



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

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**वार्षिक प्रतिवेदन**  
**Annual Report**  
**2014-15**



भा.कृ.अ.प- क्षेत्रीय परियोजना निदेशालय - क्षेत्र ८  
भारतीय कृषि अनुसंधान परिषद  
बेंगलूर - 560 024

**ICAR-Zonal Project Directorate - Zone VIII**  
**Indian Council of Agricultural Research**  
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**Dr. Sreenath Dixit**

Zonal Project Director  
ZPD-Zone VIII,  
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## Preface

Zone VIII under the Agricultural Extension Division of ICAR is responsible for the KVKs located in the States of Karnataka, Kerala, Tamil Nadu, Goa and the Union Territories of Puducherry and Lakshadweep. There are 81 KVKs located across these States and Union Territories that are providing frontline extension services to the research stations located in this region. The KVK, as the district level farm science centre, has evolved over time and has attained an important position in the overall development of the agriculture and allied sectors.

KVKs could assess and demonstrate the technologies that could help farmers earn increased returns from their farms. Many KVKs of the Zone have been adopting innovative strategies to help farmers. In order to recognize such efforts, the ICAR has instituted awards at Zonal as well as National levels. During the year, KVK Bidar was adjudged as the Best KVK at the Zonal Level by demonstrating its leadership in the district. The KVK Namakkal was recognized as the best KVK implementing NICRA programme. I congratulate the KVKs and the staff who helped in attaining the distinction.

This Directorate is constantly engaged with the host organizations of KVKs, Programme Coordinators, Directors of Extension of State Agricultural Universities and the farmers at large to bring about improvement in not only the technology related aspects but also on innovative institutional mechanisms that would significantly contribute to technology uptake. The Directorate takes pride in the fact that it has been sanctioned with a research project “Behavioural Analysis of Farmers Decision Making on Agricultural Innovations” under the National Fund for Basic, Strategic and Frontier Application Research in Agriculture (NFBSFARA), ICAR.

This report summarizes the activities of KVKs and the ZPD, Zone VIII during the year 2014-15. It will serve as a reference material for data and information. I hope the report will be of interest and use to different stakeholders of the KVK system.

Place : Bengaluru

Date : July 10, 2015

**(Sreenath Dixit)**



भारत  
ICAR



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## कार्यकारी सारांश

भारतीय कृषि अनुसंधान परिषद ने भाकृअनुप संस्थान, राज्यकृषि विश्व विद्यालय, गैर-सरकारी संगठन, स्वशासी विश्वविद्यालय, एवं राज्य कृषि विभाग जैसे विभिन्न संगठनों के अधीन राज्य स्तर पर कृषि विज्ञान केन्द्रों का नेटवर्क स्थापित किया है। देश में 31 माच, 2015 तक 642 कृषि विज्ञान केन्द्रों की स्थापना की गई है, जिनमें से 81 कृषि विज्ञान केन्द्र, क्षेत्र-VIII में हैं। क्षेत्रीय परियोजना निदेशालय-क्षेत्र VIII कर्नाटक (31), तमिल नाडू (30), केरल (14), पुदुच्चेरी (3), गोवा (2) एवं लक्षद्वीप (1) के 81 कृषि विज्ञान केन्द्रों के प्रौद्योगिकीय अंतःक्षेप एवं अग्रिम-पंक्ति विस्तार कार्यक्रमों का समन्वयन, योजना-तैयारी, निगरानी एवं मूल्यांकन करता है।

कृषि विज्ञान केन्द्र किसानों एवं अन्य साझेदारों की सहभागिता से राज्य कृषि विश्वविद्यालयों और भारतीय कृषि अनुसंधान परिषद के संस्थानों की प्रौद्योगिकियों की मदद से प्रौद्योगिकियों का मूल्यांकन, परिष्करण एवं प्रदर्शन का कार्य करते हैं। कृषि विज्ञान केन्द्र अपने साझेदारों के लिए आवश्यकता-आधारित क्षमता-विकास कार्यक्रम आयोजित करते हैं तथा उचित अग्रिम पंक्ति विस्तार कार्यक्रम के माध्यम से उन्नत कृषि प्रौद्योगिकियों के बारे में जागरूकता पैदा करते हैं। प्रौद्योगिकियों के बारे में प्रारंभिक समझ के लिए गुणवत्तायुक्त बीजों, रोपण-सामग्रियों, पशु-धन नस्लों, पशु-उत्पादों एवं जैव-उत्पादों का उत्पादन एवं वितरण का कार्य किया जाता है। इस प्रकार कृषि विज्ञान केन्द्र जिले की कृषि-अर्थव्यवस्था को सुधारने के लिए सरकारी, निजी एवं स्वैच्छि क्षेत्रों द्वारा ली जा रही पहल को समर्थन देने के लिए कृषि-प्रौद्योगिकी के ज्ञान एवं संसाधन केन्द्रों के रूप में कार्य करते हैं। वर्ष (2014-15) के दौरान प्राप्त की गई महत्वपूर्ण उपलब्धियाँ निम्नलिखित हैं :

### 1. प्रौद्योगिकी का मूल्यांकन एवं परिष्करण

- कृषि विज्ञान केन्द्रों द्वारा 2021 प्रक्षेत्र-परीक्षण के माध्यम से 371 स्थानों पर 350 प्रौद्योगिकियों का मूल्यांकन तथा सात प्रौद्योगिकियों का परिष्करण किया गया। इनमें से 91.95% फसलों के अंतर्गत तथा शेष पशु-धन, कुक्कुट, मात्स्यिकी एवं अन्य क्षेत्रों के अंतर्गत था।
- फसलों के अंतर्गत 315 प्रौद्योगिकियों का मूल्यांकन किया गया, जिनमें किस्मवार मूल्यांकन (125), समेकित फसल-प्रबंधन (42), समेकित पोषण-प्रबंधन (32), समेकित रोग-प्रबंधन (31), समेकित नाशीजीव-प्रबंधन (30), फसल-प्रणाली (13) और समेकित नाशीजीव व रोग-प्रबंधन (13) शामिल हैं।
- पशु-पालन के अंतर्गत कुल 20 प्रौद्योगिकियों का मूल्यांकन किया गया, जिनमें से 10 उत्पादन व प्रबंधन से संबंधित थीं, 5 पोषण-प्रबंधन, 3 नस्लों के मूल्यांकन और 2 रोग-प्रबंधन से

संबंधित थीं।

- धान की गंगावती किस्म ने खारी मिट्टियों में अच्छी पैदावार दी, जो माण्ड्या जिले में 56 किं./हे. थी, जिसका लाभ-लागत अनुपात 2.40 था।
- धान की एडीटी49 और सांभा मसूरी किस्में तमिल नाडू में बैक्टीरियाई पर्ण-अंगमारी रोग के प्रति सहनशील थीं। इनकी पैदावार 36 किं./हे. थी, जिसका लाभ-लागत अनुपात क्रमशः 1.29 एवं 1.22 था।
- मिट्टी में ट्राइकोडर्मा एवं स्फूडोमोनास के प्रयोग, 0.25% मेन्कोजेब एवं फेनामिडॉन+मेन्कोजेब 0.3% के छिड़काव से आलू में बेहतर पैदावार प्राप्त हुई तथा अगेती अंगमारी रोग के प्रकोप में कमी पाई गई।

### 2. फ्रण्टलाइन प्रदर्शन

- आयोजित किए गए कुल 9068 फ्रण्टलाइन प्रदर्शनों में अनाजों पर 1359, बाजरा पर 486, तिलहनों पर 444, दलहनों पर 540, वाणिज्यिक फसलों पर 189, चारा फसलों पर 285, सब्जी फसलों पर 790, कन्द फसलों पर 124, फल फसलों पर 743, पुष्प एवं सुगंधित फसलों पर 1863, मसाला फसलों पर 399 तथा रोपण फसलों पर 145 शामिल थे।
- उपयुक्तों के अलावा कर्नाटक, तमिलनाडू, केरल, गोवा एवं संघ राज्य क्षेत्र पुदुच्चेरी में कुल 2388.17 हेक्टेयर क्षेत्रों में विभिन्न फसलों की संक किस्मों पर 849, एनएफएसएम जिलों में 419 विशेष दलहन प्रदर्शन, प्रक्षेत्र यंत्रों पर 121, पशु-धन एवं मात्स्यिकी पर 1359 तथा उद्यम पर 791 प्रदर्शन आयोजित किए गए।

### 3. क्षमता-विकास

- रिपोर्टाधीन वर्ष के दौरान 202619 व्यक्तियों के लिए 5471 प्रशिक्षण कार्यक्रम आयोजित किए गए। अधिकांश प्रशिक्षण कार्यक्रम किसानों/कृषक महिलाओं के लिए थे, जिनमें 1.54 लाख से अधिक किसानों/कृषक महिलाओं को प्रशिक्षण दिया गया। किसानों/कृषक महिलाओं को दिए गए प्रशिक्षण के मुख्य विषय फसल-उत्पादन (1101 पाठ्यक्रम), पौध-संरक्षण (688 पाठ्यक्रम), गृह विज्ञान/महिला सशक्तिकरण (563 पाठ्यक्रम), पशुधन-विकास एवं प्रबंधन (477 पाठ्यक्रम), मृदा स्वास्थ्य एवं उर्वरता प्रबंधन (340 पाठ्यक्रम) और सब्जी फसल (286 पाठ्यक्रम) थे। ग्रामीण युवा वर्गों को दिए गए प्रशिक्षण (552 पाठ्यक्रम, 18680 प्रतिभागी) पाठ्यक्रम में समेकित कृषि



(65 पाठ्यक्रम), खुम्ब-उत्पादन (61 पाठ्यक्रम), बागवानी फसलों का नर्सरी प्रबंधन (48 पाठ्यक्रम), मधुमक्खी-पालन (28 पाठ्यक्रम) और रोपण-सामग्रियों का उत्पादन (24 पाठ्यक्रम) शामिल थे। 11255 विस्तार कार्यकर्ताओं के लिए कुल 333 प्रशिक्षण चलाए गए। विस्तार कार्यकर्ताओं के लिए आयोजित विभिन्न विषयों में मैदानी फसलों की उत्पादकता में बढ़ोत्तरी (96 पाठ्यक्रम और 3200 प्रतिभागी) और समेकित नाशीजीव-प्रबंधन (46 पाठ्यक्रम और 1287 प्रतिभागी) मुख्य विषय थे।

- कृषि विज्ञान केन्द्र ने 13466 प्रतिभागियों के लिए 13 विभिन्न विषयों में 328 प्रायोजित प्रशिक्षण कार्यक्रम आयोजित किए। प्रशिक्षण के मुख्य विषय फसलों के उत्पादन एवं उत्पादकता में बढ़ोत्तरी (169) और मृदा-स्वास्थ्य एवं उर्वरता-प्रबंधन (38) थे। इसके अतिरिक्त उक्त वर्ष के दौरान 131 व्यावसायिक प्रशिक्षण कार्यक्रम भी आयोजित किए गए, जिनमें 4555 प्रतिभागियों ने भाग लिया, जिनमें अधिकांश ग्रामीण युवक-युवतियाँ थे। प्रशिक्षण के मुख्य विषय मूल्य-संवर्धन (31 पाठ्यक्रम), समेकित फसल-प्रबंधन (18 पाठ्यक्रम) और खुम्ब-उत्पादन (9 पाठ्यक्रम) थे।

#### 4. फ्रण्टलाइन विस्तार कार्यक्रम

- कृषि विज्ञान केन्द्र ने कृषि एवं संबद्ध क्षेत्रों के विभिन्न पहलुओं, जैसे किस्मवार निष्पादन, उत्पादन-तकनीकियाँ, समेकित नाशीजीव एवं रोग प्रबंधन, पशु-स्वास्थ्य एवं पोषण, कुक्कुट की उत्पादन-तकनीकी और मात्स्यिकी एवं मानव-पोषण आदि, पर 1.15 लाख विस्तार कार्यक्रम आयोजित किए, जिनमें 35.23 लाख किसानों एवं 1.40 लाख विस्तार कार्यकर्ताओं ने भाग लिया। इस वर्ष के दौरान कृषि विज्ञान केन्द्रों ने समाचार पत्रों में समाचार (1980), विस्तार साहित्य (1018), लोकप्रिय लेख (601), रेडियो वार्ता (444), टेलिविज़न वार्ता (340), शोध पत्र (200), न्यूजलेटर (165), तकनीकी बुलेटिन (95) और पुस्तकों/पुस्तकों में अध्याय (50) के प्रकाशन के माध्यम से संगत तकनीकियों का प्रचार-प्रसार किया। इसके अतिरिक्त कृषि विज्ञान केन्द्रों ने विभिन्न तकनीकियों पर 302 वीडियो सीडी/डीवीडी बनाई और इन्हें किसानों एवं अन्य साझेदारों के लिए विक्रय हेतु उपलब्ध करवाया।

#### 5. उत्पादन-तकनीकी

- कृषि विज्ञान केन्द्रों ने विभिन्न फसलों की किस्मों के 486.23 टन बीजों, विभिन्न फसलों एवं संकरों की 34.50 रोपण-सामग्रियों, 2018 लाख पशुधन नस्लों, छोटी मछलियों एवं अन्य जैव-उत्पादों को विकसित किया और 2.91 लाख किसानों को

वितरित किया।

- कृषि विज्ञान केन्द्रों ने 1194.85 टन जैविक उत्पादों, 49000 ईपीएन, 24327 फेरामोन जालों, 5600 एसेरोफेगस पपाया (पपीते की मीली बग परजीवि) एवं 727 ट्राइको कार्डों का उत्पादन एवं वितरण किया, जिसके माध्यम से 66547 किसानों को कीट-प्रबंधन के लिए रासायनों के उपयोग को कम करते हुए जैव-नियंत्रण विधियों को अपनाने के लिए प्रेरित किया गया।

#### 6. मृदा, जल एवं पौध-परीक्षण विश्लेषण

- इस क्षेत्र के किसानों को विश्लेषण संबंधी सेवाएँ प्रदान करने के लिए 67 कृषि विज्ञान केन्द्रों में मृदा, जल एवं पौध-परीक्षण के लिए प्रयोगशालाओं की स्थापना की गई। इस वर्ष के दौरान 20876 गाँवों के 36117 किसानों से प्राप्त मृदा, जल, पौध, खाद एवं पर्ण-ऊतक के 41538 नमूनों का विश्लेषण किया गया, जिससे 34.32 लाख की आय प्राप्त हुई। राज्य-वार आँकड़े दर्शाते हैं कि कर्नाटक, केरल, तमिलनाडू, गोवा और पुदुच्चेरी के कृषि विज्ञान केन्द्रों क्रमशः 24751,8524, 7700, 289 और 274 नमूनों का विश्लेषण किया।

#### 7. वर्षा-जल संग्रहण इकाइयाँ

- ग्यारहवीं योजना तक 16 कृषि विज्ञान केन्द्रों में सूक्ष्म सिंचाई प्रणाली के साथ स्थापित वर्षा-जल-संग्रहण इकाइयों का उपयोग करते हुए कुल 56 प्रशिक्षण कार्यक्रम एवं 183 प्रदर्शन कार्यक्रम चलाए गए तथा 15025 रोपण-सामग्रियाँ तैयार की गईं। इसके अतिरिक्त 17028 किसानों एवं 916 अधिकारियों ने इन इकाइयों का भ्रमण किया और वर्षा-जल संग्रहण तकनीकों से परिचित हुए।

#### 8. कृषि विज्ञान केन्द्रों की समाभिरूपता एवं संपर्क

- कृषि विज्ञान केन्द्रों ने इस क्षेत्र के अधिकांश जिलों के कृषि प्रौद्योगिकी प्रबंधन एजेंसी (आत्मा)के पूर्ण सहयोग से कार्य किया है। इस वर्ष के दौरान कृषि विज्ञान केन्द्रों ने 'आत्मा' के 1496 कार्यक्रमों में भाग लिया है तथा उसी समय कृषि विज्ञान केन्द्रों ने 'आत्मा' के सहयोग से 448 कार्यक्रम आयोजित भी किए। 'आत्मा' के संपर्क का उपयोग करते हुए 44 कृषि विज्ञान केन्द्रों ने प्रशिक्षण कार्यक्रम, 19 कृषि विज्ञान केन्द्रों ने प्रदर्शन कार्यक्रम और 18 कृषि विज्ञान केन्द्रों ने प्रदर्शिनियों का आयोजन किया। पन्द्रह कृषि विज्ञान केन्द्रों ने कृषि पाठशाला में भाग लिया और तकनीकी संबंधी निपुणता प्रदान की।
- बयालीस कृषि विज्ञान केन्द्रों को पौध किस्म एवं कृषक अधिकार संरक्षण प्राधिकरण ने वित्तीय सहायता प्रदान की। कृषि तकनीकी प्रबंधन एजेंसी और नारियल विकास बोर्ड ने क्रमशः 24



एवं 20 कृषि विज्ञान केन्द्रों को वित्तीय सहायता प्रदान की। कृषि विज्ञान केन्द्रों को राष्ट्रीय कृषि विकास योजना, विकास विभाग और महिला एवं बाल कल्याण विभाग से भी वित्तीय सहायता प्राप्त हुई।

### 9. सफलगाथा : एक झलक

- बैंगलूरु ग्रामीण जिले के कृषि विज्ञान केन्द्र के प्रयासों से दोड्डबल्लापुर तहसील के करेपुरा के किसानों ने रागी की किस्म एमएल-365 को अपनाया और उन्हें 24.24 किं. की पैदावार प्राप्त हुई, जिससे उन्हें रु. 40000/- की शुद्ध आय प्राप्त हुई। किसानों ने बताया कि एमएल-365 किस्म ने दाना भरने के चरण में नमी-प्रतिबल को सहन किया और इसमें कटाई के समय भी हरे पुआल के बने रहने के अतिरिक्त सभी एक ही साथ में परिपक्व हुई।
- कृषि विज्ञान केन्द्र के पूर्व प्रशिक्षु, श्रीमती रूपा राजेन्द्र रागी के मूल्य-संवर्धित उत्पाद बनाने के उद्यम की स्थापना की और इससे उन्हें रु. 3.6 लाख की वार्षिक आय प्राप्त हुई। श्रीमती रूपा ने विभिन्न सुवास के रागी माल्ट, हुरचिट्टु, चक्कली एवं लड्डू बना कर 'चिरायुष खाद्य पदार्थ' के ब्रांड नाम से खुद की किराने की दूकान, कृषि विज्ञान केन्द्र के विक्रय कक्ष और चिंतामणि, चिकबल्लापुरा, बैंगलूरु के बेकरी, स्वीट मार्ट, अन्य किराने की दूकान एवं मेडिकल दूकान और महिला एवं बाल कल्याण विभाग, चिकबल्लापुरा द्वारा प्रदान किए गए मोबाइल वैन के माध्यम से बेचना प्रारंभ किया। मासिक औसत उत्पादन 350 कि.ग्रा. तक होता है, जिससे उन्हें रु. 30000-40000 का शुद्ध लाभ प्राप्त होता है। श्रीमती रूपा की सफलता को देख कर कई किसान एवं कृषक महिलाएँ उसी प्रकार के उद्यम को शुरू करने के लिए कृषि विज्ञान केन्द्र एवं श्रीमती रूपा के पास सलाह के लिए आए।
- श्रीमती सरोजा, जी.सी. कर्नाटक के तुमकूरु जिले के देवरायपटणा गाँव का प्रगतिशील किसान है, जिन्होंने कृषि विज्ञान केन्द्र, तुमकूरु-ए (हीरेहल्ली) के तकनीकी मार्गदर्शन के तहत पॉलिथीन पलवार एवं टपक सिंचाई के साथ बहु-सब्जी फसल-प्रणाली अपनाई। उन्होंने एक एकड़ में ग्रीष्म टोमेटो की खेती की, जिसके बाद उसी पॉलिथीन पलवार एवं टपक सिंचाई-प्रणाली का उपयोग करते हुए फ्रेंचबीन एवं गेंदे की भी खेती की और उन्हें प्रति वर्ष प्रति एकड़ से रु. 3.57 लाख की शुद्ध आय प्राप्त हुई। वे अपने एवं पड़ोसी गाँव की कृषक महिलाओं के लिए आदर्श बन चुकी हैं।
- कर्नाटक के रामनगरा जिले के मागडी तहसील के

