
24.	Wardha	26-07-2021 08-12-2021			
25.	Washim	15-11-2021			
26.	Yavatmal-I	26-07-2021 08-12-2021			
27.	Yavatmal-II	25-11-2021			

Scientific Advisory Committee meetings were conducted by KVKs to get advice and feedback on the mandated activities of KVK in planned and systematic manner by the participating members from ICAR institutions, ATARI, line department, farmers etc. The Committee monitors progress and facilitate exchange of views on the specific tasks. The

Committee reviews periodically and takes further course of action deemed fit for further validation on application by the KVK. Therefore, all KVKs were mandated to conduct the meetings on the periodical basis (twice in a year). Total 54 SAC meetings were conducted during 2021 in a 47 KVKs.

# HRD, Publications and Linkages

## Chapter 9

### Workshops/Conferences/Trainings Organized

- 'Orientation Training for Newly Recruited SMSs of KVKs in Maharashtra, Gujarat and Goa' organized jointly by ICAR-ATARI, Pune and AAU, Anand during 3-5 May, 2021.
- ICAR-CRIDA, Hyderabad in collaboration with ICAR-ATARI, Pune organized 'Review Workshop of NICRA-KVKs' in virtual mode on 15 May, 2021.
- Webinar on 'Strengthening Community Based Organizations through KVKs' jointly organized by ICAR-ATARI, Pune with MCDC, Pune on 3 June, 2021.
- 5 days 'Orientation Training cum Workshop for Newly Joined SRFs' organized at ICAR-ATARI, Pune from 29 June to 3 July, 2021.
- 'Online Annual Zonal Review Workshop of DAMU KVKs' on 29 July, 2021.
- 'Virtual Annual Zonal Workshop of KVKs of Maharashtra, Gujarat and Goa' during 4 to 6 August, 2021.
- 'Review cum Sensitization Workshop on CFLD on Oilseeds and Pulses' organized at KVK, North Goa during 18-19 November, 2021.

### Organized Meetings

- 'Interaction Meet on Impact Assessment' organized at ICAR-ATARI, Pune on 31 March, 2021.
- Meeting with NCDC Regional Director, Pune regarding FPOs on 14 September, 2021.
- Organized "Status and Review meeting of DFI success stories" on 18 October, 2021 at ICAR-ATARI, Pune.
- 'Review meeting of activities related to Kisan Sarathi' organized virtually by ICAR-ATARI, Pune on 8 November, 2021.

### Activities at ATARI Pune

- Celebrated International Yoga Day at ICAR-ATARI Pune on 21<sup>st</sup> June, 2021.
- Celebrated Hindi Diwas on 14<sup>th</sup> September, 2021 and Hindi Pakhwada from 14-29 September, 2021 at ATARI Pune.
- Vigilance Awareness Week at ATARI Office from 26<sup>th</sup> October to 01<sup>st</sup> Nov 2021.
- Celebration of Constitution Day at ICAR-ATARI Office on 26<sup>th</sup> November, 2021.
- Rajbhasha Hindi Nirikshan Committee visited ICAR-ATARI, Pune on 30<sup>th</sup> December, 2021.

### Attended Workshops/ Conferences

- 'Sensitization Workshop on DFI Network Project' in virtual mode, organized by ICAR-ATARI, Jodhpur on 22 April, 2021.
- Brainstorming Session on 'Gender and Nutrition Based Extension in Agriculture' under chairmanship of Dr. A.K. Singh, DDG (Agril Extension), ICAR on June 28, 2021 through virtual mode.
- Inaugural function of Zonal workshop of ICAR-ATARI, Jodhpur on 1 July, 2021.
- Online Directors' Conference under chairmanship of Secretary, DARE & DG, ICAR on 2 July, 2021 with all the Directors of ICAR Institutes.
- Inaugural function of Zonal Workshop of ICAR-ATARI, Kolkata on 6 July, 2021.



- Inaugural function of Zonal Workshop of ICAR-ATARI, Hyderabad on 6 July, 2021.
- Attended Zonal Workshop of ICAR-ATARI, Bengaluru on 30 July, 2021.
- Interaction workshop on Gender and Nutrition Network Project on 3 August, 2021 in virtual mode.
- Session on '*Organic farming in Maharashtra: challenges & Opportunities*' at ICAR-NRCG, Pune on 8 September, 2021.
- '*Knowledge Sharing Workshop on Natural Farming*' organized by NITI Aayog on 30 November, 2021.
- Triannual conference on Millets organized by Bharatiya Kisan Sangh at Sangli on 4 December, 2021.