चन्दुरायनाहल्ली के श्रीमती शारदा बाई ने अपने 20 गुण्टा भूमि में कृषि विज्ञान केन्द्र, रामनगरा के तकनीकी मार्गदर्शन में घर के पिछवाड़े में कुक्कुड पालन को अपनाया है। उनकी कुक्कुड इकाई में 110 गिरिराजा एवं स्थानीय कुक्कुट हैं। वे प्रति माह अंडे एवं चिकन बेचकर रु. 1754/- की आय प्राप्त करती हैं। उन्होंने बतख-पालन को शामिल करते हुए अपने इस छोटे उद्यम को बढ़ाया है।

- श्रीमती सुहरा, जो तिरुमिट्टकोड, पालक्काड, केरल के बहुत ही साधारण परिवार की शिक्षित महिला है, ने अपने जैसे 20 महिलाओं को साथ लेकर कृषि विज्ञान केन्द्र, पालक्काड के तकनीकी मार्गदर्शन में एक दशक पहले एक खाद्य प्रसंस्करण इकाई की स्थापना की थी। सभी 20 महिलाएँ इस इकाई के कर्मचारी व हिस्सेधारक हैं। पुट्टु, चम्पापुट्टु, पत्तिरी एवं इडियप्पम बनाने का चावल का आटा, जैम, स्वैश, एवं मसाला मिक्स आदि इस इकाई द्वारा तैयार किए जा रहे खाद्य-उत्पाद हैं, जिनको "नेल्लरा" के ब्रांड नाम से बेचा जा रहा है। अब इस इकाई की वार्षिक आय रु. 1.5 करोड़ है। हाल ही में कृषि विज्ञान के मार्गदर्शन में इस इकाई ने "टीन प्लस" नाम स्वास्थ्यवर्धक पेय बनाने का कार्य भी शुरू किया है। इस जिले के विभिन्न आंगनवाडियों में 5.00 टन से ज्यादा "टीन प्लस" का वितरण किया गया है।
- कृषि विज्ञान केन्द्र, कासरगोड के पूर्व प्रशिक्षु श्री पी. रामचन्द्रा, जो कासरगोड के बदियडुका जिले का निवासी है, ने कम जमीन में मधुमक्खी-पालन को अपनाया है। वे इंडियन मधुमक्खी के छत्ते बेचकर रु. 55000/- और काँटे-रहित छत्ते बेचकर रु. 5000/- की आय प्राप्त कर पाए हैं। उन्होंने रु. 8000/- का शहद भी बेचा है। वर्तमान में उनके प्रजनन इकाई में 35 इंडियन मधुमक्खी के छत्ते और 25 काँटे-रहित मधुमक्खी के छत्ते हैं। उन्होंने पाया कि मधुमक्खी-पालन से आसपास के क्षेत्रों में नारियल, काजू और सब्जी-फसलों की उपज में 15-20% की बढ़ोत्तरी हुई है। उनकी सफलता को देखकर 45 किसानों/मधुमक्खी-पालकों ने उनसे छत्ते लिए हैं।
- कृषि विज्ञान केन्द्र, कन्याकुमारी ने मजदूरों की कमी को दूर करने के लिए किसानों को जिले में धान की खेती में यंत्रीकरण को अपनाने के लिए प्रेरित किया है। फलस्वरूप, किसानों ने रबी के मौसम में लगभग 500-600 हेक्टेयर में धान की रोपाई के लिए यंत्र को अपनाया। धान की खेती में यंत्रीकरण लाने से 44 श्रम-शक्ति की बचत की जा सकी तथा इससे 2.31 के लाभ-लागत अनुपात के साथ रु. 42900/- की शुद्ध आय



प्राप्त हुई। किसान ट्रे बनाने एवं रोपाई के लिए अनुबंध-आधार पर यंत्रीकरण की सुविधा ले रहे हैं। कम्बाइन्ड हार्वेस्टर से कटाई करने के बाद पुआल को एक साथ बाँधने के लिए भी मशीन का प्रयोग किया जा रहा है। वर्तमान में कन्याकुमारी जिले में 75-80% धान की कटाई कम्बाइन्ड हार्वेस्टर से की जाती है।

- करूर जिले के तोगमलई खंड के श्री सुब्रह्म्यन एक प्रगतिशील किसान है, जिन्होंने कृषि विज्ञान केन्द्र, करूर के तकनीकी मार्गदर्शन में अपने धान के खेत में अनुशंसित स्तर पर संतुलित उर्वरक के प्रयोग के साथ में समेकित नाशीजीव-प्रबंधन को अपनाया है। समेकित नाशीजीव-प्रबंधन को अपनाने से उन्होंने खेती की लागत में रु. 40000/हे. प्रति फसल की कमी कर पाए। उन्होंने समेकित नाशीजीव-प्रबंधन की तकनीकी को अपने एवं आसपास के गाँवों के 100 से ज्यादा किसानों को बाँटा है।
- कृषि विज्ञान केन्द्र, त्रिची ने किसानों को लालगुडी एवं पुल्लमपाडी खंडों के डेल्टा क्षेत्रों में अंतःस्थलीय मछली-पालन को अपनाने में मदद की। जब धान के किसानों की वार्षिक आय रु. 15000/माह/हे. है, तो धान के साथ में अंतःस्थलीय मछली-पालन भी करने से आय रु. 35000/माह/हे. बढ़ी, जिसका लाभ-लागत अनुपात 1:1.8 है। श्री फ्रेडरिक निक्सन ने वर्ष 2013 के दौरान 8.5 एकड़ के धान के खेत के अपने मछली-तालाब को बढ़ाया, जिससे उनकी वार्षिक आय 2.3 लाख/वर्ष हुई। उन्होंने तिरुचिरापल्ली के आसपास के गाँवों के किसानों के 105 मछली-तालाबों के लिए छोटी मछलियों को वितरित किया।
- कृषि विज्ञान केन्द्र, तूतुकुडी ने प्रोसोपिस (प्रोसोपिस जूलीपलारा) को पशुधन के आहार के रूप में बढ़ावा दिया। विलथिकुलमि गाँव में फली इकट्ठा करने वालों, उद्यमियों, पशुधन-मालिकों एवं व्यापारियों के सहयोग से सितंबर 2014 में पीसने की चक्की की स्थापना की गई। इस वर्ष के दौरान 8 टन फलियों को इकट्ठा करने एवं प्रसंस्करण करने के द्वारा इस उद्यम से चक्की में 240 श्रम-शक्ति और फली इकट्ठा करने वालों की 267 श्रम-शक्ति का सृजन किया गया। प्रोसोपिस फली का आटे का उपयोग बाजरा/गेहूँ के भूसे के बदले उपयोग किया जा सकता है। इससे पशुधन-मालिक रु. 5/कि.ग्रा. तक बचा सके (प्रोसोपिस फली के आटे की कीमत रु.16 है, जबकि बाजरा/गेहूँ के भूसे की कीमत 21/कि.ग्रा. है)। पशुधन के मालिकों का लाभ काफी हद तक बढ़ा।

### 10. पुरस्कार एवं मान्यताएँ

- कृषि विज्ञान केन्द्र, बीदर द्वारा मार्गदर्शन दिए प्रगतिशील किसान श्री मोहम्मद ईदरिश अहमद कादरी को माननीय प्रधानमंत्री श्री नरेंद्र मोदी जी के करकमलों से 29.07.2014 को 86वें स्थापना दिवस समारोह के दौरान जगजीवन राम अभिनव किसान पुरस्कार प्राप्त हुआ।
- कृषि विज्ञान केन्द्र, नामक्कल को सर्वश्रेष्ठ क्षेत्रीय 'निकरा(राष्ट्रीय जलवायु समुत्थानशील कृषि पहल)' कृषि विज्ञान केन्द्र का पुरस्कार प्राप्त हुआ। यह पुरस्कार केन्द्रीय बारानी कृषि अनुसंधान संस्थान, हैदराबाद में 29.11.2014 को आयोजित पुरस्कार वितरण समारोह में कृषि विज्ञान केन्द्र, नामक्कल के कार्यक्रम समन्वयक ने प्राप्त किया।

### 11. कृषि प्रौद्योगिकी सूचना केन्द्र (एटिक)

- रिपोर्टाधीन वर्ष के दौरान 12231 किसान, 1960 विस्तार कार्यकर्ता एवं 14103 अन्य साझेदारों ने इस क्षेत्र के कृषि प्रौद्योगिकी सूचना केन्द्र का भ्रमण किया। कुल मिलाकर 9944 व्यक्तियों ने सूचना के लिए तथा 18350 ने तकनीकी उत्पादों के लिए कृषि प्रौद्योगिकी सूचना केन्द्र का भ्रमण किया।
- किस्में एवं संकर किस्में (2810), कृषि-तकनीक (1763), पशुपालन एवं मात्स्यिकी (1589) और रोग-प्रबंधन (1257) पर कृषि प्रौद्योगिकी सूचना केन्द्रों ने मुख्य रूप से सूचनाएँ प्रदान कीं।
- प्रकाशन के तहत कृषि प्रौद्योगिकी सूचना केन्द्र ने 7599 पुस्तकें एवं 10701 तकनीकी बुलेटिनें प्रकाशित कीं और 14 सीडी, 1413 डीवीडी और 78 वीडियो फिल्मों का निर्माण किया तथा भ्रमणकारियों या ई-मेल द्वारा प्रार्थित व्यक्तियों को वितरित किया।

### 12. विस्तार निदेशालय द्वारा प्रौद्योगिकी का समर्थन

- विस्तार निदेशकों और अन्य अधिकारियों ने 41 विज्ञान सलाहकार समिति की बैठकों, 55 प्रक्षेत्र दिवसों, 45 कार्यशालाओं/संगोष्ठियों, परिसर बाह्य प्रशिक्षण सहित 30 प्रशिक्षण कार्यक्रमों और 21 प्रौद्योगिकी सप्ताहों में भाग लिया। उन्होंने कृषि विज्ञान केन्द्र के अधिकारियों की बैठकें, कृषक बैठकें, पशु-स्वास्थ्य शिविर, गाँवों में कृषक समूह/सोसाइटी का उद्घाटन, कृषि मेला जैसे 35 अन्य कार्यक्रमों में भी भाग लिया।
- इस वर्ष के दौरान निदेशालय के प्रयासों से 29 कृषि विज्ञान केन्द्रों को 146.35 किं. बीज, 16 कृषि विज्ञान केन्द्रों को 0.19 लाख रोपण सामग्रियाँ, 20 कृषि विज्ञान केन्द्रों को 57.80 किं.



जैविक उत्पाद, 8 कृषि विज्ञान केन्द्रों को 29पशुधन, 7 कृषि विज्ञान केन्द्रों को 8600 कुक्कुट और 2 कृषि विज्ञान केन्द्रों को 3.13 किंव. पोषक तत्व मिश्रण आदि उपलब्ध कराए गए।

### 13. विशेष कार्यक्रम

- दलहन के उत्पाद को बढ़ाने के लिए प्रौद्योगिकी प्रदर्शन के तहत विशेष प्रयास के रूप में कर्नाटक एवं तमिलनाडू के एनएफएसएम लागू किए गए जिलों में 171.20 हेक्टेयर में अरहर, उड़द, मूँग और चना पर 419 प्रदर्शन चलाए गए।
- राष्ट्रीय जलवायु समुत्थानशील कृषि पहल के तहत 1473 किसानों को शामिल करते हुए कुल 414 हेक्टेयर क्षेत्रफल में एनआरएम से संबंधित अंतःक्षेपों से उपचार किया गया। फसल-प्रदर्शनों में 1299 किसानों ने 543.5 हेक्टेयर में फसल-तकनीकियों को अपना लिया। पशुधन-अंतःक्षेपों में 880 प्रदर्शन चलाए गए, जिनमें पशुओं की 302 उन्नत नस्लें, 4003 पशुओं के लिए टीकाकरण, 2918 कुक्कुट एवं 25000 छोटी मछलियाँ शामिल हैं। अजोल्ला की 35 इकाइयों की स्थापना के अलावा उन्नत चारा उत्पादन के लिए साइलेज बनाने की 5 इकाइयों की स्थापना की गई तथा 238 प्रदर्शन भी चलाए गए। संस्थागत तंत्र के रूप में चारा बैंक के रूप में 5.42 हेक्टेयर, बीज बैंक के रूप में 13 हेक्टेयर तथा छः माल-समूह तैयार किए गए। यंत्रिकरण के तहत परियोजना के तहत गाँवों में स्थापित भाड़े पर मशीन देने वाले केन्द्रों से विभिन्न यंत्रों को भाड़े पर लेकर 23.74 हेक्टेयर क्षेत्र में खेती की गई। क्षमता-विकास के तहत जलवायु समुत्थानशील कृषि से संबंधित 109 प्रशिक्षण कार्यक्रम आयोजित किए गए, जिनसे 3378 किसान लाभान्वित हुए। इसके अतिरिक्त 4307 किसानों एवं विस्तार कार्यकर्ताओं को सम्मिलित करते हुए 362 विस्तार गतिविधियाँ आयोजित की गईं।

### 14. क्षेत्रीय परियोजना निदेशालय द्वारा की गई गतिविधियाँ

- कृषि में मूलभूत, रणनीतिक एवं सीमांत अनुप्रयोग अनुसंधान के लिए राष्ट्रीय निधि से प्राप्त रु. 89.11 लाख की वित्तीय सहायता से 01.04.2011 से "कृषि नवाचारों पर किसानों के निर्णय लेने के व्यवहार का विश्लेषण" नामक अनुसंधान परियोजना लागू की गई है। डॉ. एम.जे. चन्द्रेगौडा, प्रधान वैज्ञानिक (कृषि विस्तार) इस परियोजना के प्रधान अन्वेषक हैं। क्षेत्रीय परियोजना निदेशालय इसका प्रमुख केन्द्र है तथा कृषि विश्वविद्यालय, धारवाड, ग्रामीण प्रबंधन संस्थान, आनंद और गैर-सरकारी संगठन 'समूह' इसके तीन साझेदार हैं। कर्नाटक एवं गुजरात 22 गाँवों में धान, मूँगफली, कपास, आलू एवं मक्का के संबंध में नवाचारों पर किसानों के निर्णय लेने के व्यवहार का अध्ययन किया गया। इस परियोजना की अवधि दो वर्ष है।

- निदेशालय ने भाकृअनुप-राष्ट्रीय समेकित नाशीजीव प्रबंधन अनुसंधान केन्द्र, नई दिल्ली के सहयोग से राष्ट्रीय कृषि कीट संसाधन ब्यूरो, बैंगलूरु में जैव-नियंत्रण के विशेष संदर्भ में कर्नाटक, केरल, तमिलनाडू, गोवा, पुदुच्चेरी और लक्षद्वीप की प्रमुख फसलों में समेकित नाशीजीव प्रबंधन पर प्रशिक्षण कार्यक्रम आयोजित किए।
- निदेशालय ने कृषि विज्ञान केन्द्र, तृशूर एवं बीजापुर में प्रौद्योगिकी का मूल्यांकन, परिष्करण एवं प्रदर्शन पर अभिमुखीकरण कार्यक्रम आयोजित किए तथा क्षेत्र-8 के नवनियुक्त 48 कर्मचारियों को प्रशिक्षित किया।
- निदेशालय ने कृषि विश्वविद्यालय, धारवाड में 28-30 अक्टूबर 2014 के दौरान "ज्ञान एवं आर्थिक सशक्तिकरण के लिए सीमांत गृह विज्ञान प्रौद्योगिकियाँ" पर कार्यशाला आयोजित की।
- निदेशालय ने कृषि विज्ञान केन्द्र, ईरोड और मैसूर में "सहभागी प्रभाव-निगरानी एवं मूल्यांकन" पर प्रशिक्षण आयोजित किए, जिनसे कृषि विज्ञान केन्द्र के 50 कर्मचारी लाभान्वित हुए।
- निदेशालय ने 9 जनवरी 2015 को कर्नाटक के कृषि विशेषज्ञों के साथ भारत सरकार के कृषि मंत्री की बैठक आयोजित करने में सक्रिय भूमिका निभाई।
- दि हिन्दु के सहयोग से युवाओं में कृषि के प्रति रुचि लाने एवं इसे बनाए रखने के विषय में 25 अक्टूबर 2014 को केन्द्रीय खारा जलजीव पालन अनुसंधान संस्थान, चेन्नई में एक मस्तिष्क मंथन सत्र आयोजित किया गया, जिसमें कृषि में ग्रामीण युवा वर्गों को आकर्षित करने एवं बनाए रखने तथा स्कूली बच्चों में खेती के प्रति जागरूकता बढ़ाने की रणनीतियों पर चर्चा की गई।
- निदेशालय ने राष्ट्रीय कृषि अनुसंधान प्रबंधन अकादमी, हैदराबाद द्वारा आयोजित आधारभूत प्रशिक्षण कार्यक्रम में कृषि विस्तार विभाग, भारतीय कृषि अनुसंधान परिषद के सहयोग से नौ कार्यक्रम समन्वयकों की उपस्थिति के लिए आवश्यक कार्य किए।
- कुल 13 लेख/रिपोर्ट/आलेख प्रकाशित किए गए। बारह बैठकें/कार्यशालाएँ आयोजित की गईं। क्षेत्रीय परियोजना निदेशक और निदेशालय के कर्मचारियों ने 19 बैठकें/कार्यशालाओं/सम्मेलना/संगोष्ठियों में भाग लिया। कृषि विज्ञान केन्द्रों द्वारा 41 एसी बैठकें आयोजित की गईं।



## Executive Summary

The Indian Council of Agricultural Research (ICAR) has established the network of Krishi Vigyan Kendras (KVKs) at district level under different host organizations viz., ICAR Institutes, State Agricultural Universities (SAUs), Non-Governmental Organizations (NGOs), Deemed Universities (DUs) and State Department of Agriculture (SDA). As on March 31, 2015, 642 KVKs were established in the country, out of which 81 KVKs are in Zone VIII. The Zonal Project Directorate-Zone VIII coordinates, plans, monitors and evaluates the technological interventions and frontline extension programmes of 81 KVKs in Karnataka (31), Tamil Nadu (30), Kerala (14), Puducherry (3), Goa (2) and Lakshadweep (1).

Assessment, refinement and demonstration of technologies are carried out by the KVKs with technological backstopping from SAUs and ICAR Institutes in partnership with farmers and other stakeholders. KVKs organized need-based capacity development programmes for its stakeholders and create awareness about improved agricultural technologies through appropriate frontline extension programmes. Production and supply of quality seeds, planting material, livestock breeds, animal products and bio-products have been undertaken to facilitate initial uptake of technologies. Thus, KVKs are serving as knowledge and resource centres of agricultural technology to support the initiatives of public, private and voluntary sectors for improving agricultural economy of the district. Salient achievements during the year (2014-15)

are summarized as follows:

### 1. Technology Assessment and Refinement

- A total of 343 technologies were assessed and nine technologies were refined by KVKs through 2034 OFTs at 374 locations. Out of these 91.95% of technologies were under crops and remaining under livestock, poultry, fisheries and others.
- Under crops, a total of 315 technologies were assessed, which included varietal evaluation (125) integrated crop management (42), integrated nutrient management (32), integrated disease management (31), integrated pest management (30), cropping system (13) and integrated pest and disease management (13).
- Under animal husbandry, a total of 20 technologies were assessed, of which ten were in Production and Management, five in Nutrition Management, three in evaluation of breeds and two in disease management.
- Gangavathy variety of paddy performed well in saline affected soils yielding up to 56 q/ha in Mandya district with a BC ratio of 2.40.
- ADT 49 and Samba Mashuri varieties of paddy were found to be tolerant to Bacterial Leaf Blight disease in Tamil Nadu and yielded up to 36 q/ha with BC ratio of 1.29 and 1.22 respectively.
- Soil application of *Trichoderma* and



*Pseudomonas*, spraying of Mancozeb 0.25% and Fenamidone + Mancozeb 0.3% gave better yield in potato and reduced the incidence of late blight disease.

## 2. Frontline Demonstrations

- Out of a total of 9068 front line demonstrations organized, 1359 were on cereals, 486 on millets, 444 on oilseeds, 540 on pulses, 189 on commercial crops, 285 on fodder crops, 790 on vegetable crops, 124 on tuber crops, 743 on fruit crops, 1863 on flowers and aromatic crops, 399 on spice crops, 145 on plantation crops.
- Besides the above, 849 demonstrations on hybrids of various crops, 419 special pulse demonstrations in the NFSM districts, 121 on farm implements, 1359 on livestock and fisheries and 791 on enterprises covering an area of 2388.17 ha were carried out in the states of Karnataka, Tamil Nadu, Kerala, Goa and UTs of Puducherry were organized.

## 3. Capacity Development

- During the year under report, 5471 training courses were organized for 202619 persons. Majority of the training courses were for farmers/farmwomen category in which more than 1.54 lakh farmers/farm women were trained. The major training areas for farmers/farm women category were crop production (1101 courses), plant protection (688 courses), home science/women empowerment (563 courses), livestock production and management (477

courses), soil health and fertility management (340) and vegetable crop (286 courses). Training courses organized for rural youth (552 courses, 18680 participants) included integrated farming (65 courses), mushroom production (61 courses), nursery management of horticulture crops (48 courses), bee keeping (28 courses) and planting material production (24 courses). A total of 333 courses were organized for 11255 extension functionaries. Among the different training areas for extension functionaries, productivity enhancement in field crops (96 courses and 3200 participants) and integrated pest management (46 courses and 1287 participants) were the major areas.

- A total of 328 sponsored training programmes were conducted by the KVKs in 13 different areas for the benefit of 13466 participants. Major area of training was increased production and productivity of crops (169) and soil health and fertility management (38). In addition, 131 vocational training courses were organized during the year involving 4555 participants, mostly the rural youth. Among the different vocations, value addition (31 courses), integrated crop management (18) and mushroom production (9 courses) were the major areas of training.

## 4. Frontline Extension Programmes

- KVKs organized a total of 1.15 lakh extension programmes with a cumulative participation of 35.23 lakh farmers and



1.40 lakh extension personnel on various aspects of agriculture and its allied sectors like varietal performance, production technologies, integrated pest and disease management, animal health and nutrition, production technologies of poultry, fisheries and human nutrition. During the year, KVKs disseminated relevant technologies through newspaper coverage (1980) followed by extension literature (1018), popular articles (601), radio talks (444), TV talks (340), research papers (200), newsletter issues (165), technical bulletins (95), and books / book chapters (50). Further, KVKs developed 302 video CDs/DVDs on various technologies and made them available for sale to farmers and other stakeholders.

### 5. Production of Technological Inputs

- KVKs produced and supplied 486.23 t of seeds of different crop varieties, 34.50 lakh planting materials of different crops and hybrids, 2.18 lakh of livestock strains, fish fingerlings and other bio products benefiting 2.91 lakh farmers.
- KVKs produced and supplied 1194.85 t of bio products, 49000 numbers of EPN, 24327 pheromone traps, 5600 *Acerophagus papaya* (papaya mealy bug parasitoids) and 727 Trico cards through which nearly 66547 farmers were motivated to adopt bio-control by reducing use of chemicals.

### 6. Soil Water and Plant Testing Analysis

- Soil, water and plant testing laboratories have been established in 67 KVKs for

providing analytical services to farmers in the zone. During the year, a total of 41538 samples of soil, water, plant, manure and leaf tissue received from 36117 farmers belonging to 20876 villages were analyzed with realization of Rs. 34.32 lakh. State-wise data showed that KVKs in Karnataka analyzed 24751 samples, 8524 in Kerala, 7700 in Tamil Nadu, 289 Goa and 274 in Puducherry.

### 7. Rain Water Harvesting Units

- Using the rainwater harvesting units with micro irrigation system established in 16 KVKs till XI Plan, a total of 56 training courses and 183 demonstrations were conducted and 15025 planting materials were produced. Further, 17028 farmers and 916 officials visited these units and got acquainted with the rainwater harvesting techniques.

### 8. Convergence and Linkages of KVKs

- KVKs worked in close collaboration with Agriculture Technology Management Agency (ATMA) in most of the districts of the Zone. KVKs participated in 1496 programmes of ATMA during the year and at the same time KVKs organized 448 programmes in collaboration with ATMA. Using the linkage with ATMA, 44 KVKs conducted training programmes, 19 KVKs conducted demonstrations, and 18 KVKs conducted exhibitions. Fifteen KVKs participated in the farm schools and provided technical expertise.
- Financial assistance was provided by



Protection of Plant Varieties and Farmers Rights Authority (PPVFRA) to 42 KVKs. Agricultural Technology Management Agency (ATMA) and Coconut Development Board extended financial assistance to 24 and 20 KVKs respectively. KVKs also received financial assistance from Rashtriya Krishi Vikas Yojana (RKVY), Development Departments and Department of Women and Child Development.

### 9. Successful cases: A glimpse

- With the efforts of KVK Bengaluru Rural, the farmers of Karepura of Doddaballapur taluk adopted finger millet cv. ML-365 and harvested 24.24 q finger millet per ha realizing a net income of Rs. 40000/ha. Cv.ML-365 withstood moisture stress during grain filling stage, exhibited uniform maturity besides retaining green straw even at the harvesting stage, farmers said.
- Ex-trainee of KVK Chikkaballapura Smt. Roopa Rajendra is able to establish successful enterprise on value added products from finger millet and earning a net annual income of around Rs.3.6 lakhs. Smt. Roopa is involved in preparation and marketing of finger millet malt with different flavors, Hurihittu, Chakkuli, and Ladoo under the registered brand name of “CHIRAYUSH” food products and selling them through their own provision store, KVK outlet, bakery, sweet marts, provision stores and medical Shops in Chintamani, Chikkaballapura, Bangalore and mobile sales van arranged by the Department of Women and Child Welfare, Chikkaballapura. The monthly average production of the products is around 350 kg with a net profit of Rs. 30000-40000. Looking at the success of Smt. Roopa many farmers and farm women have approached KVK as well as Smt. Roopa to take up similar kind of enterprise.
- Smt. Saroja G.C, is a progressive farmer of Devarayapatna village of Tumkur district, Karnataka successfully adopted multiple vegetable cropping with Poly mulch and drip Irrigation under the technical guidance of KVK Tumkur-A (Hirehalli). She cultivates summer tomato followed by French bean and marigold by using same poly mulch and drip irrigation in one acre of land and could earn a total net income of Rs. 3.57 lakh per acre per annum. She is acting as a role model for the farm women of her and neighbouring villages.
- Smt. Sharada Bai residing in Chandurayanalli of Magadi Taluk in Ramanagara District adopted backyard poultry under the technical guidance of KVK Ramanagara in her 0.5 acre of land. Her poultry unit consists of 110 Giriraja birds and local poultry birds. She is earning an income of Rs. 1754 per month from the backyard poultry by selling eggs and chicken. She diversified her tiny enterprise by introducing duck rearing.



- A decade before, Smt. Suharaa school educated lady of very modes background in Thirumittakode, teamed up with about 20 women of the same background and established a food processing unit under the technical guidance of KVK Palghat. All 20 women are employee-cum-shareholders of the unit. The food products of the unit are puttu rice flour, chembaputtu rice flour, pathiri and idiyappam flour, jam, squash, and spice mixes and are marketed under the brand name “Nellara”. Now the unit has an annual turnover of Rs.1.5 crore. Recently the Unit has added the preparation of health food mix “Teen Plus” under the technical guidance of KVK. More than 5.00 t of “Teen Plus” was supplied to different Anganwadis of the district.
- Ex-trainee of KVK Kasaragod, Shri. P. Ramachandra belongs to Badiadka village in Kasaragod district successfully adopted bee colonies in this small patch of land. He was able to earn around Rs.55000 from the sales of Indian bee colonies, Rs. 5000 from stingless bee colonies. He also sold honey worth Rs. 8000. At present he has 35 Indian bee colonies and 25 stingless bee colonies in his breeding unit. He has observed that the bee keeping has resulted in around 15 – 20% yield increase in coconut, cashew and vegetable crops. After seeing the success, colonies were taken by around 45 farmers/bee keepers.
- The efforts of KVK, Kanyakumari motivated the farmers to adopt mechanization in paddy cultivation in the district to address labour scarcity. As a result, farmers have adopted mechanical paddy transplanting in about 500-600 ha during rabi season. The mechanization in paddy cultivation resulted in the saving of 44 man days with a net profit of Rs.42900 and BCR of 2.31. Farmers are availing mechanization service on contractual basis for tray preparation and planting. Straw binding machines are also employed to bind the straw after harvesting with combined harvesters. In Kanyakumari district around 75-85% of the paddy is being harvested through combined harvester at present.
- Shri. Subbaiyan of Thogaimalai block, Karur district is a progressive farmer adopted IPM along with balanced fertilizer application at the recommended level in his paddy field under the technical guidance of the KVK Karur. By adopting IPM, he has reduced the cost of cultivation by Rs.4000/ha per crop in paddy cultivation. The farmer has shared the benefits of IPM technology to over 100 farmers in his village and neighboring villages.
- KVK Trichy helped the farmers to undertake inland aquaculture in a successful manner in delta region of Lalgudi and Pullampadi blocks. While the average income of a paddy farmer was Rs.15000/ month /ha of land, with inland fish production, the income of the farmers



has increased to Rs.35000/month/ha, with a cost benefit ratio of 1:1.8. Shri. Fedrick Nickson expanded his fish pond in 8.5 acres of paddy fields during 2013 and enhanced his farm income to 2.3 lakh per year. He supplied fingerlings to 105 fish ponds in and around in Tiruchirappalli district.

- KVK, Tuticorin promoted pods of prosopis (*Prosopis juliflora*) as livestock feed. A grinding mill was established at Vilathikulam through a collaborative effort of pod collectors, entrepreneurs, livestock owners and traders in September 2014. The venture resulted in creation of 240 men days of work at mill and 267 man days of work for the pod collectors during this year 2014 by collection and processing of 8 t pods. The prosopis pod flour served as a cheap replacement for pearl millet/wheat bran and the livestock owners could save up to Rs.5/Kg (cost of the pod flour in Rs.16 whereas the cost of wheat bran/pearl millet in Rs.21/kg). The profit margin for the livestock farmers was enhanced substantially.

### 10. Awards and Recognition

- KVK Bidar was conferred with Best Zonal KVK award of ICAR for Zone VIII for the year 2013 for its outstanding achievements. The award was presented by Union Minister of State for Agriculture, Government of India during ICAR Directors and Vice-Chancellors of

Agricultural Universities Conference on 15.5.2015 at New Delhi.

- Jagjivan Ram Abhinav Kisan Puraskar 2013 was received by Shri. Mohammed Idris Ahmed Quadri, a progressive farmer mentored by KVK Bidar, Karnataka from Hon'ble Prime Minister of India, Sri. NarendraModiji on 29.7.2014 during 86<sup>th</sup> Foundation day at New Delhi.
- KVK Namakkal was awarded as best Zonal NICRA KVK 2014. Award was received by ProgrammeCoordinator, KVK Namakkal in the award ceremony held at CRIDA, Hyderabad 29<sup>th</sup> November 2014

### 11. Agricultural Technology Information Centres (ATICs)

- During the period under report, a total of 12231 farmers, 1960 extension personnel and 14103 other stakeholders visited Agriculture Technology Information Centres (ATICs) in the Zone. Altogether, 9944 visited for information and 18350 visited for technology products.
- Varieties and hybrids (2810), agro-techniques (1763), animal husbandry and fisheries (1589) and disease management (1257) were the major areas of information provided by the ATICs.
- Under publications, 7599 Books, 10701 Technical bulletins, 14 CDs, 1413 DVDs and 78 Video films were produced and provided to the ATIC visitors or those requested by mail.



## 12. Technology Backstopping by Directorates of Extension

- Directors of Extension and their officials participated in 41 Scientific Advisory Committee Meetings, 55 field days, 45 workshops/seminars, 30 training programmes including off campus programmes and 21 Technology Weeks. They also attended in 35 other programmes like group discussion with KVK officials, farmers meet, animal health camp, inauguration of farmers group / society in villages, Krishi Mela etc.
- During the year, 146.35 quintals of seeds to 29 KVKs, 0.19 lakh of planting materials to 16 KVKs, 57.80 quintals of bio-products to 20 KVKs, 29 livestock to 8 KVKs, 8600 poultry birds to 7 KVKs, and 3.13 quintals of nutrient mixture for 2 KVKs were made available through the efforts of Directorates.

## 13. Special Programmes

- A total of 419 demonstrations on pigeon pea, black gram, green gram, and chickpea covering an area of 171.20 ha were implemented in the NFSM implementing districts of Karnataka and Tamil Nadu states as a special drive under technology demonstration for harnessing pulse production.
- Under NICRA, a total of 414 ha area was treated with NRM related interventions covering 1473 farmers. In the crop demonstrations, 1299 farmers implemented crop technologies in an area

of 543.5 ha. In the livestock interventions, 880 demonstrations included 302 improved breeds of animals, vaccination for 4003 animals, 2918 poultry birds and 25000 fish fingerlings. Besides establishing 35 units of azolla and five units of silage making, 238 demonstrations were taken up on improved fodder cultivation. As an institutional mechanism, 5.42 ha area as fodder bank, 13 ha area as seed bank and six commodity groups were established. Under mechanization, 23.74 ha area was cultivated availing various implements from the custom hiring centres established in the villagers under the project. Under capacity building 109 training courses relating to climate resilient agriculture benefitting 3378 farmers were organized. In addition, 362 extension activities were carried out involving 4307 farmers and extension personnel.

## 14. Activities at the Zonal Project Directorate

- A Research Project on “Behavioural Analysis of Farmers Decision Making on Agricultural Innovations” is being implemented since 01.04.2014 with a financial assistance Rs.89.11 lakh under National Fund for Basic, Strategic and Frontier Application Research in Agriculture (NFBSFARA). Dr.M.J.Chandre Gowda, Principal Scientist (Agricultural Extension) is the



Principal Investigator of the project. Zonal Project Directorate is the Lead Centre with three Partner Institutes namely University of Agricultural Sciences, Dharwad, Institute of Rural Management Anand (IRMA) and Samuha NGO. Farmers decision making behavior on agricultural innovations related to paddy, groundnut, cotton, potato and maize is being studied in 22 villages of Karnataka and Gujarat. The sanctioned duration of the project is two years.

- The Directorate organized Training Programme on Integrated Pest Management in Important Crops of Karnataka, Kerala, Tamil Nadu, Goa, Puducherry and Lakshadweep with special reference to bio-control at NBAIR, Bangalore and KVK, Puducherry in coordination with ICAR National Centre for Integrated Pest Management (NCIPM), New Delhi.
- The Directorate organized orientation training courses on Technology Assessment, Refinement and Demonstration at KVK, Thrissur and KVK Bijapur and trained 48 newly recruited KVK staff of Zone VIII.
- Directorate organized Workshop on “Frontier Home Science Technologies for Knowledge and Economic Empowerment” held at UAS Dharwad from 28-30<sup>th</sup> October 2014.
- Directorate organized Training on Participatory Impact Monitoring and Assessment at KVK, Erode and KVK, Mysore benefitting 50 KVK Staff members.
- Directorate actively involved in organizing Interactive Meeting of Union Agriculture Minister with Agriculture Experts of Karnataka on 9<sup>th</sup> January, 2015.
- A Brainstorming session on creating and sustaining interest in agriculture among the youth was conducted on 25<sup>th</sup> October 2014 at CIBA Chennai in coordination with The Hindu, in which strategies for Attracting and Retaining Rural Youth in Agriculture (ARYA) and promotion of awareness about farming among school children were discussed.
- Directorate in coordination with the Division of Agricultural Extension, ICAR facilitated the participation of nine Programme Coordinators in the Foundation Training conducted by NAARM Hyderabad.
- A total of 13 articles/reports/papers were published, 12 meetings/workshops were organized and Zonal Project Director and staff of Directorate participated in 19 meetings/workshops/conferences/seminars and 41 SAC meetings organized by the KVKs.



## Chapter 1

# About Zonal Project Directorate

The Agricultural Extension Division, one of the eight divisions of Indian Council of Agricultural Research (ICAR), New Delhi has established a network of Krishi Vigyan Kendras (KVKs) all over the country. The KVKs are hosted by ICAR, SAUs, State Departments of Agriculture and NGOs to assess, refine and demonstrate

technologies in agriculture and allied sectors. The Agricultural Extension Division headed by the Deputy Director General (Agricultural Extension) monitors and reviews the progress of KVKs through eight Zonal Project Directorates (earlier known as Zonal Coordinating Units) located across the country. The jurisdiction of Zonal Project Directorates is illustrated in Table 1.

**Table 1: Zonal Project Directorates and States**

Zones	No. of States/UTs	States/UTs
I	5	Delhi, Haryana, Himachal Pradesh, Jammu & Kashmir and Punjab
II	4	A & N Islands, Bihar, Jharkhand and West Bengal
III	8	Assam, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim and Tripura
IV	2	Uttar Pradesh and Uttarakhand
V	3	Andhra Pradesh, Telengana and Maharashtra
VI	2	Rajasthan and Gujarat
VII	3	Chhattisgarh, Madhya Pradesh and Odisha
VIII	6	Karnataka, Tamil Nadu, Kerala, Goa, Puducherry and Lakshadweep

### 1.1 Genesis

The Indian Council of Agricultural Research (ICAR) established eight Zonal Coordinating Units in September 1979 to monitor and coordinate the Lab to Land Programme (LLP) launched on the occasion of ICAR's Golden Jubilee celebrations (1979). To begin with, Zonal Coordinating Unit - Zone VIII had its office at

Tamil Nadu Agricultural University (TNAU), Coimbatore. It was shifted to the campus of the Regional Station of National Dairy Research Institute (NDRI) at Adugodi, Bengaluru in September, 1981. The jurisdiction of Zone VIII included Karnataka, Kerala, Tamil Nadu, Puducherry and Lakshadweep. The Unit was converted as a Plan Scheme with additional staff in 1986 and additional objective of monitoring



the other Transfer of Technology projects of ICAR viz., KVK, Trainers Training Centre (TTC), National Demonstration Scheme (NDS), Operational Research Project (ORP), Scheduled Caste and Scheduled Tribe Project and Special Project on Oilseeds. During 1990-91, another objective of implementing and monitoring of National Pulse Project was added. At this juncture, Goa was added to the jurisdiction of the Unit. Zonal Coordinating Units were upgraded as Zonal Project Directorates (ZPDs) during the XI Five Year Plan (2009) and Zonal Coordinators were re-designated as Zonal Project Directors with financial and administrative powers akin to Directors of other ICAR institutes.