### Participation in Trainings/Meetings/Visits/Interactions by ATARI Officials

- Participated in Pre-Regional committee meeting (Zone-VII) on virtual Mode on 12 March, 2021.
- Attended Virtual Water Day Celebration organized by ICAR, New Delhi on 22 March, 2021.
- Attended meeting on Doubling Farmers Income on 30 March, 2021.
- National Webinar on Bhumi Suposhan under Guidance of Shri Parshottam Rupala, MOS, Govt of India, Secretary, DARE & DG, ICAR and DDG (Agril Extension) on 15 April, 2021.
- Beekeeping Training organized by KVK Washim on 15 April, 2021.
- Participated in Launch of virtual classroom and Agri Disha channel under chairmanship of Secretary, DARE & DG, ICAR, New Delhi on 16 April, 2021.
- Chief Guest at '*Training program on Pomegranate Production Technology*' at KVK Aurangabad-I on virtual mode on 21 April, 2021.
- Chief Guest during '*Scientific bee keeping training*' organized by KVK Vadodara on 4 May, 2021.
- Chief Guest during '*Sweet Orange Training*' organized by KVK Jalna-II on 6 May, 2021.
- Attended '*Kharif Shetkari Mela*' organized by KVK Osmanabad on 11 May, 2021.
- Attended Regional Committee Meeting in virtual mode on 13 May, 2021.
- Chief Guest in online Kharif Shetkari Melava on event of University foundation Day, organized by VNMKV Parbhani on 18 May, 2021.
- Chief Guest in '*Online 5-Days Fruit and Vegetable and Processing Chain training*' organized by KVK Dhule on 19 May, 2021.
- Chief Guest in Online Farmers Training organized by KVK, Nagpur-I during 24 May, 2021.
- Chief Guest in Inaugural Session of '*Vocational Training on Millets Processing and Value Addition*' organized by KVK Jalna-I on 26 May, 2021.
- Review meeting of network projects under chairmanship of DDG (Agril Extension) on 3 June, 2021.
- Interface meeting on Contingency planning and Preparedness for kharif season in Maharashtra on 8 June, 2021 with Commissioner Agriculture, NICRA KVKs, Director of ICAR institutes, CRIDA Hyderabad and line department officials.
- Virtual Interface Meeting on CBBOs organized by NCDC, New Delhi on 9 June, 2021.
- Virtually attended Kharif Shetkari Melawa organized by KVK Yavatmal-I on 12 June, 2021.
- Interface meeting on enhancing the preparedness for Agricultural Contingencies during 2021, organized by ICAR-CRIDA, Hyderabad and Department of Agriculture, Govt of Gujarat on 17 June, 2021.
- Attended the meeting on 'ARYA Project' on 29 June, 2021.
- Online review meeting of progress of implementation of CSS Formation and Promotion of 10,000 FPOs by Dr. C. Roul, Sr. Adviser, NCDC, Dr. A. K Singh, DDG (Agril Extension), ICAR and Chief Director (FPO), NCDC on 15 July, 2021.
- Interaction with Padma Shree Awardee Farmers on 16 July, 2021 along with Secretary, DARE & DG, ICAR, New Delhi.
- Kisan Sarathi Hands on Training for Maharashtra KVKs on 24 July, 2021 organized by IASRI, New Delhi.