1.2 Mandate

Mandate of the Zonal Project Directorate is as follows:

- To formulate, implement, monitor and evaluate strategies on technology assessment,

refinement and demonstration programme of the Council in the respective zone.

- To initiate, plan, coordinate and execute the extension research to support and improve technology dissemination system.
- To link KVK efforts to strengthen extension approaches viz. consortium, convergence, public-private partnership, farmer-led and market-led extension in the zone.
- To dovetail technology application programmes by coordinating and fostering linkages with technology generation and delivery system and other stakeholders of agriculture development in the zone.
- To make periodical reports to the Deputy Director General (Agricultural Extension), ICAR on work plan, progress and evaluation.
- To perform any other duties that may be assigned by the Council.

1.3 Staff

Total sanctioned staff strength of Zonal Project Directorate-Zone VIII, Bengaluru is 18, out of which 16 are filled currently. (Table 2).

Table 2: Staff strength of Zonal Project Directorate-Zone VIII

Category	Sanctioned	Filled
Zonal Project Director (RMP)	1	1
Scientific	6	6
Technical	2	2
Administrative	8	6
SSS (Gr-II)	1	1
<b>Total</b>	<b>18</b>	<b>16</b>

### 1.4 Organizational Structure

The organizational structure of Zonal Project Directorate-Zone VIII and KVKs functioning in this Directorate is depicted in Fig.1.

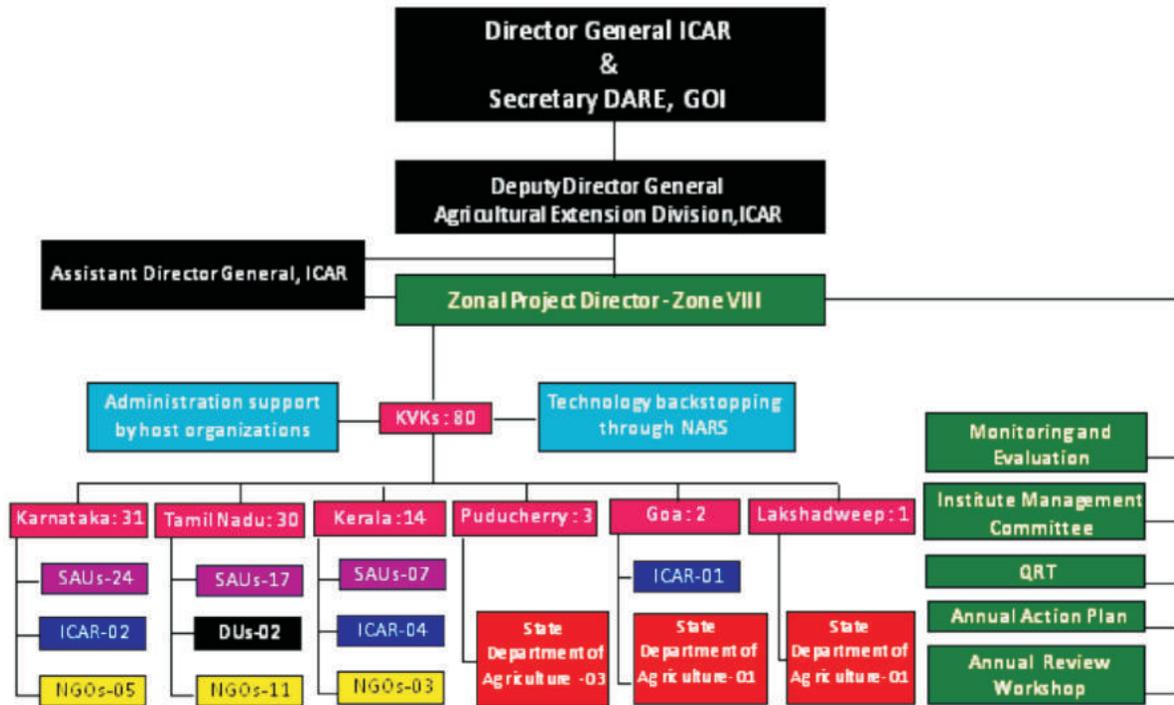


Fig. 1 : Organogram - Zonal Project Directorate, Zone VIII

### 1.5 Major activities

During 2014-15, Zonal Project Directorate Zone VIII organized two major activities viz., the interactive meeting of Union Agriculture Minister with agriculture experts at Zonal Project Directorate, Bengaluru and Annual Zonal Review Workshop of KVKs in Zone VIII at CMFRI, Kochi during 5-8 May, 2014. A brief account of the same is furnished below.

#### 1.5.1 Interactive Meeting of Union Agriculture Minister with Agriculture Experts at Zonal Project Directorate, Bengaluru on 9<sup>th</sup> January, 2015

Shri Radha Mohan Singh, Hon'ble Union Minister for Agriculture, addressed Vice Chancellors of SAUs in Karnataka, Directors of ICAR Institutes based in Bengaluru, Secretaries of the Departments of Agriculture, Horticulture,



Interactive Meeting of Union Agriculture Minister with Agriculture Experts

Animal Husbandry and Fisheries, Government of Karnataka and their respective Directors, Directors of Line Departments and selected Programme Coordinators of KVKs of the State of Karnataka. The interactive meeting was held at ICAR-ZPD, Zone VIII, Hebbal, Bengaluru. He interacted with the participants to take stock of the progress in agriculture and its allied sectors in Karnataka. During the discussion, Agriculture



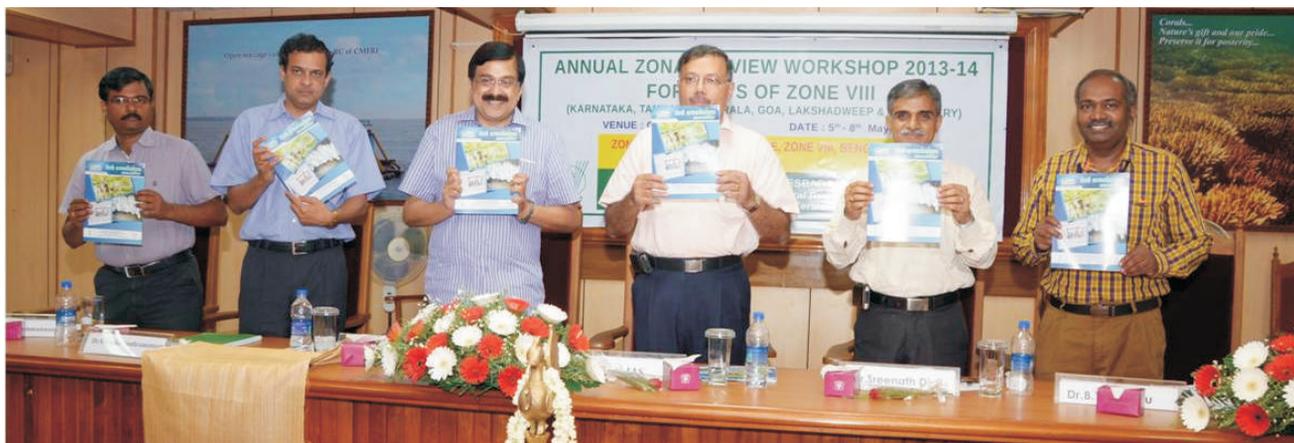
Minister emphasized the importance of taking technologies to farmers, for which better coordination at the district level is required. He expressed that there should be a quarterly meeting with all the line departments, development departments, Director of Extension, Director of Research of concerned SAU and KVK working in the district to transfer the new technologies effectively among farmers. Shri Singh also directed concerned officials to take quick and appropriate actions on KVKs that are not implementing the mandated activities. The Union Agriculture Minister expressed overall satisfaction with the progress made by different development departments in the state. Dr. S.Ayyappan, Secretary, DARE and Director General, ICAR welcomed the Agriculture Minister and participants and briefed about various activities of ICAR Institutes working in Karnataka.

### **1.5.2 Annual Zonal Review Workshop of KVKs in Zone VIII at CMFRI, Kochi**

Workshop was held at CMFRI, Kochi during 5-8 May, 2014. Shri T.K. Jose, IAS, Chairman, Coconut Development Board inaugurated the workshop on 05 May, 2014. A total of 125 participants including Programme Coordinators/SMSs of KVKs and Directors of Extension in Zone VIII, scientists from ICAR institutes and scientists and officers from ZPD-Zone VIII participated in the workshop. Inaugural session started with welcome by Dr. Shinoj Subramanian, Programme Coordinator, KVK, Ernakulam. Dr. Sreenath Dixit, Zonal Project Director, Zone VIII, ICAR, Bengaluru emphasized that KVKs are knowledge and resources centres at district level and they must play active role in promoting scientific agriculture in the district.

Dr. V. Venkatasubramanian, Assistant Director General, ICAR, New Delhi, highlighted that methodological inclusiveness is necessary to change the system for addressing the social development. Shri T.K. Jose, appreciated the KVKs for their support in successful implementation of schemes on coconut development. He stated that *Neera* tapped from coconut inflorescence is a highly nutritious drink and needs to be promoted as natural beverage through *Neera* technicians on network mode with the help of grass root level organizations. Dr.A.Gopalakrishnan, Director, CMFRI, Kochi, in his presidential address appreciated the role of KVKs at grass root level for technology transfer in fisheries sector. During the occasion, he released Newsletter of KVK, Ernakulam. Dr.B.T. Rayudu, Principal Scientist (AE), ZPD-Zone VIII, ICAR, Bengaluru gave vote of thanks.

The workshop was conducted in five technical sessions and four concurrent sessions, each group having 20 KVKs and an Expert Review Panel. Further, the Directors of Extension and ICAR Institutes presented frontier technologies of their respective organizations in agriculture and its allied sectors for achieving sustainable growth and development for creating awareness among Programme Coordinators of KVKs. Dr.A.Gopalakrishnan, Director, CMFRI, Kochi gave away certificate of appreciation to the KVKs (Cuddalore, Thrissur, Bidar, Bengaluru Rural, Tumkur (UAS-B), Chikkaballapura, Namakkal, Mysore, Kannur, The Nilgiris, Erode, Ramanagaram, Gadag, Pathanamthitta, Virudhunagar and Dharmapuri) made impressive presentation. The workshop was concluded with formal vote of thanks by Dr. Sreenath Dixit.



**Release of publications during the Annual Review Workshop 2013-14 at CMFRI, Kochi**

### 1.6 Budget

A total of Rs. **6756.32** lakh was sanctioned for the year 2014-15 and 6753.93 lakh was incurred as

expenditure. Headwise details of budget and expenditure are furnished in Table 3.

**Table 3 : Headwise budget and expenditure of Zone VIII for 2014-15 (Rs. in Lakh)**

Heads	Sanction				Expenditure			
	ZPD	KVKs	Support to DEE at SAUs	Total	ZPD*	KVKs	Support to DEE at SAUs	Total
<b>(A) Recurring</b>								
Pay & Allowance	175.00	6111.00	0.00	6286.00	175.00	6111.00	0.00	6286.00
T.A	13.25	61.98	3.45	78.68	13.25	61.98	3.45	78.68
HRD	2.00	0.00	2.15	4.15	2.00	0.00	2.15	4.15
Contingencies	24.75	336.10	14.25	375.10	24.75	336.10	14.25	375.10
<b>Total</b>	<b>215.00</b>	<b>6509.08</b>	<b>19.85</b>	<b>6743.93</b>	<b>215.00</b>	<b>6509.08</b>	<b>19.85</b>	<b>6743.93</b>
<b>(B) Non Recurring</b>								
Works	0.00	10.00	0.00	10.00	0.00	10.00	0.00	10.00
Furniture & Equipment	2.39	0.00	0.00	2.39	0.00	0.00	0.00	0.00
Vehicle	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Library	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Revolving Fund	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>2.39</b>	<b>10.00</b>	<b>0.00</b>	<b>12.39</b>	<b>0.00</b>	<b>10.00</b>	<b>0.00</b>	<b>10.00</b>
<b>(C) Special Programmes</b>								
Soil Testing Labs	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Minimal Processing Units	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Rain Water Harvesting Units	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Portable Carp Hatchery	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Plant Diagnostic Centre	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
<b>Total</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>
<b>Grand Total (A+B+C)</b>	<b>217.39</b>	<b>6519.08</b>	<b>19.85</b>	<b>6756.32</b>	<b>215.00</b>	<b>6519.08</b>	<b>19.85</b>	<b>6753.93</b>

\*Rs.2.39 lakhs refunded to Council due to non-receipt of approval of EFC



## Chapter 2

### About Krishi Vigyan Kendras

KVKs are knowledge and resource centres of agriculture and its allied sectors, which aim at assessing and demonstration of location specific technological modules through technology assessment, refinement and demonstration. They are the agricultural knowledge centres for farmers, farmwomen, rural youth and extension functionaries. They perform mandated activities keeping their stakeholders as partners. At present, there are 642 KVKs in the country.

#### 2.1 Establishment of KVKs

Based on the recommendation of Education Commission (1964-66), consideration / review by Planning Commission and Inter-Ministerial Committee and further recommendation by a committee headed by Dr. Mohan Singh Mehta appointed by ICAR in 1973, the idea of establishment of Farm Science Centre (Krishi Vigyan Kendra) was evolved. Subsequently, the first KVK was established in 1974 at Puducherry

on pilot basis under the administrative control of Tamil Nadu Agricultural University, Coimbatore. The XI Five Year Plan envisaged establishing additional KVK in larger districts. Zone VIII had the privilege of establishing first additional KVK in Tumkur district, Karnataka under Indian Institute of Horticultural Research, Bengaluru.

The Zonal Project Directorate-Zone VIII, earlier known as Zonal Coordinating Unit-Zone VIII, started with establishing, monitoring and coordination of 8 KVKs during V Five Year Plan. During VI, VII, VIII, X and XI Five Year Plans, 7, 5, 20, 34 and 6 KVKs were established respectively. At present, there are 81 KVKs in the Zone under different host organizations viz., ICAR, SAUs, NGOs, DUs and State Department of Agriculture and functioning in Zone VIII. The state-wise and host organization-wise distribution is presented in Table 4.

**Table 4 : Distribution of KVKs - State and host organization-wise**

States	Host organizations					Total
	SAUs	NGOs	ICAR Research Institutes	DUs	SDA	
Karnataka	24	5	2	-	-	31
Tamil Nadu	17	11	-	2	-	30
Kerala	7	3	4	-	-	14
Goa	-	-	1	-	1	2
Puducherry	-	-	-	-	3	3
Lakshadweep	-	-	-	-	1	1
<b>TOTAL</b>	<b>48</b>	<b>19</b>	<b>7</b>	<b>2</b>	<b>5</b>	<b>81</b>

SAU - State Agricultural Universities, NGO - Non-Governmental Organizations, ICAR - Indian Council of Agricultural Research, DU- Deemed Universities, SDA- State Department of Agriculture



### 2.2 Mandate

Krishi Vigyan Kendras aim at technology assessment, refinement and demonstration of technology/products to cater the needs of farming community, extension personnel and other stakeholders in the district. In order to accomplish this, KVKs are carrying out the following activities:

- ❖ Conducting on-farm testing to identify the location specificity of agricultural technologies under various farming systems.
- ❖ Organizing frontline demonstrations to establish production potential of various crops and enterprises on the farmers' fields.
- ❖ Organizing need based training for farmers to update their knowledge and skills in modern agricultural technologies related to technology assessment, refinement and demonstration, and training of extension personnel to orient them in the frontier areas of technology development.
- ❖ Creating awareness about improved agricultural technologies among various

clienteles through appropriate extension programmes.

- ❖ Production of quality seeds, planting materials, livestock breeds, animal products, bio-products etc as per the demand and supply the same to different clienteles.
- ❖ Work as knowledge and resource centre of agricultural technology to support the initiatives of public, private and voluntary sectors for improving the agricultural economy of the district.

### 2.3 Manpower

The approved strength of manpower at each KVK is 16, which includes one Programme Coordinator, six Subject Matter Specialists, three Programme Assistants, two administrative staff, two drivers and two supporting staff. Accordingly, the total sanctioned staff for 81 KVKs of Zone VIII is 1296, out of which 1003 (78 %) are in position. Details of state-wise and category-wise staff strength of KVKs are furnished in Table 5.

**Table 5 : State-wise and category-wise staff strength of KVKs as on 31 March 2015**

Category	Karnataka (31)		Tamil Nadu (30)		Kerala (14)		Goa (2)		Puducherry (3)		Lakshadweep (1)		Total (81)	
	S	F	S	F	S	F	S	F	S	F	S	F	S	F
Programme Coordinator	31	29	30	24	14	10	2	1	3	1	1	0	81	65
Subject Matter Specialist	186	147	180	148	84	62	12	8	18	12	6	3	486	380
Programme Assistant	93	79	90	69	42	27	6	4	9	6	3	0	243	185
Administrative	62	42	60	48	28	21	4	3	6	2	2	2	162	118
Driver	62	47	60	54	28	18	4	3	6	4	2	0	162	126
Supporting	62	43	60	54	28	26	4	2	6	3	2	1	162	129
<b>Total</b>	<b>496</b>	<b>387</b>	<b>480</b>	<b>397</b>	<b>224</b>	<b>164</b>	<b>32</b>	<b>21</b>	<b>48</b>	<b>28</b>	<b>16</b>	<b>6</b>	<b>1296</b>	<b>1003</b>
<b>Percentage vacancy</b>	<b>21.97</b>		<b>17.29</b>		<b>26.78</b>		<b>34.37</b>		<b>41.67</b>		<b>62.5</b>		<b>22.11</b>	

S-Sanctioned      F-Filled      Figures in parenthesis is number of KVKs



### 2.4 Infrastructure at KVKs

Out of 81 KVKs in Zone VIII, 77 KVKs have administrative building, 94 KVKs have farmers' hostel and there are staff quarters in 54 KVKs, 150 demonstration units in 52 KVKs, 20 KVKs have established rain water harvesting units, 37

KVKs have e-connectivity, 67 KVKs have soil and water testing labs, 10 KVKs have portable carp hatchery, 4 KVKs have minimal processing units, 31 KVKs have plant health diagnostic labs. In the case of vehicles, 78 KVKs have jeep and 161 two wheelers.

**Table 6 : State wise details of infrastructure in KVKs**

Infrastructure	Karnataka (31)	Tamil Nadu (30)	Kerala (14)	Goa (2)	Puducherry (3)	Lakshadweep (1)	Total (81)
Administrative building	29	30	14	02	02	0	77
Farmers hostel	27	29	12	02	01	0	71
Staff quarters	19	25	09	01	0	0	54
Demo Units	41	70	27	08	04	0	150
Rainwater Harvesting Unit	10	03	06	01	0	0	20
E-Connectivity	11	14	10	01	01	0	37
Soil & Water Testing Lab	24	27	13	01	01	01	67
Portable Carp Hatchery	04	02	02	0	02	0	10
Minimal Processing Unit	01	01	02	0	0	0	4
Plant Health Diagnostic Lab	09	16	05	0	1	0	31
Jeep	31	30	13	02	02	0	78
Two Wheeler	63	60	28	02	05	03	161

*Figures in parenthesis is number of KVKs*

### 2.5 Scientific Advisory Committee

Scientific Advisory Committee (SAC) is the advisory body, which guides and reviews KVK activities. Head of host organization is the Chairman and other members include Zonal Project Director, Director of Extension, officials from all development departments of the district, representatives from SHGs and progressive farmers. SAC discusses the progress of work done as per mandate and provide guidance for future activities. A total of 41 SAC meetings were conducted by 40 KVKs, during the year.

### 2.6 Revolving Fund

Revolving Fund is in operation at 72 KVKs of the Zone VIII. The KVKs are utilizing revolving fund for production of technological products and the net balance as on March 31<sup>st</sup> 2015 was Rs.5.70 crores. During the reporting period, a net balance of more than Rs.20 lakh was there with eight KVKs. Another six KVKs have a balance in the range of Rs.10 to 20 lakh. Net balance ranged from Rs.4 to 10 lakh in 27 KVKs, Rs.1 to 3 lakh in 26 KVKs and less than Rs. one lakh in five KVKs.



## 2.7 Thrust Areas

As per the agro-ecological conditions and existing cropping & farming systems, KVKs are broadly working on the following identified thrust areas:

- Introduction and up-scaling of improved varieties/ hybrids of crops and livestock breeds through technical and quality input back-up
- Sustainable crop production through integrated nutrient management and organic farming strategies
- Integrated pest and disease management
- Development and promotion of crop diversification and alternate land use system
- Empowerment of women and youth in terms of improved nutrition, income generation and drudgery reduction through technological literacy
- Scientific management of dairy and small livestock
- Promotion of horticulture as a mechanism of crop diversification, augmenting family and national income
- Value addition, processing and market facilitation of household and commercial enterprises
- Soil, water conservation and watershed management for drought proofing and sustainable rainfed farming
- Small scale mechanization for saving time and reducing cost and drudgery
- Capacity building of rural youth and women to establish self-employment units
- Increasing income from fishery enterprises through production, processing and marketing



## Chapter 3 Achievements

### 3.1. Krishi Vigyana Kendras

#### 3.1.1. Technology Assessment and Refinement

Achievements under each of the major activities carried out by the KVKs are described in this section.

Technology assessment and refinement is one of the major activities mandated for Krishi Vigyan Kendras. It aims at development and dissemination of location specific technologies

evolved under National Agricultural Research System (NARS) through On Farm Trials (OFTs) based on participatory approach. OFTs are carried out involving the farming community, extension personnel and scientists. During the reporting year, a total of 343 technologies were assessed and nine technologies were refined by KVKs through 2034 On Farm Trials in 374 locations.

#### Technology Assessment and Refinement – an overview

- A total of 343 technologies were assessed and nine technologies were refined by KVKs through 2034 On Farm Trials in 374 locations. Of these, 91.95% of technologies were under crops and 5.74% under livestock, poultry and fisheries enterprises
- Under crops, technologies were assessed under Varietal Evaluation (125), Integrated Crop Management (42), Integrated Nutrient Management (32), Integrated Disease Management (31), Integrated Pest Management (30); followed by Cropping Systems and Integrated Pest and Disease Management (13 each)
- Crops in which technology assessment was taken up included paddy, groundnut, banana, chilli, redgram, onion, tomato, ragi and blackgram
- Under animal husbandry, areas of Production and Management (10), and Nutrition Management (05) were the major areas of technology assessment.

**3.1.1.1. Technology Assessment:** KVKs assessed 315 technologies in various crops through 1687 On Farm Trials under various thematic areas such as Cropping System (13), Drudgery Reduction (02); Farm Machinery (09); Integrated Crop Management (42); Integrated Disease Management (31), Integrated Nutrient Management (32), Integrated Farming System

(02); Integrated Pest Management (30), Integrated Pest and Disease Management (13), Processing and Value Addition (03), Resource Conservation Technologies (09), Storage Technique (01), Varietal Evaluation (125) and Weed Management (03). Details on number of trials and number of locations under each thematic area are presented in Table 7.

**Table 7 : Thematic area of technologies assessed under crops**

Thematic areas	Technologies (no.)	Trials (no.)	Locations (no)
Cropping system	13	79	16
Drudgery Reduction	02	15	02
Farm Machinery	09	43	10
Integrated Crop Management	42	212	43
Integrated Disease Management	31	170	34
Integrated Farming Systems	02	09	02
Integrated Nutrient Management	32	151	32
Integrated Pest Management	30	172	31
Integrated Pest and Disease Management	13	61	13
Processing and Value Addition	03	32	03
Resource Conservation Technology	09	39	09
Storage Techniques	01	05	01
Varietal Evaluation	125	684	133
Weed Management	03	15	03
<b>Total</b>	<b>315</b>	<b>1687</b>	<b>332</b>

From Table 8, it could be observed that 125 technologies were assessed through 647 trials in Karnataka followed by 119 technologies assessed through 681 trials in Tamil Nadu, 59 technologies

assessed through 306 trials in Kerala, 06 technologies assessed through 25 trials in Goa and 06 technologies assessed through 28 trials in Puducherry.

**Table 8 : Technology assessment under crops in different states of Zone VIII**

State	No. of technologies	No. of trials	No. of locations
Karnataka	125	647	134
Kerala	59	306	59
Tamil Nadu	119	681	127
Goa	06	25	06
Puducherry	06	28	06
<b>Total</b>	<b>315</b>	<b>1687</b>	<b>332</b>


**OFT in onion varieties in Gadag district**

**OFT on groundnut cultivation in Erode district**



**Assessment of groundnut varieties under rainfed condition in Kancheepuram district**

In the case of animal husbandry, poultry and fisheries, KVKs have assessed 20 technologies on four thematic areas including Disease Management (02); Evaluation of Breeds (03); Nutrition Management (05), and Production and Management (10) through 181 On Farm Trials and the details on number of trials and locations on each thematic area are presented in Table 9.

**Table 9: Thematic areas of technologies assessed under animal husbandry, poultry and fisheries**

Thematic areas	No. of technologies	No. of trials	No. of locations
Disease Management	02	90	02
Evaluation of breeds	03	17	03
Nutrition Management	05	21	05
Production and Management	10	53	10
<b>Total</b>	<b>20</b>	<b>181</b>	<b>20</b>

Data in Table 10, reveal that in livestock, poultry and fisheries sectors, 07 technologies were assessed through 100 trials in Kerala followed by

07 technologies assessed through 45 in Tamil Nadu, and 06 technologies assessed through 36 trials in Karnataka.

**Table 10 : State-wise Technology Assessment under animal husbandry, poultry and fisheries**

State	No. of technologies	No. of trials	No. of locations
Karnataka	06	36	06
Kerala	07	100	07
Tamil Nadu	07	45	07
<b>Total</b>	<b>20</b>	<b>181</b>	<b>20</b>



**Management of mastitis disease through ethno medicine in Kancheepuram district**

In the case of technologies assessed for empowerment of rural women, eight technologies were assessed under four thematic areas viz., Child Nutrition (01), Processing and Value Addition (01); Production and Management (02), and Small Scale Income Generation (04) through a total of 129 On Farm Trials and the details on number of trials and locations on each thematic area are presented in Table 11.

**Table 11 : Thematic areas of technologies assessed for empowerment of rural women**

State	No. of technologies	No. of trials	No. of locations
Child Nutrition	01	85	04
Processing and Value Addition	01	02	01
Production and Management	02	25	03
Small Scale Income Generation	04	17	04
<b>Total</b>	<b>8</b>	<b>129</b>	<b>12</b>

Table 12, shows that in the case of Empowerment of Rural Women, three technologies were assessed through 14 trials in Kerala followed and 02 technologies were assessed through in 105

trials in Karnataka. Two technologies were assessed through seven trials in Tamil Nadu and one technology was assessed through three trials in Goa.

**Table 12 : State wise technologies assessed for empowerment of rural women**

State	No. of technologies	No. of trials	No. of locations
Karnataka	02	105	06
Kerala	03	14	03
Tamil Nadu	02	07	02
Goa	01	03	01
<b>Total</b>	<b>8</b>	<b>129</b>	<b>12</b>

**3.1.1.2. Refinement:** During the year, KVKs refined 09 technologies through 37 On Farm Trials on various thematic areas such as Cropping System (01), Drudgery Reduction for Women (01), Farm Machineries (03), Resource

Conservation Technology (02) and Seed/Planting Material Production (02). Details on number of trials and locations under each thematic area are presented in Table 13.

**Table 13 : Thematic area wise technologies refined under crops**

Thematic areas	No. of technologies	No. of trials	No. of locations
Cropping Systems	01	05	01
Drudgery Reduction for Women	01	05	01
Farm Machineries	03	07	04
Resource Conservation Technology	02	10	02
Seeds and Planting Material Production	02	10	02
<b>Total</b>	<b>09</b>	<b>37</b>	<b>10</b>

Under crops, five technologies were refined through 20 trials in Kerala, two technologies each were refined through 10 trials in Karnataka and technologies refined seven trials in Tamil Nadu (Table 14).

**Table 14 : State-wise Technology refinement under crops**

State	No. of technologies	No. of trials	No. of locations
Karnataka	02	10	02
Kerala	05	20	06
Tamil Nadu	02	07	02
<b>Total</b>	<b>09</b>	<b>37</b>	<b>10</b>

### 3.1.3. Location specificity of the technologies

#### (A) Varietal Evaluation

#### Assessment of salinity tolerant paddy varieties in South Interior Karnataka

Paddy is a major cereal crop of Karnataka, cultivated in an area of 10.48 lakh ha, and the average productivity is 2.68 t/ha. Mandya and Chamrajnagar are the two major paddy growing districts in South Interior Karnataka with an area of 47709 ha and 6871 ha respectively. The average productivity of the crop is 3.27 tons/ha and 3.58 tons/ha respectively under normal soils, whereas in salt affected soils, yield is reduced upto 60% of the normal yield. In order to overcome this problem, during the period under report, KVKs Chamrajnagar and Mandya assessed the performance of salt tolerant paddy varieties viz., IR 30864, Vikas and Gangavati.

The results indicated that in Chamrajnagar district, as compared to IR-64 (43.80 q/ha), yield was highest in Gangavati (54.00 q/ha), followed by Vikas (50.2 q/ha) and IR-30864 (48.90 q/ha). The BCR was also highest for Gangavati (2.07) followed by Vikas (1.85) and lowest in IR-64 (1.68). In Mandya district, Gangavati (56.23 q/ha; 2.40) gave the highest yield and BCR followed by IR-30864 (53.60 q/ha; 2.25) and Vikas (50.30 q/ha; 2.15).

#### Assessment of sorghum varieties in Northern Karnataka

Sorghum is the predominant millet crop of Karnataka, cultivated in an area of 15.80 lakh ha and the average state yield is about 1.29 t/ha. The crop is mostly cultivated under rainfed conditions by small and marginal farmers. Cv. SPV2217 is



**Assessment of saline tolerant paddy varieties in Mandya district**



**Assessment of sorghum varieties in Belgaum district.**

an high yielding variety of sorghum which was tested for its performance by KVK Belgaum-I and Gadag. It was observed that In Belgaum-I district, as compared to M-35-1 (11.56 q/ha), the realized yield was higher in cv. SPV 2217 (13.35 q/ha), The BCR was also higher for SPV 2217 (2.86) as compared to cv. MS-35-1(2.48). In Gadag district, SPV 2217 (21.56 q/ha; 2.26) gave the better yield and BCR followed by CSV-22 (18.52 q/ha; 2.10) and MS-35-1 (16.74 q/ha, 2.01).

### **Assessment of paddy varieties tolerant for bacterial leaf blight in Tamil Nadu**

Paddy is the major food crop cultivated in an area of 14.90 lakh ha and the average productivity of the crop is 2.71 tons/ha. Bacterial Leaf Blight (BLB) disease is a major problem in Vellore, Dharmapuri and Nagappatinam districts of the state. In order to overcome this problem, Tamil Nadu Agricultural University has provided technological backstopping through KVKs and as a part of this process; the KVKs located in these three districts have assessed the performance of ADT 49 and Improved Sambha Mashuri.

The results indicated that in Vellore district the yield and BCR was higher in Improved Sambha Mashuri (60.80 q/ha; 2.18) as compared to ADT 49 (57.30 q/ha; 1.81) and BPT 5204 (49.40 q/ha; 1.97). However in Dharmapuri and Nagappatinam districts, ADT 49 performed better than other two varieties. In Dharmapuri district, the Yield and BCR of ADT 49 was 50.40 q/ha and 1.80 respectively and that of Improved Sambha Mashuri was 36.20 q/ha and 1.30; in BPT-5204, the realized yield was 35.0 q/ha and BCR was 1.00. In Nagappatinam district, the realized Yield and BCR for ADT 49 was 51.60 q/ha and 1.82 respectively, and that of Improved Sambha Mashuri was 36.00 q/ha and 1.29; in BPT-5204 the realized yield was 35.6 q/ha and BCR was 1.22.

However, in all the three districts, the incidence of BLB was maximum in BPT 5204 (26.00 to 38.40 %), followed by ADT 49 (14.20 to 15.60 %) and the same was the least in Improved Sambha Mashuri (5%).

### **Assessment of tuberose varieties for higher yield and income in Tamil Nadu**

Tuberose (*Polianthes tuberosa*) is an upcoming flower crop in Tamil Nadu, which has



**Assessment of varieties tolerant for Bacterial Leaf Blight of paddy in Dharmapuri district**



**Assessment of tuberose varieties in Thiruvarur district.**

consistent market demand throughout the year. KVKs Thiruvallur and Thiruvarur performed technology assessment on high yielding tuberose varieties viz., Arka Prajwal and Phule Rajini during the period under report. It was observed that the yield and BCR was higher for Arka Prajwal in both the districts (80.38 q/ha; 2.74 in Thiruvallur, 152.40 q/ha; 4.15 in Thiruvarur) as compared to Phule Rajini (50.69 q/ha; 1.68 in Thiruvallur, 136.70 q/ha; 3.52 in Thiruvarur) and Local variety (71.07 q/ha; 2.27 in Thiruvallur, 106.30 q/ha; 3.31 in Thiruvarur).

### **Assessment of chilli hybrids for higher yield and income in Tamil Nadu**

Chilli is a major vegetable crop widely cultivated in Tamil Nadu. The crop is cultivated in



**Assessment of chilli hybrids  
in Dharmapuri district**

an area of 47110 ha with an annual production of 17950 tons with an average productivity of 0.38 tons/ha. In order to improve the productivity level of the crop, hybrids viz., Co (ch) – 1, KBCH-1 and Arka Meghana were released from National Agricultural Research System and their performance was assessed by KVKs Dharmapuri, Shivagangai and Villupuram in Tamil Nadu.

it was observed in Dharmapuri district, that in terms of yield and BCR, as compared to Arka Meghana (228.40 q/ha; 1.91), and KBCH-1 (227.50 q/ha; 1.94); Co(ch)-1 performed better (248.70 q/ha; 2.02). Similar results were also obtained from Shivagangai and Villupuram districts. In Shivagangai district, Co(ch)-1 (149.00 q/ha; 3.19) out yielded Arka Harita (138 q/ha; 2.64) and in Villupuram district Co(ch)-1 (236.40 q/ha; 2.84) realized better yield and BCR as compared to Arka Meghana (214.20 q/ha; 3.25)

### **(B) Integrated Disease Management**

#### **Management of late blight disease in potato in South Interior Karnataka**

Potato is a major tuber crop cultivated in South Interior Karnataka especially in Hassan, Bengaluru Rural, Chickaballapura and Koiar



**Management of late blight of potato  
in Bengaluru Rural district**

districts. Late blight of Potato is a major disease affecting the crop during the kharif season and severe its infestation could result in yield and economic loss upto 60%. Realizing this, KVKs Bengaluru Rural, Chickaballapura and Kolar have assessed the Integrated Disease Management techniques for management of late blight of potato.

Based on On Farm Testing, It was observed that Soil application of *Trichoderma* and *Pseudomonas* as prophylactic measure and spraying of Mancozeb (0.2%) followed by spraying of Fenamidone + mancozeb(0.3%) gave better yield and disease reduction and realized better BCR in all the three districts. The respective yield; disease reduction and BCR was 245.50 q/ha; 31% and 3.16 in Bengaluru Rural district, 242.00 q/ha; 15.10% and 3.31 in Chickaballapura and 240.32 q/ha; 13.80% and 1.56 in Kolar district. The respective figures for prophylactic spray of Mancozeb (0.2%) 2 times , Dimethomorph (0.1%)+ Mancozeb (0.2%) followed by Cymoxanil + Mancozeb (0.3%) was 223.60 q/ha; 7.20% and 2.77 in Bengaluru Rural district, 222.90 q/ha; 8.30% and 2.96 in Chickaballapura and 210.04 q/ha; 6.80% and 1.38 in Kolar district.

### 3.1.2. Frontline Demonstrations

Frontline demonstrations (FLDs) on crops and allied agriculture activities were conducted to demonstrate the production potential of newly released crop varieties, resource conservation technologies, crop production technologies, improved technologies in livestock and fisheries and other allied activities. During the year, 9068 frontline demonstrations were conducted including 1359 on cereals, 486 on millets, 444 on oilseeds, 540 on pulses, 189 on commercial crops, 285 on fodder crops, 790 on vegetable crops, 194 on tuber crops, 473 on fruit crops, 186 on flowers and aromatic crops, 398 on spice crops

and 145 on plantation crops. Besides, 419 demonstrations on special pulses were conducted in the NFSM implementing districts of Karnataka and Tamil Nadu. KVKs also conducted 889 demonstrations on hybrids of various crops, 121 on farm implements, 1359 on livestock and fisheries and 791 on enterprises covering an area of 2388.17 ha in the states of Karnataka, Tamil Nadu, Kerala, Goa and Puducherry. Apart from this, 1171 demonstrations on crops and 228 demonstrations on livestock were at different stages of implementation at the time compilation of results in the KVKs of Karnataka, Tamil Nadu, Kerala, Goa and Puducherry (Table 15).

**Table: 15 Details of Frontline demonstrations conducted during 2014-15**

Crop Category	No. of farmers	Area (ha)
Cereals	1359	474.44
Millets	486	202.28
Oilseeds	444	160.00
Pulses	540	207.9
Commercial and fibre crops	189	74
Fodder Crops	285	73.5
Vegetable crops	790	223.5
Tuber crops	194	41.42
Fruit crops	473	153.6
Flowers and Aromatic crops	186	59.05
Plantation crops	145	110
Spices	398	94.2
Special pulses programmer	419	171.20
Hybrids of various crops	889	301.28
Farm implements	121	41.8
Livestock, fisheries, sheep & goat, piggery	1359	
Other enterprises	791	
<b>Total</b>	<b>9068</b>	<b>2388.17</b>
Demonstrations under progress in crops	1171	425.14
Demonstrations under progress in livestock	228	-
<b>Grand Total</b>	<b>10467</b>	<b>2813.31</b>



**Cereals:** A total of 1359 demonstrations were conducted in various cereals covering an area of 474.44 ha during the year by the KVKs of Zone-VIII. The state wise and KVK wise results are as under:

**Karnataka:** A total of 469 demonstrations in cereals such as paddy, wheat, maize, and sorghum were conducted covering an area of 192 ha in the farmers' fields during the year (Table 16). The technologies such as ICM, IPM, IPDM, variety introduction, cropping systems, farm mechanization, weed management, problematic soil management and water saving technologies in paddy resulted in the increased yield of paddy

by 13.88 % as compared to farmers' practice. In wheat, demonstration of ICM and new variety cv. UAS-304 resulted in yield increase to the extent of 25.84 % as compared to farmers' practice. Similarly in maize, ICM and intercropping technologies have yielded better than the farmers' practice by recording an increase of 10.77% practice and in sorghum technologies such as variety introduction, ICM and cropping systems have enhanced the yield up to 27.17 % over farmers' practice. The BCR was higher in all the technology demonstrations as compared to that in farmers' practice.