- Inaugural function of Annual Zonal Workshop at ICAR-ATARI, Jabalpur on 26 July, 2021.
- NCDC FPOs review meeting on virtual mode on 30 July, 2021.
- Virtually attended the inauguration of '10 Days training program on Organic farming to sustainable development' organized by KVK Jalna-II on 10 August, 2021.
- Conducted Interaction meeting of 'ARYA Network Project' to finalize the Google Form for data collection on 16 August, 2021.
- Inaugurated 'Online Training on Scientific Cultivation of Turmeric' organized by KVK-Washim on 21 August, 2021.
- Attended Meeting on Doubling Farmers' Income (DFI) Project organized by ICAR-ATARI, Jodhpur on 21 August, 2021.
- Attended Regional Committee meeting on 25 August, 2021 in virtual mode.
- DAMU Project orientation programme on "Preparation and dissemination of Agro met Advisories at Block level under Gramin Krishi Mausam Seva (GKMS) scheme" for Nodal Officers of Krishi Vigyan Kendras (KVKs) on 26 August, 2021.
- Attended the meeting to Review the Progress and Implementation of Central Sector Scheme for Formation and Promotion of 10,000 FPOs on 1 September, 2021.
- Attended Interface meeting under chairmanship of VC, MPKV, Rahuri along with farmers, line Department, SAU officials regarding effective implementation of Farmer FIRST Program on 16 September, 2021.
- Meeting under the Chairmanship of DGM, IMD to discuss various issues related to DAMUs established under GKMS on 20 September, 2021.
- Guest of Honor during Foundation Day Celebration of NRCP, Solapur on 25 September, 2021.
- Committee Member for selection of new NTI Presentation (Online Platform) under Agri-Clinics and Agri-Business Centre's Scheme by MANAGE, Hyderabad on 5 October, 2021.
- Chief Guest during Celebration of World Eggs Day organized by MAFSU, Nagpur on 8 October, 2021 in virtual mode.
- Virtual Review Meeting of Pulses Seed Hub and EBSP under Chairmanship of DDG (CS), ICAR, Agril Commissioner, Govt of India and Joint Sec. (Crops), ADG (O&P) and ADG (Seed) on 14 October, 2021
- Meeting with DDG (Agri Extension), ICAR, New Delhi regarding Swachhta Abhiyan on 21 October, 2021.
- Meeting on Gramin Mosam Seva Information agro advisory on DAMU Project organized by IMD on 21 October, 2021.
- Interaction meeting with Assistant Director (Technical), Food Safety and Standards Authority of India (Ministry of Health & family Welfare Government of India) on 22 October, 2021.
- Inauguration of Training Programme "Producer Organization Promoting Institution (POPIs) Residential Training Programme" organized by Maharashtra Cooperative Development Corporation Ltd., Pune on 26 October, 2021.
- Online Review Meeting on '*Special Campaign on Swachhta and Pending matters*' under chairmanship of Hon'ble Agriculture Minister (Shri Narendra Singh Tomar) on 27 October, 2021.
- Attended meeting on "Interaction of Secretary, DARE and DG, ICAR with all ICAR Scientists" on 28 October, 2021.
- Virtual meeting on Development of Collaborative Framework for Cattle Improvement under SCSP/ TSP with ATARIs under the Chairmanship of DDG (Agril Extension) on 9 November, 2021.
- Review meeting of Network projects under the Chairmanship of DDG (Agril Extension) on 22 November, 2021.
- Attended Inaugural function of administrative building of ICAR-ATARI, Patna by Shri. Narendra Singh Tomar, Union Minister of Agriculture & Farmers' Welfare, Govt. of India on 23 November, 2021.
- Participated in Webinar on National Milk Day under guidance of Hon'ble DG, DDGs, ICAR and Director, NDRI on 26 November, 2021.
- Review meeting of Kisan Sarathi under the chairmanship of DDG (Agril. Extension) on 3 December, 2021.
- Attended meeting on "Interaction of Secretary,

DARE & DG, ICAR with Young Scientists of ICAR" on 8 December, 2021.

- Virtual Conclave on Natural Farming organized by Amul, Anand, addressed by Hon'ble Prime

Minister, Minister, Agriculture and Farmers Welfare, Govt of India on 16 December, 2021.

- Inaugural program of administrative building and farmer's hostel of KVK Ahmednagar-II on 29 December, 2021.

### KVK and Field Visits by Officials, ATARI, Pune

- Visited and reviewed the activities of KVK Palghar on 5 March, 2021.
- Visited KVK Bhandara on 27 August, 2021 and interacted with KVK staff.
- Visited instructional farm and reviewed progress of KVK Yavatmal-I on 28 August, 2021.
- Visited instructional farm of KVK Yavatmal-II and discussed various issues with Chairman of KVK and all the staff on 29<sup>th</sup> August, 2021.
- Visited instructional farm of KVK Nagpur-I and reviewed progress of KVK on 29 August, 2021.
- Visited KVK Pune-II and field activities in Junnar taluka on 11 September, 2021.
- Visited field activities under farmer FIRST program (FFP), MPKV, Rahuri and interacted with farmers' on 16 September, 2021.
- Visited and reviewed the activities of KVK Solapur-II on 24 September, 2021.
- Visited and reviewed the activities of KVK Nashik-I on 19 October, 2021.
- Visited KVK Sangli-I and other field activities like CFLD plots and Instructional farm on 4 December, 2021.
- Visited KVK Ahmednagar-II on 29 December 2021.