**Table: 16 Frontline demonstrations conducted by KVKs of Karnataka on cereals**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Paddy</b>									
Dryland Farming	Tumkur	MAS 26	5	2	36.3	32.1	13.08	1.71	1.20
Integrated Crop Management	Koppal	BPT-5204	10	4	77.7	73.5	5.71	2.34	1.98
Integrated Crop Management	Uttara Kannada	Abhilash	6	4	82.66	64.8	27.56	2.93	2.46
Integrated Crop Management	Davangere	Bpt Sona	20	8	58.6	56	4.64	2.03	1.77
Integrated Crop Management	Kalaburagi	Gangavati Sona	5	2	58.15	52.45	10.87	2.12	1.66
Integrated Crop Management	Tumkur	IR-64	10	4	55	43	27.91	1.55	1.48
Integrated Crop Management	Davangere	JGL	15	6	63.1	55.12	14.48	2.38	1.98
Integrated Crop Management	Belagavi	MGD-101	10	4	29.7	24.5	21.22	1.83	1.61
Integrated Crop Management	Dakshina Kannada	MO4	10	4	40.82	35.6	14.66	1.57	1.43
Integrated Crop Management	Dharwad	Mugadsiri	10	4	41.4	35.95	15.16	1.78	1.62
Integrated Crop Management	Chikkamagalur	Tunga	12	4.8	38.9	35.33	10.10	1.26	1.25
Integrated Nutrient Management	Udupi	MO-4	10	4	38	34.5	10.14	2.03	1.97

Contd.....

**Table 16 : Frontline demonstrations conducted by KVKs of Karnataka on cereals**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
Integrated Nutrient Management	Shimoga	JGL 1798, MTU 1010, Jyothi	14	2.8	59.77	58.66	1.89	2.75	2.74
Integrated Nutrient Management	Hassan	Rajmudi	10	4	57.13	54.51	4.81	2.30	2.37
Nutrient management	Udupi	K-6	10	4	26	25.1	3.59	4.67	4.60
Integrated Pest and Disease Management	Mandya	BR-2650	9	4	47.66	38.33	24.34	2.81	2.58
Integrated Pest Management	Koppal	BPT-5204	10	4	52	41.6	25.00	1.76	1.32
Integrated Pest Management	Shimoga	JGL-1798	12	5	55.25	47.42	16.51	1.94	1.45
Integrated weed Management	Chikkamagalur	Tunga	10	4	37	35.3	4.82	1.28	1.24
Farm Mechanization	Dakshina Kannada	Jaya	8	4	35.7	30.5	17.05	1.59	1.16
Farm Mechanization	Udupi	MO-4	9	4	44	38.5	14.29	2.78	2.12
Farm Mechanization	Uttara Kannada	Sindhu, Gantasala, Halaga & Rajamudi	6	4	55	43	27.91	2.56	1.77
Mechanization	Bellary	BPT-5204	10	4	72	67.5	6.67	4.11	3.00
Integrated Disease Management	Bellary	BPT-5204	10	4	67.89	52.08	30.36	3.75	2.66
Reclamation of acid soils	Chikkamagalur	IET-sanna	5	2	42.5	37.5	13.33	1.38	1.24
Resource Conservation Technologies	Udupi	MO-4	9	4	40	37.5	6.67	2.20	2.14
Resource Conservation Technologies	Mysore	MTU 1001	10	4	47.36	43.54	8.77	1.86	1.77
Varietal introduction	Uttara Kannada	KMP 105	11	5.2	61.8	55.6	11.15	2.69	2.56
			<b>276</b>	<b>113.8</b>	<b>51.50</b>	<b>45.34</b>	<b>13.88</b>	<b>2.30</b>	<b>1.98</b>



**FLD on UAS-304 variety of wheat at Gadag district**



**Table 16 : Frontline demonstrations conducted by KVKs of Karnataka on cereals (Contd.)**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Wheat</b>									
Integrated Crop Management	Kalaburgi	DWR-162	2	0.8	28.56	24.15	18.26	2.44	1.67
Integrated Crop Management	Gadag	UAS-304	5	2	31.42	27.1	15.94	1.92	1.75
Integrated Crop Management	Vijayapura	DDK-1029	15	6	26.4	22.17	19.08	3.30	2.82
Integrated Crop Management	Vijayapura	UAS-304	15	6	34.97	25.77	35.70	4.45	3.42
Variety Introduction	Bagalkot	UAS-304	12	5	34.73	30.1	15.38	3.91	3.41
			<b>49</b>	<b>19.8</b>	<b>31.69</b>	<b>25.84</b>	<b>22.83</b>	<b>3.63</b>	<b>2.99</b>
<b>Maize</b>									
Integrated Crop Management	Davangere	BRG-2	13	5.2	57	50.1	13.77	2.19	1.87
Integrated Crop Management	Chitradurga	BRG-2	10	4	84.8	69.1	22.72	2.48	2.04
Integrated Crop Management	Uttara Kannada	CP818, NK 6240	10	4	76.39	61.93	23.35	2.77	2.33
Integrated Crop Management	Chamrajanagar	NAH-1137	12	5.2	50.5	47	7.45	2.44	2.35
Intercropping -Maize + Pigeon pea	Shimoga	BRG-4	12	5	52.3	54.6	-4.21	2.24	1.09
Seed production	Mysore	Africal Tall	5	2	29.5			2.27	1.52
			<b>62</b>	<b>25.4</b>	<b>60.01</b>	<b>51.26</b>	<b>10.77</b>	<b>2.40</b>	<b>1.89</b>
<b>Sorghum</b>									
Cropping Systems	Chamrajanagar	CSH-14	10	4	16.2	9.5	70.52	1.36	1.11
Integrated Crop Management	Kalaburgi	JP-1	12	5	14.58	12.4	17.58	7.97	7.35
Integrated Crop Management	Kalaburgi	JP1-5	10	4	23.14	17.22	34.38	3.81	2.84
Variety Introduction	Bagalkot	BJV-44	25	10	22.12	18.66	18.54	3.77	3.18
Irrigation management	Bellary	M-35-1	10	4	9.05	7.77	16.47	2.19	1.61
Cropping Systems	Vijayapura	M35-1/N-53	15	6	23.94	12.15	22.94	3.02	2.36
			<b>82</b>	<b>33</b>	<b>19.13</b>	<b>13.92</b>	<b>27.17</b>	<b>3.79</b>	<b>3.18</b>
State Total			469	192					

**Goa:** Technologies such as management of problematic soils, natural resource conservation technology and new variety were demonstrated in 10.2 ha area of paddy in 32 farmers' fields during

the year (Table 17). The increase in yield was 67.73% due to technology demonstration as compared to farmers' practice.

**Table 17 : Frontline Demonstrations conducted by KVKs of Goa on cereals**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Average Yield(q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Cereals</b>									
Problematic Soil Management	South Goa	Karjat - 3	2	0.2	46.5	43	8.14	1.98	1.83
Resource conservation technology	North Goa	Makkam	15	5	70.6	47.6	48.32	3.47	2.50
Variety evaluation		Naveen	15	5	65.7	44	49.32	2.89	2.30
State Total			32	10.2	32	10.2	67.73	3.16	2.39



**Tamil Nadu:** A total of 558 demonstrations in cereals such as paddy and sorghum were conducted covering an area of 203.4 ha in the farmers' fields during the year (Table 18). The technologies such as ICM, IPM, IPDM, variety introduction, cropping systems, farm mechanization, weed management, problematic soil management, seed production and water

saving technology in paddy have given 21.14% increased yield of paddy as compared to farmers' practice. In sorghum, demonstration of cv. Co-30 resulted in yield increase to the extent of 41.03 % as compared to farmers' practice. The BCR was higher in all the technology demonstrations as compared to farmers' practice.

**Table 18 : Frontline demonstrations on cereals conducted in the state of Tamil Nadu**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Paddy</b>									
Cropping Systems	Trichy	Co51	10	4	63.08	53.7	17.47	1.22	1.56
Variety evaluation	Villupuram	Co 51	15	6	64.1	44.1	45.35	2.62	1.85
Farm Mechanization	Pudukottai	Co 51	10	4	65.8	57.7	14.04	4.94	2.04
Integrated Crop Management	Kancheepuram	Co-51	20	8	82	72	13.89	3.61	2.69
Integrated Crop Management	Dharmapuri	Co 51	10	4	49.2	34.24	43.69	2.09	1.68
Integrated Crop Management	Thiruvannamalai	Co51	10	4	61.43	49.9	23.11	2.13	1.49
Integrated Crop Management	Thiruvallur	Co 51	10	2	70.52	48.09	46.64	2.89	2.38
Varietal demonstration	Shivagangai	Co-51	11	4	55	44	25.00	2.28	1.71
Variety demonstration	Cuddalore	Co 51	10	2.4	54.73	49.75	10.01	2.44	2.17
Variety Introduction	Ramanathapuram	Co 51	25	10	4217	41.25	2.23	3.44	3.23
Variety Introduction	Madurai	Co51	10	4	61	56	8.93	1.46	1.23
Variety Introduction	Nagapattinam	Co 51	10	4	45	40	12.50	1.97	1.62
Variety Introduction	Thiruvallur	Co 51	10	2	62.45	47.84	30.54	2.95	2.55
Integrated Disease Management	Thiruvannamalai	Co 51	10	4	62.65	52.04	20.39	2.00	1.62
Variety evaluation	Ariyalur	Co 50	10	4	60.46	49.62	21.85	2.14	1.74
Integrated Crop Management	Karur	BPT 5204	10	5	49.35	41.75	18.20	1.81	1.47
Integrated Crop Management	Nagapattinam	CR1009	10	4	48.2	40.6	18.72	1.77	1.56
Integrated Crop Management	Thiruvallur	Local	20		54.01	45.67	11.72	1.70	1.59
Integrated Crop Management	Thiruvannamalai	TMV13	10	4	26.13	20.91	24.96	2.49	1.95
Integrated Crop Management	Theni	TPS 5	10	4	78.12	60.53	29.06	2.40	1.84
Integrated Crop Management	Trichy	BPT 5204	15	6	61.84	53.57	15.44	2.63	2.16
Integrated Disease Management	Salem	BPT 5204	10	2	59.1	52.6	12.36	2.43	2.05
Integrated Disease Management	Nagapattinam	BPT 5205	10	4	43.4	38.2	13.61	1.81	1.13
Integrated Disease Management	Pudukottai	BPT5204	10	4	59.85	51.2	16.89	2.59	2.03
Integrated Disease Management	Trichy	BPT-5204	10	4	62.85	51.3	22.51	2.25	1.86
Integrated Disease Management	Tiruvarur	CR 1009,BPT 5204	10	4	51.2	44.4	15.32	2.02	1.43
Integrated Pest and Disease Management	Karur	BPT 5205	10	4	47.11	41.27	14.15	2.27	1.78
Integrated Pest and Disease Management	Ariyalur	CR 1009	10	4	55.6	44.64	24.55	2.03	1.62

Contd.....

Thematic Area	KVK	Name of Variety	No. of farms	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
Integrated Crop Management	Kancheepuram	ADT- 45	12	5	61.5	53.65	14.63	2.55	1.67
Integrated Pest Management	Villupuram	ADT(R) 49	10	1	55.16	51.37	7.38	2.59	1.41
Integrated Pest Management	Dindigul	ADT 46	10	4	48.74	38.65	26.11	1.42	1.18
Integrated Pest Management	Salem	ADT 50	10	4	50.4	38.3	31.59	1.92	1.49
Integrated Pest Management	Nagapattinam	BPT 5204	10	4	45.2	36.2	24.86	1.66	1.13
Crop Management	Cuddalore	Anna 4	10	4	40.79	37.51	8.74	2.23	2.04
Integrated Crop Management	Virudhunagar	Anna 4	10	4	37.85	21.55	75.64	3.77	2.83
Irrigation Management	Madurai	Anna 4	10	4	53	48	10.42	1.15	1.06
Seed Production	Cuddalore	Anna 4	10	2	43.3	36.8	17.66	1.65	1.83
Variety Introduction	Nagapattinam	ANNA4	20	8	37	31.88	16.06	1.82	1.56
Total Mechanization	Tuticorin	ASD – 16	10	4	63.16	51.15	23.48	1.96	1.44
Variety demonstration	Cuddalore	TRY 3	10	4	57.64	47.25	21.99	2.46	2.12
Variety Introduction	Thiruvallur	TRY 3	20	8	58.5	43.54	34.36	2.64	2.27
Variety Introduction	Nagapattinam	TRY3	10	4	55.2	45.6	21.05	1.31	1.18
Variety Introduction	Ramanathapuram	Co (R) 51 & ADT 45	10	4	43.4	39.5	9.87	2.72	2.50
Variety Introduction	Nagapattinam	CR 1009 Sub 1	20	8	53.75	48.75	10.26	1.95	1.76
Integrated Pest Management	Tiruvarur	CR 1009 Sub 1	10	4	50.8	36.2	40.33	1.79	1.18
Variety Introduction	Kanyakumari	TPS 5	10	4	70.1	56.5	24.07	2.69	2.22
Variety Introduction	Tiruvarur	TPS-5	10	4	69.05	57.28	20.55	1.77	1.43
			<b>548</b>	<b>199.4</b>	<b>54.99</b>	<b>45.75</b>	<b>21.14</b>	<b>2.32</b>	<b>1.85</b>
<b>Sorghum</b>									
Variety introduction	Virudhunagar	Co30	10	4	24.75	17.55	41.03	2.72	2.30
		<b>State Total</b>	<b>558</b>	<b>203.4</b>					

**Puducherry:** A total of 40 demonstrations on paddy mechanization, variety introduction, seed production and IDM technologies covering an area of 16 ha have recorded 11.42% increase in

yield as compared to farmers, practice during the year (Table 19). The BCR was higher in all the technologies as against farmers' practice.



**FLD on paddy variety at Theni district**

**Table 19 : Frontline demonstrations on cereals conducted in the state of Puducherry**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	BCR	
					Demo	Check		Demo	Check
<b>Paddy</b>									
Farm Mechanization	Karaikal	Savithiri, BPT 5204, ADT( R)-46	10	4	35.48	30.94	14.67	1.58	1.16
Integrated Disease Management	Karaikal	ADT-49,BPT 5204	10	4	39.1	38.85	0.64	1.62	1.49
Varietal Introduction	Karaikal	ADT (R )-50, BPT 5204	10	4	44.64	33.48	33.33	1.44	1.25
Seed Production	Karaikal	Ponni	10	4	25.05	0		1.44	
<b>State Total</b>			<b>40</b>	<b>16</b>	<b>36.07</b>	<b>25.82</b>	<b>11.42</b>	<b>1.52</b>	<b>0.97</b>

**Kerala:** A total of 260 demonstrations in cereals particularly in paddy were conducted covering an area of 56.84 ha in the farmers' fields during the year (Table 20). The technologies such as ICM, IPM, IPDM, variety introduction, seed production, cropping systems, farm mechanization, weed management,

problematic soil management and water saving technologies in paddy gave 37.97 % higher yield as compared to farmers' practice. The BCR was higher in all the technology demonstrations as compared to farmers' practice.



**FLD on mechanized paddy transplanting at Trivandrum district**

**Table 20: Frontline demonstrations on cereals conducted in the state of Kerala**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio (Rs/ha)	
					Demo	Check		Demo	Check
<b>Cereals</b>									
Integrated Disease Management	Kasaragod	Uma	10	4	46	32	43.75	1.39	1.14
Integrated Nutrient Management	Kasaragod	Uma	10	4	46	32	43.75	1.14	1.43
Integrated Weed Management	Malappuram	Uma	10	2	57.8	48.1	20.17	2.21	1.23
Cropping Systems	Ernakulam	Uma	3	0.5	44.3	38.2	15.97	1.21	1.10
Farm Mechanization	Kottayam	Uma	10	0.04	35	29	20.69	1.47	1.31
Farm Mechanization	Palghat	Uma	12	9.5	54	48	12.50	1.63	1.07
Integrated Crop Management	Ernakulam	Uma	1	1	50	40	25.00	1.18	1.03
Integrated Nutrient Management	Alleppey	Uma	10	5	55.1	47.9	15.03	1.49	1.30
Integrated Weed Management	Pathanamthitta	Uma	10	2	43	41	4.88	1.32	1.23
Mechanization	Trivandrum	Uma	3	6	65	53.3	21.95	1.47	1.23
Problematic Soil Management	Kottayam	Uma	10	0.4	47.5	37	28.38	1.95	1.42
Seed production	Trivandrum	Uma	3	1	65	53.33	21.88	1.49	3.04
Weed Management	Palghat	Uma	15	3	66	50	32.00	1.79	1.47
Weed Management	Palghat	Uma	12	3	65	49	32.65	1.76	1.29
Integrated Disease Management	Palghat	Jothi, Uma	24	1.5	35	29	20.69	2.30	1.64
Integrated Pest Management	Palghat	Jothi, Uma	87	7.9	37	30	23.33	2.38	1.60
Variety Introduction	Kozhikode	Vaishakh	10	1	21	18.5	13.51	1.62	1.36
Integrated Crop Management	Kannur	Athira	5	0.5	62.5	32.5	92.31	2.38	1.31
Integrated Pest Management	Wynad	Athira	5	0.5	47.12	42.95	9.71	1.59	1.43
Integrated Crop Management	Wynad	Athira	10	4	54.5	39.5	37.97	2.01	1.53
<b>State Total</b>			<b>260</b>	<b>56.84</b>	<b>51.68</b>	<b>41.69</b>	<b>24.96</b>	<b>1.72</b>	<b>1.35</b>

**Millets:** A total of 486 demonstrations were undertaken in millets by the KVKs of Karnataka and Tamil Nadu states covering an area of 202.8 ha during the year. The State wise and KVK wise results are as under:

**Karnataka:** A total of 280 demonstrations in millets such as finger millets, little millet and foxtail millet were under taken in 120.8 ha area of farmers' fields by the KVKs of Karnataka during the year (Table 21). The technologies such as

drought management, new varieties introduction, ICM, mechanization in finger millet gave 15.46% increase in yield as compared to farmers' practice. Similarly in little millet, ICM, INM and processing and value addition gave 51.25% increased yield with higher BCR of 2.39 as against 1.76 in farmers' practice. The foxtail millet demonstrations on crop management and new varieties yielded better with BCR of 2.80 as compared to 2.19 under check fields.



**Table 21: Frontline demonstrations on millets conducted in the state of Karnataka**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Average Yield(q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Finger millet</b>									
Drought management	Hassan	ML-365	10	4	35	31.5	11.11	3.35	3.24
Dryland farming	Mysore	GPU 67	8	3.2	20.45	16.25	25.85	2.21	1.57
Dryland farming	Tumkur	ML 365	5	3	26.44	19.4	36.29	1.94	1.60
Variety Introduction	Chitradurga	ML-365	10	4	28.5	23.6	20.76	2.85	2.46
Crop Management	Shimoga	ML-365	10	4	12	13	-7.69	1.31	1.39
Integrated Crop Management	Tumkur	KMR- 301	25	10	26.5	20.75	27.71	1.71	1.60
Integrated Crop Management	Bengaluru Rural	ML-365	25	10	24.24	21.01	15.37	2.02	1.82
Integrated Crop Management	Chikkamagalur	ML-365	24	9.6	16.12	14.27	12.96	1.65	1.48
Integrated Disease Management	Ramanagaram	KMR 301	15	6	29.81	32.31	-7.74	2.61	2.78
Mechanization	Ramanagaram	ML 365	9	5	24.5	22	11.36	2.56	1.47
Variety Introduction	Kolar	KMR 301	10	4	27.36	20.75	31.86	1.82	1.55
Variety Introduction	Chikkaballapur	KMR-301	12	4.8	4.25	3.75	13.33	1.28	0.94
			<b>163</b>	<b>67.6</b>	<b>22.78</b>	<b>19.85</b>	<b>15.46</b>	<b>2.04</b>	<b>1.80</b>
<b>Little millet</b>									
Integrated Crop Management	Davangere	KMR-301	25	10	25.7	15.3	67.97	2.67	1.61
Integrated Nutrient Management	Tumkur		12	4	12	10.1	18.81	2.37	2.20
Processing and Value Addition	Mysore	OLM 303	3	1.2	12	10	20.00	0.21	1.60
			<b>40</b>	<b>15.2</b>	<b>21.01</b>	<b>13.51</b>	<b>51.25</b>	<b>2.39</b>	<b>1.76</b>
<b>Foxtail millet</b>									
Crop Diversification	Bidar	HMT-100-1	10	10	4.25	3.5	21.43	2.62	2.43
Integrated Crop Management	Belagavi	PS-4	25	10	10.97	6.1	79.84	2.68	1.53
Integrated Crop Management	Kalaburagi	SIA-2644	12	5	15.79	13.84	14.09	2.30	2.08
Integrated Crop Management	Mandya	Sia-3156	10	5	8.95	8.01	11.74	2.56	2.46
Variety Introduction	Kalaburagi	HMT100-1	10	4	11.59	9.45	22.65	2.32	1.65
Variety Introduction	Koppal	SIA-2644	10	4	12.7	9.88	28.54	4.99	3.58
			<b>77</b>	<b>38</b>	<b>9.82</b>	<b>7.44</b>	<b>35.43</b>	<b>2.80</b>	<b>2.19</b>
		<b>State Total</b>	<b>280</b>	<b>120.8</b>					

**Tamil Nadu:** A total of 206 demonstrations on major millets such as finger millet, bajra, barnyard millet, little millet and foxtail millet in an area of 82 ha of farmers' fields in the Tamil

Nadu state were conducted by the KVKs during the year (Table 22). In finger millet, dry farming technology demonstration, ICM, new cv. Co-15 have recorded 38.66% higher yield as compared



to their checks. In bajra, the BCR was also very encouraging with technology demonstrations as compared to farmers' practice. In foxtail millet, dry farming, ICM and Co-15 variety introduction recorded higher yield as compared to farmers' practice with higher BCR of 2.51. Cv. Co-4 in little millet along with ICM recorded higher yield

to the extent of 40.02% as compared to farmers' practice. The barnyard and foxtail millets also recorded higher yield to the extent of 35.48% and 27.98% respectively over their local check. The encouraging BCR of over 2.0 also indicated the better remuneration for cultivation of millets under drylands.

**Table 22 : Frontline demonstrations on millets conducted in the state of Tamil Nadu**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Average Yield(q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Finger millet</b>									
Dryland Farming	Pudukottai	Co 15	20	8	9.1	6.45	41.09	2.81	2.37
Integrated Crop Management	Dindigul	Co 15	12	5	19.96	15.71	27.05	2.84	1.77
Variety Introduction	Villupuram	Co 15	15	5	34.61	25.97	33.24	3.30	2.49
Variety Introduction	Vellore	Co 15	10	4	24.5	15.8	55.06	2.44	1.69
			<b>57</b>	<b>22</b>	<b>20.17</b>	<b>14.69</b>	<b>38.66</b>	<b>2.86</b>	<b>2.14</b>
<b>Bajra</b>									
Dryland farming	Pudukottai	Co(Cu) 9	15	6	27.37	20.57	33.06	2.89	2.14
Integrated Crop Management	Dindigul	Co(Cu) 9	12	5	17.39	15.78	10.20	3.06	1.96
Integrated Crop Management	Theni	Co(Cu) 9	20	8	19.08	14.9	28.05	2.06	1.59
Variety Introduction	Tiruvarur	Co 15	5	2	31.5	28.79	9.41	1.83	1.09
			<b>52</b>	<b>21</b>	<b>22.23</b>	<b>18.05</b>	<b>23.46</b>	<b>2.51</b>	<b>1.79</b>
<b>Barnyard millet</b>									
Variety Introduction	Tuticorin	Co – 2	20	8	16.00	11.81	35.48	2.03	1.51
<b>Foxtail millet</b>									
Variety Introduction	Ramnathapuram	Co(KV) 2	10	4	13.41	10.00	34.10	2.68	2.00
Integrated Pest Management	Salem	Co(KV)2	10	5	16	13	23.08	2.03	1.76
			<b>20</b>	<b>9</b>	<b>14.85</b>	<b>11.67</b>	<b>27.98</b>	<b>2.32</b>	<b>1.86</b>
<b>Little millet</b>									
Integrated Crop Management	Dindigul	Co4	12	5	12.28	9.25	32.76	2.46	2.01
Variety Introduction	Villupuram	Co4	15	5	15.16	11.03	37.44	3.60	2.85
Variety Introduction	Vellore	Co4	10	4	5.5	3.61	52.35	2.21	1.75
Variety Introduction	Namakkal	Co4	20	8	15.4	11	40.00	2.99	2.17
			<b>57</b>	<b>22</b>	<b>12.84</b>	<b>9.27</b>	<b>40.02</b>	<b>2.86</b>	<b>2.21</b>
<b>State Total</b>			<b>206</b>	<b>82.0</b>					

**Oilseeds:** During the year 444 demonstrations were conducted by KVKs of Karnataka, Tamil Nadu and Goa states under Zone-VIII covering groundnut, safflower, sesame, linseed and

soybean in an area of 160 ha in farmers' fields. The state wise and KVK wise results are as under:  
**Karnataka:** During the year, 193 demonstrations were conducted by KVKs of Karnataka covering



groundnut, sunflower, soybean, castor, safflower, sesame and linseed under oilseeds in an area of 81 ha in farmers' fields (Table 23). The groundnut crop performed better under technology demonstrations such as ICM, INM, IPM and introduction of cvs. GPBD-4 and G2-52 with BCR upto 4.53. In soybean, demonstration on ICM, INM, IPM and DSb-21 variety introduction have outperformed local farmers' practice with

better BCR. The sunflower IDM and ICM demonstrations gave 31.95% increased yield over farmers' practice. The safflower crop demonstrations during rabi season with IPM have outyielded the farmers practice with 14.93% increased yield. The ICM demonstration in sesame and linseed also recorded an increased yield to the extent of 10.07% and 12.31% respectively as compared to farmers' practice.

**Table 23: Frontline demonstrations on oilseeds conducted in the state of Karnataka**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Groundnut</b>									
Integrated Crop Management	Shimoga	GPBD-4	5	1	19	17.3	9.83	3.82	3.73
Integrated Crop Management	Uttara	G2-52	7	4	19.51	16.89	15.51	2.48	2.28
Integrated Crop Management	Dharwad	GPBD-5	5	2	19.8	17.1	15.79	2.50	2.31
Integrated Nutrient Management	Mandya	Local	10	5	9.58	8	19.75	1.84	1.51
Integrated Nutrient Management	Chitradurga	TMV 2	2	2	13.95	9.5	46.84	2.48	1.90
Integrated Pest Management	Bellary	TMV 2	5	2	17.8	16.2	9.88	2.87	2.49
Variety Introduction	Koppal	G-2-52	5	2	19.25	16.96	13.50	2.54	2.33
Variety Introduction	Bagalkot	G2-52	10	4	31.02	27	14.89	4.53	4.10
Variety Introduction	Haveri	GPBD-5	10	4	22	15	46.67	2.55	1.99
Variety Introduction	Kolar	K6	10	2	7.96	6.09	30.71	0.91	0.75
			<b>69</b>	<b>28</b>	<b>18.38</b>	<b>15.16</b>	<b>23.22</b>	<b>2.64</b>	<b>2.30</b>
<b>Soybean</b>									
Integrated Crop Management	Belagavi-II	DSb-21	10	4	22.8	16.7	36.53	3.34	2.54
Integrated Crop Management	Belagavi	DSb-21	10	3	21.45	16.44	30.47	2.60	1.86
Integrated Crop Management	Dharwad	DSb-21	10	4	18.96	16.23	16.82	2.34	2.13
Integrated Crop Management	Kalaburagi	JS-335	12	5	14.27	12.68	12.54	3.22	2.92
Integrated Nutrient Management	Kalaburagi	JS 335	10	4	18.04	15.14	19.15	2.66	1.95
Integrated Pest Management	Bidar	JS-335	5	5	20.1	13.76	46.08	3.94	3.00
Variety Introduction	Haveri	DSb-21	10	4	21.5	18.2	18.13	4.67	4.28
			<b>67</b>	<b>29</b>	<b>19.36</b>	<b>15.40</b>	<b>25.76</b>	<b>3.30</b>	<b>2.72</b>

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Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Sunflower</b>									
Integrated Crop Management	Vijayapura	DSFH-3	15	6	16.54	14.97	10.49	3.66	3.11
Integrated Disease Management	Bellary	GK-2002	10	4	20.83	12.69	64.14	8.11	4.09
			<b>25</b>	<b>10</b>	<b>18.26</b>	<b>14.06</b>	<b>31.95</b>	<b>5.44</b>	<b>3.50</b>
<b>Linseed</b>									
Integrated Crop Management	Kalaburagi	NL-115	12	5	8.21	7.31	12.31	3.05	2.77
<b>Safflower</b>									
Integrated Pest Management	Dharwad	A-1	10	4	12.47	10.85	14.93	1.79	1.65
<b>Sesamum</b>									
Integrated Crop Management	Mandya	GT-1	10	5	83.71	76.05	10.07	4.29	2.22
State Total			193	81					

**Goa:** The groundnut cv. GPBD-5 demonstrated in 12 farmers' fields of North Goa gave an increased yield of 31.30% with higher BCR of 3.25 as against 2.27 under farmers' practice during the year (Table 24).

**Table 24 : Frontline demonstrations on oilseeds conducted in the state of Goa**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio (Rs/ha)	
					Demo	Check		Demo	Check
<b>Groundnut</b>									
Variety evaluation	North Goa	GPBD-5	12	2	23.41	17.83	31.30	3.25	2.27

**Tamil Nadu:** A total of 239 demonstrations were conducted by KVKs of Tamil Nadu in two major oilseed crops such as groundnut and sesame covering an area of 77 ha during the year (Table 25). The groundnut yield increased under demonstrations by 30.94% as compared to farmers practice due to various technologies like ICM, variety, mechanization, dry farming technique, disease and pest management. In sesame also yield increased by 25.53% due to demonstration of ICM, IDM and cropping systems as compared to farmers' practice. The BCR was higher in all the technology demonstrations as compared to their local check.



**FLD on Integrated Disease Management in sesame at Karur**



**Table 25 : Frontline demonstrations on oilseeds conducted in the state of Tamil Nadu**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Groundnut</b>									
Farm	Virudhunagar	ICGV91114	10	4	32.98	24.45	34.89	2.83	2.24
Mechanisation									
Integrated Crop Management	Erode	Co2	10	4	15.09	13.35	13.03	1.78	1.63
Integrated Crop Management	Namakkal	Co6	20	8	21.5	17.5	22.86	3.52	2.73
Cropping Systems	Namakkal	Co6	10	4	17.1	12.3	39.02	3.06	2.29
Varietal demonstration	Shivagangai	Co -6	9	5	18	14	28.57	3.16	1.94
Dryland farming	Pudukottai	Co7	10	4	20.55	16.65	23.42	2.30	1.70
Integrated Crop Management	Namakkal	Co7	15	6	22	17.5	25.71	3.40	2.73
Integrated Crop Management	Kancheepuram	Co-7	10	2	28	21.25	31.76	4.33	3.35
Variety Introduction	Villupuram	Co 7	10	2	2.62	1.71	53.22	3.90	3.17
Integrated Crop Management	Cuddalore	JL 24	10	4	21.51	18.14	18.58	3.64	3.17
Integrated Crop Management	Ariyalur	JL 24	10	2	19.145	14.08	35.97	1.75	1.49
Integrated Crop Management	Vellore	TMV 13	10	4	14.60	8.45	72.78	2.03	1.35
Integrated Disease Management	Tiruvannamalai	TMV 13	10	4	15.86	13.04	21.63	1.90	1.50
Variety Introduction	Trichirappali	TMV 13	10	4	14.22	12.56	13.22	2.55	2.40
Variety Introduction	Nagapattinam	TMV 13	10	2	16.2	11.75	37.87	2.15	1.95
Integrated Pest Management	Krishanagiri	Local	10		12.69	10.45	21.44	2.26	1.98
Integrated Pest Management	Dharmapuri	Local	10	2	21.5	16.5	30.30	2.61	1.87
Variety Introduction	Vellore	Kadiri 9	10	4	16.3	10.75	51.63	2.45	1.82
			<b>194</b>	<b>65</b>	<b>19.10</b>	<b>14.84</b>	<b>30.94</b>	<b>2.83</b>	<b>2.22</b>
<b>Sesamum</b>									
Cropping Systems	Pudukottai	TMV 7	20	2	9.15	6.47	41.42	3.42	2.37
Integrated Crop Management	Shivagangai	TMV -7	15	6	7.68	6.5	18.15	2.84	1.86
Integrated Disease Management	Karur	VRI(Sv 2)	10	4	4.58	3.56	28.65	2.05	1.82
			<b>45</b>	<b>12</b>	<b>6.89</b>	<b>5.52</b>	<b>25.53</b>	<b>2.67</b>	<b>1.93</b>
<b>State Total</b>			<b>239</b>	<b>77</b>					

**Pulses:** A total of 540 demonstrations were undertaken on major pulses in 207.9 ha area of farmers' fields by the KVKs of Zone-VIII during the year. The state wise and KVK wise results are presented as under:.

**Karnataka:** A total of 217 demonstrations in major pulses such as blackgram, pigeonpea,

cowpea, greengram, field bean and chickpea were conducted in 82.6 ha of farmers' field during 2014-15 by the KVKs of Karnataka state (Table ). In black gram, domination of cv. LBG-625 and ICM have increased yield by 15.34% as compared to farmers' practice. In cowpea, introduction of cv. Arka Garima gave 9.84%



higher yield as compared to local check. Introduction of HA-4 variety and ICM in field bean yielded 15.47% higher yield with BCR of 2.39 as compared to local check. In greengram, ICM and variety introductions have given 15.32% higher yield as compared to farmers' practice. In pigeonpea suitable technologies on

IPM, IPDM, wilt management, planting method and variety introduction have increased yield by 18.12% as compared to farmers' practice. During rabi season, ICM, IPDM, IPM and variety introduction demonstrations in chickpea have led to increased yield to the extent of 19.18% as compared to farmers' practice.

**Table 26 : Frontline demonstrations on pulses conducted in the state of Karnataka**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Blackgram</b>									
Varietal Introduction	Shimoga	LBG - 625	10	4	2.81	2.57	9.34	1.84	1.47
Integrated Crop Management	Chamrajanagar	LBG-625	10	4	9.04	7.45	21.34	2.12	1.79
			<b>20</b>	<b>8</b>	<b>5.93</b>	<b>5.01</b>	<b>15.34</b>	<b>1.98</b>	<b>1.63</b>
<b>Cowpea</b>									
Variety introduction	Dakshina Kannada	Arka Garima	10	1	115.88	105.5	9.84	3.71	3.52
<b>Field bean</b>									
Integrated Crop Management	Bengaluru Rural	HA-4	10	2	9.72	8.13	19.56	2.43	1.77
Demonstration of variety	Hassan	HA-4	10	4	12.25	10.8	13.43	2.36	2.04
Green gram			<b>20</b>	<b>6</b>	<b>11.41</b>	<b>9.91</b>	<b>15.47</b>	<b>2.39</b>	<b>1.95</b>
Integrated Crop Management	Chamrajanagar	BGS-9	11	4	8.35	7.25	15.17	1.98	1.89
Varietal Introduction	Shimoga	KKM-3	10	4	2.6	2.1	23.81	1.97	1.68
Variety Introduction	Bagalkot	DGGV-2	10	4	9.2	8.6	6.98	5.58	5.27
			<b>31</b>	<b>12</b>	<b>6.72</b>	<b>5.98</b>	<b>15.32</b>	<b>3.18</b>	<b>2.95</b>
<b>Pigeonpea</b>									
Integrated Pest Management	Vijayapura	TS-3R	15	6	11.67	10.37	12.54	3.60	3.01
Planting methods	Haveri	BSMR-736	5	4	12.8	9.2	39.13	2.00	1.64
Integrated Pest and Disease Management	Ramanagram	BRG-5	10	4	15.25	12.81	19.05	2.31	1.49
Integrated wilt management	Bengaluru Rural	BRG-5	10	3	13.76	11.43	20.38	2.31	2.11
Variety Introduction	Kolar	BRG-5	10	4	143.75	121.25	18.56	4.88	4.09
Variety Introduction	Chikkaballapur	BRG-5	12	4.8	2.5	2.38	5.04	1.25	1.12
			<b>62</b>	<b>25.8</b>	<b>31.41</b>	<b>26.39</b>	<b>18.12</b>	<b>2.76</b>	<b>2.27</b>
<b>Chickpea (Rabi)</b>									
Integrated Crop Management	Chamrajanagar	JG-11	10	4	9.69	8.3	16.75	1.78	1.51
Integrated Pest and Disease Management	Chikkamagalur	JG-11	25	10	6.2	5.26	17.87	1.56	1.18
Integrated Pest Management	Vijayapura	JG-11	15	6	12.91	11.04	16.94	4.74	3.87
Variety Introduction	Haveri	Jaki-9218	14	5.8	8.1	6.75	20.00	2.45	1.76
Variety Introduction	Bagalkot	TS-3R	10	4	11.75	9.25	27.03	4.41	3.62
			<b>74</b>	<b>29.8</b>	<b>9.13</b>	<b>7.66</b>	<b>19.18</b>	<b>2.79</b>	<b>2.21</b>
		<b>State Total</b>	<b>217</b>	<b>82.6</b>					



**Goa:** During the year, 15 demonstrations were organized by North Goa KVK on cowpea and green gram covering an area of 4 ha in farmers' fields (Table 27). The yield increase was 80% in

cowpea due to IPM demonstration and was over 100% in green gram due to S-4 variety introduction.