### Interview Conducted at KVKs

- Conducted online interview for the posts of YP-I (IT) and YP-I (F&A) at ICAR-ATARI, Pune on 29 May, 2021.
- Conducted online interview for the posts of SRF under NEMA, NICRA, ARYA, Farmer FIRST and CFLD Oilseed and CFLD Pluses Project at ICAR-ATARI Pune during 14-15 June, 2021.
- Conducted interview for the post of Farm Manager, Program Assistant (Computer), Program Assistant (Soil Science) at KVK Yavatmal-II on 28 August, 2021
- Conducted Interview for the post of Senior Scientist and Head at KVK Pune-I on 31 August, 2021.

### SAC Meetings Attended

- KVK Jalna-I (12.03.2021), KVK Osmanabad (17.05.2021), KVK Jalgaon-II (17.05.2021), KVK Dhule (27.05.2021), KVK Beed-I (22.06.2021), KVK Pune-I (06.07.2021), KVK Wardha (26.07.2021), KVK Yavatmal-I (26.07.2021), KVK Solapur-I (24.09.2021), KVK Nashik-II (31.10.2021), KVK Yavatmal-II (25.11.2021), KVK Yavatmal-I (08.12.2021), KVK Ahmednagar-II (29.12.2021), KVK Jalna-I (31.12.2021), KVK Nandurbar (31.12.2021).

### Awards and Recognition

- National Award for Excellence in Agricultural Research - ICAR Award (Vasant Naik Award for Outstanding Research and Application in Dry land Farming System - 2021) awarded to ICAR ATARI, Pune and KVK Kutch-I.
- Swachhta Pakwada Award 2021 awarded to ICAR-ATARI, Pune.



# Status of Budget and Staff

## Chapter 10

### Status of Budget

During the financial year 2021-22, an amount of Rs. 16501.03 lakh was utilized / released against the allotted budget of Rs. 16501.70 lakh. Head-wise details of budget and expenditure are furnished in Table 10.1

**Table 10.1 Head-wise budget and expenditure of Zone VIII for 2021-22**

(Rs. in Lakh)

Heads	RE 2021-22				Expenditure			
	ATARI	KVKs	Support to DEEs	Total	ATARI	KVKs	Support to DEEs	Total
<b>A) Recurring</b>								
Pay & Allowance	52.34	14909.10	0.00	14961.44	52.02	14909.10	0.00	14961.12
Contingencies	35.66	828.60	6.00	870.26	35.31	828.60	6.00	869.91
HRD	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>88.00</b>	<b>15737.70</b>	<b>6.00</b>	<b>15831.70</b>	<b>87.33</b>	<b>15737.70</b>	<b>6.00</b>	<b>15831.03</b>
<b>B) Non -Recurring</b>								
Works	200.00	371.05	0.00	571.05	200.00	371.05	0.00	571.05
Furniture, IT & Equipment	54.95	44.00	0.00	98.95	54.95	44.00	0.00	98.95
Vehicle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>254.95</b>	<b>415.05</b>	<b>0.00</b>	<b>670.00</b>	<b>254.95</b>	<b>415.05</b>	<b>0.00</b>	<b>670.00</b>
<b>Grand Total (A+B)</b>	<b>342.95</b>	<b>16152.75</b>	<b>6.00</b>	<b>16501.70</b>	<b>342.28</b>	<b>16152.75</b>	<b>6.00</b>	<b>16501.03</b>

### ICAR-ATARI Staff

#### Research Management Position

1. Dr. Lakhan Singh, Director

#### Scientific Staff

1. Mr. Tushar Athare, Scientist (Agril Extension)
2. Dr. Rajesh T, Scientist (Agril Economics)

#### Administrative Staff

1. Shri R B Rai, Assistant Administrative Officer on additional duty from ICAR-NRCP, Solapur
2. Shri Munish Narayan Ganti, Finance & Accounts Officer on additional duty from ICAR-NRCG, Pune



भाकृअनुप-कृषि प्रौद्योगिकी अनुप्रयोग अनुसंधान संस्थान

जोन-VIII, पुणे-411005, महाराष्ट्र

**ICAR-Agricultural Technology Application Research Institute**  
Zone-VIII, Pune-411005, Maharashtra