**Table 27: Frontline demonstrations on pulses conducted in the state of Goa**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Cowpea</b>									
Integrated Pest Management	North Goa	Alsando-1	10	2	8.35	4.64	79.96	242.03	1.45
<b>Green gram</b>									
Variety evaluation	North Goa	S-4	15	2	6.1	3	103.33	2.67	1.70
State Total			15	4					

**Tamil Nadu:** A total of 273 demonstrations on major pulses like blackgram, greengram, cowpea, horsegram, pigeonpea and chickpea were under taken in 111.3 ha area of farmers' field by the KVKs of Tamil Nadu during rabi season (Table 28). The demonstrations on ICM, IDM, variety evaluation and black gram as crop diversification have given 23.42% higher yield as compared to farmers' practice. Similarly in green gram, ICM, variety introduction, farm mechanization and cropping system

demonstrations have yielded 27.97% higher yield as compared local check. Introduction of horse gram variety CRIDA 18R has given 108% higher yield as against local check in Dharmapuri district. In pigeonpea, ICM and IPM demonstrations gave 23.91% increased yield with BCR of 2.84 as against 2.37 in local check. In chickpea, ICM and IPDM demonstrations gave 23.64% higher yield with better BCR as compared to farmers' practice.

**Table 28: Frontline demonstrations on pulses conducted in the state of Tamil Nadu**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Blackgram</b>									
Integrated Crop Management	Karur	ADT 5	10	4	6.9	5.35	28.97	1.56	1.36
Crop Diversification	Madurai	MDU1	10	4	7.9	6.5	21.54	1.47	1.24
Integrated Crop Management	Dindigul	MDU 1	12	5	6.6	5.4	22.22	2.82	2.08
Integrated Crop Management	Salem	MDU1	12	5	6.9	5.5	25.45	2.19	1.49
Varietal demonstration	Shivagangai	MDU-1	7	8	8	7	14.29	1.35	1.48
Variety demonstration	Cuddalore	MDU 1	10	0.5	7.6	6.25	21.60	2.44	2.00
Variety Introduction	Dharmapuri	MDU 1	10	4	7.8	6	30.00	3.71	2.73
Integrated Crop Management	Perambalur	VBN(Bg)6	25	10	7.68	6.02	27.57	2.29	1.42

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Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
Integrated Crop Management	Trichirappali	VBN(Bg)6	15	6	5.55	4.02	38.06	3.58	2.96
Integrated Disease Management	Pudukottai	VBN (Bg) 6	20	8	10.2	8.6	18.60	2.92	2.37
Integrated Disease Management	Kancheepuram	VBN(Bg)6	6	2	6.13	5.17	20.03	3.23	2.53
Variety demonstration	Cuddalore	VBN 4	12	4.8	7.72	6.9	11.88	1.99	2.32
			<b>149</b>	<b>61.3</b>	<b>7.61</b>	<b>6.23</b>	<b>23.42</b>	<b>2.41</b>	<b>1.94</b>
<b>Chickpea</b>									
Integrated Crop Management	Coimbatore	Co 4	10	4	11.09	9.54	16.25	1.96	1.53
Integrated Pest and Disease Management	Dindigul	JG 11	10	4	9.5	7.25	31.03	1.77	1.45
			<b>20</b>	<b>8</b>	<b>10.30</b>	<b>8.40</b>	<b>23.64</b>	<b>1.87</b>	<b>1.49</b>
<b>Greengram</b>									
Cropping Systems	Pudukottai	Co-8	15	6	9.44	7.69	22.76	2.39	1.85
Farm mechanization	Kancheepuram	Co-8	10	4	9.25	7.5	23.33	4.04	2.56
Integrated Crop Management	Dindigul	Co-8	12	5	6.05	5.2	16.35	2.88	2.24
Integrated Crop Management	Salem	Co-8	12	5	8.91	6.90	29.13	2.69	2.04
Variety Introduction	Dharmapuri	Co-8	10	4	7.32	4.5	62.67	3.01	2.23
Variety Introduction	Theni	Co-8	10	4	7.71	6.49	18.80	2.23	1.77
			<b>69</b>	<b>28</b>	<b>8.16</b>	<b>6.45</b>	<b>27.97</b>	<b>2.83</b>	<b>2.10</b>
<b>Horsegram</b>									
Variety Introduction	Dharmapuri	CRIDA 18 R	10	4	7.3	3.5	108.57	3.04	1.53
<b>Pigeonpea</b>									
Integrated Pest Management	Theni	Co 7	15	6	9.61	8.13	18.20	2.21	1.77
Integrated Crop Management	Krishanagiri	Paiyur 2	10	4	20.15	15.21	32.48	3.77	3.27
			<b>25</b>	<b>10</b>	<b>13.83</b>	<b>10.96</b>	<b>23.91</b>	<b>2.84</b>	<b>2.37</b>
State Total			<b>273</b>	<b>111.3</b>					

**Puducherry:** During the year, drought mitigation technology and YMV resistant variety in blackgram demonstrations in Puducherry yielded 26.91% higher yield as compared to local check (Table 29).

**Table 29: Frontline demonstrations on pulses conducted in the state of Puducherry**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Blackgram</b>									
Drought mitigation	Karaikal	ADT-3	10	4	3.2	2.51	27.49	1.48	1.26
Introduction of YMV resistant variety	Karaikal	VBN-6	5	2	2.88	2.29	25.76	1.69	1.40
State Total			<b>15</b>	<b>6</b>	<b>3.09</b>	<b>2.44</b>	<b>26.91</b>	<b>1.55</b>	<b>1.31</b>

**Kerala:** Demonstration of greengram as crop diversification in paddy fallows in Kasaragod district of Kerala yielded 8.25 q/ha with BCR of 1.91 which emerged as better remunerative crop as compared to other vegetables (Table 30).

**Table 30: Frontline demonstrations on pulses conducted in the state of Kerala**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Greengram</b>									
Crop Diversification	Kasaragod	CO(GG)8	10	4	8.25	0		1.91	

**Commercial and fibre crops:** A total of 189 demonstrations were organized on major commercial crops including fibre crops covering an area of 74 ha during the year by the KVKs of Karnataka, Tamil Nadu, Goa and Kerala under Zone-VIII. The state wise and KVK wise results are presented as under:

**Karnataka:** The crops like mulberry, sugarcane under commercial crops and cotton under fibre crops were demonstrated with ICM, INM, IPM, resource conservation technology in about 25 ha area covering 60 farmers in Karnataka state (Table 31). The results revealed that mulberry leaf yield increased by 14.27%, sugarcane yield

increased by 39.23% and cotton yield by 18.21% due to technology demonstrations as compared local check.



**FLD on IPM in Bt cotton field at Uttara Kannada**

**Table 31 : Frontline demonstrations on commercial and fibre crops conducted in the state of Karnataka**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Mulberry</b>									
Integrated Crop Management	Kalaburagi	V1-1	3	1	58	56	3.57	2.67	1.60
Integrated Nutrient Management	Mandya	V-1	10	5	100	83.3	20.05	2.67	2.34
Integrated Pest Management	Chikkaballapura	V-1	10	4	104.5	95.25	9.71	1.99	1.44
			<b>23</b>	<b>10</b>	<b>97.60</b>	<b>85.35</b>	<b>14.27</b>	<b>2.40</b>	<b>1.91</b>
<b>Sugarcane</b>									
Integrated Crop Management	Bidar	CO-86032	5	2	1650	1050	57.14	6.60	3.16
Integrated Crop Management	Vijayapura	Co-86032	5	2	1613	1333	21.01	2.84	2.25
Integrated Pest Management	Mysore	Co 86032	10	4	985	875	12.57	2.26	1.99
Resource Conservation Technology	Bidar	CO-86032	2	3	1650	875	88.57	2.98	2.30
SSI and micronutrient management	Belagavi	Co-86032	10	2	1549	1304	18.84	4.56	3.18
			<b>32</b>	<b>13</b>	<b>1424</b>	<b>1038</b>	<b>39.23</b>	<b>3.54</b>	<b>2.47</b>
<b>Cotton</b>									
Integrated Crop Management	Kalaburagi	Bt Cotton	5	2	24.99	21.14	18.21	2.28	1.73
<b>State Total</b>			<b>60</b>	<b>25</b>					

**Goa:** Demonstration of ICM technology in sugarcane cv. Co-92005 gave 24.36% higher cane yield as compared local check in Goa state (Table 32)

**Table 32: Frontline demonstrations on commercial and fibre crops conducted in the state of Goa**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Sugarcane</b>									
Integrated Crop Management	North Goa	Co 92005	4	2	684	555	24.36	1.69	1.35

**Tamil Nadu:** A total of 115 demonstrations were conducted by KVKs in sugarcane and cotton covering an area of 46 ha during the year in the state of Tamil Nadu (Table 33 ). The results revealed that the cane yield increased by 28.32% due to demonstration of ICM, IPM, farm mechanization and variety introduction as compared to farmers' practice. Similarly, in cotton the yield was increased by 37.51% due to ICM and INM demonstrations over farmers' practice. The BCR was also better in all the demonstrations as against local check.



**FLD on installation of pheromone trap for the management of internode borer in sugarcane at Thiruvannamalai**

**Table 33: Frontline demonstrations on commercial and fibre crops conducted in the state of Tamil Nadu**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio (Rs/ha)	
					Demo	Check		Demo	Check
<b>Sugarcane</b>									
Farm Mechanisation	Madurai	CO(Si)8	10	4	1020	760	34.21	2.62	1.82
Integrated Crop Management	Madurai	CO(Si)8	10	4	400	380	5.26	2.40	1.97
Integrated Pest Management	Trichy	CO 86032	5	2	1180	890	32.87	1.74	1.33
Integrated Pest Management	Thiruvannamalai	COC86032	15	6	1130	950	19.11	2.29	1.73
Crop Diversification	Pudukottai	CO 86032	10	2	1850	1079	71.46	3.30	2.18
Integrated Pest Management	Salem	COC86032	10	4	929	685	35.46	2.97	1.86
			<b>60</b>	<b>22</b>	<b>1010</b>	<b>770</b>	<b>28.32</b>	<b>2.54</b>	<b>1.82</b>
<b>Cotton</b>									
Integrated Crop Management	Coimbatore	Suraj	10	4	20.72	16.85	22.97	2.27	1.82
Integrated Crop Management	Erode	Suraj	10	4	17.96	16.1	11.55	1.50	1.36
Integrated Crop Management	Shivagangai	SVPR-2	15	8	20.33	15	35.53	2.88	1.98
Integrate Nutrient Management	Virudhunagar	SVPR4	10	4	14.57	8.84	64.82	3.38	2.20
Integrated Crop Management	Virudhunagar	SVPR4	10	4	15.62	10.1	54.65	3.38	2.28
			<b>55</b>	<b>24</b>	<b>18.26</b>	<b>13.65</b>	<b>37.51</b>	<b>2.71</b>	<b>1.94</b>
		<b>State Total</b>	<b>115</b>	<b>46</b>					

**Kerala:** Integrated weed management demonstration in sugarcane has given 17.07% increased cane yield as compared to farmers practice in the state of Kerala (Table 34).

**Table 34: Frontline demonstrations on commercial crops conducted in the state of Kerala**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio		
					Demo	Check		Demo	Check	
<b>Sugarcane</b>										
Integrated Weed Management	Pathanamthitta	Maduri	10	1	960	820	17.07	1.76	1.55	

**Fodder crops:** During the year, 285 demonstrations were conducted on the production of fodder crops including mixed fodder production in 73.5 ha area in the States of Karnataka, Tamil Nadu and Kerala. The state wise and KVK wise results are presented as under:.

**Karnataka:** A total of 55 demonstrations were conducted on fodder crops covering an area of 10.5 ha by six KVKs in the state of Karnataka during the year (Table 35). The demonstration of varieties and fodder production technology gave an increased yield to the extent of 45.87% as compared to local practice. The BCR also was higher under demonstrations.



**FLD on fodder and grass species at Gadag**

**Table 35: Frontline demonstrations on fodder crops conducted in the state of Karnataka**

Thematic Area	KVK	Crop	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
						Demo	Check		Demo	Check
<b>Fodder crops</b>										
Variety evaluation	Mysore	Fodder	Co 4	15	2	167.1	120	39.25	2.15	1.55
ICM	Ramanagaram	Fodder	DHN-6	15	4	25.3	16.95	49.26	7.62	5.21
Variety evaluation	Tumkur	Fodder	COFS 29-1	5	1	2.5				
Fodder production	Chitradurga	Fodder Sorghum, lucifer, cowpea, horsegram, maize	COFS-29, Locals	5	2.5	47.56	30.5	55.93		
Fodder production	Bellary	Hedge lucern	Local	10		50			10.36	
ICM	Davanagere	Napier	DHN-6, Guinea-BG-9, Lucerne-T9, Sesbenia	5	1	199.5	120	66.25	4.08	1.50
<b>State Total</b>				<b>55</b>	<b>10.5</b>	<b>72.03</b>	<b>48.00</b>	<b>45.87</b>	<b>3.70</b>	<b>2.42</b>



**Tamil Nadu:** A total of 203 demonstrations were conducted in fodder crops like fodder sorghum, bajra napier, anjan grass, lucern and also mixed fodder production covering an area of 60.2 ha farmers' fields during the year by the KVKs of Tamil Nadu state (Table 36). The results on

fodder sorghum revealed that the fodder yield increased by 21.80% due to technology demonstration as compared to local check. Whereas, in mixed fodder production models gave an increased fodder yield of 233% as against local check.

**Table 36: Frontline demonstrations on fodder crops conducted in the state of Tamil Nadu**

Thematic Area	KVK	Crop	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha) Demo	Yield (q/ha) Check	% increase over check	B:C ratio Demo	B:C ratio Check
<b>Fodder crops</b>										
Fodder Crops	Pudukottai	Fodder crops	CO (FS) 29	10	2	73.15	41.7	75.42	2.58	2.03
Cropping Systems	Salem	Fodder Sorghum	Co(FS)31	10	2	335	280	19.64	2.96	1.85
Fodder Crops	Kanyakumari	Fodder sorghum	Co(FS)31	10	4	167.3	148.8	12.43	2.44	1.92
Fodder Crops	Madurai	Fodder Sorghum	Co(FS)31	10	4	1180	1020	15.69	4.20	3.64
Fodder Crops	Kancheepuram	Fodder sorghum	Co(FS)31	5	2	7.25	5.5	31.82	2.89	2.11
Fodder Crops	Virudhunagar	Fodder Sorghum	Co(FS)31	4	2	192	159	20.75	4.50	3.68
Variety Introduction	Tiruvarur	Fodder Sorghum	Co(FS)31	10	2	297.5	284	4.75	1.41	1.18
Variety Introduction	Namakkal	Fodder sorghum	Co(FS)31	25	10	5.5	4.5	22.22	2.83	2.43
Variety Introduction	Vellore	Fodder Sorghum	Co(FS)31	10	4	804			3.02	1.62
Varietal demonstration	Shivangai	Sorghum	Co(FS)31	5	5	45	32	40.63	3.50	2.27
Crop Management	Cuddalore	Fodder sorghum	Co(FS)31	10	4	13.23	-		4.48	-
Fodder Crops	Coimbatore	Fodder sorghum	Co(FS)31	10	1	863.1	826.1	4.48	3.76	3.08
Variety Introduction	Nagapattinam	Sorghum	Co(FS)31	10	4	212.5	153	38.89	2.43	1.58
				<b>129</b>	<b>46</b>	<b>270</b>	<b>170</b>	<b>21.80</b>	<b>3.14</b>	<b>2.26</b>
Agroforestry	Namakkal	Anjan grass, Stylo, Subabul	Anjan grass + Stylo + Subabul	7	2.8	400	200	100.00	2.20	1.67
Cropping Systems	Namakkal	Bajra Napier, Fodder sorghum, Hedgelucerne	CO4, COFS29	17	6.8	2000	400	400.00	2.76	2.22
Fodder Crops	Ariyalur	Fodder sorghum, Cumbu Napier grass, Fodder cowpea	CO (CN)4, CO (FS) 31, CO(FC)8	5	2	321	232	38.36	2.28	1.83

Contd...



Thematic Area	KVK	Crop	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
						Demo	Check		Demo	Check
Fodder Crops	Dindigul	Hemilgrass, Desmanthus & Sesbania	Hemilgrass-CO(Gg) 3	20	0.48	1350	297	354.55	5.35	4.61
Fodder Crops	Erode	Mixed fodder	Co4, CoFS29, Agathi, Hedge Lucerne	5	2	94.64	71.36	32.62	2.13	1.88
Fodder Crops	Krishanagiri	Mixed fodder	Mixed crops	20	0.125	2946	2312	27.42	2.74	2.06
				<b>74</b>	<b>14.20</b>	<b>1166</b>	<b>304</b>	<b>233</b>	<b>2.58</b>	<b>2.09</b>
<b>State Total</b>				<b>203</b>	<b>60.2</b>					

**Kerala:** A total of 27 demonstrations were organized by KVKs of Kerala state on improved fodder production technologies including improved varieties covering an area of 2.8 ha

mostly in the home backyards during the year (Table 37). The results indicated an increased fodder yield to the extent of 31.67% under demonstrations as against local check.

**Table 37: Frontline demonstrations on fodder crops conducted in the state of Kerala**

Thematic Area	KVK	Crop	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
						Demo	Check		Demo	Check
<b>Fodder crops</b>										
Resource management	Kasaragod	Fodder grass	CO3	3	0.6	1200	-	-	1.13	1.71
Fodder Crops	Thrissur	Fodder Bajra	Fodder maize, bajra	10	0.2	1900	-	-	1.81	-
Fodder Crops	Pathanamthitta	Fodder crop	Napier CO4	10	1	4820	3200	50.63	1.81	1.81
Fodder Crops	Pathanamthitta	Fodder crop	Hybrid napier, Subabul, Sesbania	4	1	4556	3300	38.06	1.76	1.50
<b>State Total</b>				<b>27</b>	<b>2.8</b>	<b>3741</b>	<b>2321</b>	<b>31.67</b>	<b>1.65</b>	<b>1.55</b>

**Vegetable crops:** Vegetable crops such as amaranthus, brinjal, cabbage, chilli, coccinia, field bean, French bean, onion, tomato, lab lab, gourds, yardlong bean, watermelon, beet root, green peas and vegetable cowpea were demonstrated with improved technologies in 790 farmers' fields covering an area of 223.5 ha by the KVKs of Zone-VIII. The state wise and KVK wise results are presented as under:

**Karnataka:** A total of 357 demonstrations were

conducted in major vegetables covering an area of 103.3 ha by the KVKs of Karnataka State during the year (Table 38). Cultivation of amaranthus in 30 farmers fields recorded 31.82% increased greenleaf yield with BCR of 2.71 as compared to farmers practice with BCR of 1.96. In brinjal, demonstration of ICM, IPM and IPDM technology has recorded 27.58% increased yield as compared their local check. In cabbage, ICM

demonstration has resulted in production of 246.9 q/ha cabbage yield with BCR of 3.96. Demonstrations of IDM in chillies demonstrated an increase of 12.3% in green chilli yield. In field bean, although seed yield was less in HA-4 varieties at Mysore, the BCR was higher as more price was realized for the seed. ICM, seed production and variety introduction in French bean gave 26.73% higher bean yield as compared to local check. Demonstration of IPDM in green peas gave 23.78% increased pea yield as against local check. ICM demonstration in Arka Anupama variety of palak gave 152.84% higher yield as compared to local check. Demonstrations on ICM, IDM, INM, IPDM and improved variety in onion recorded their superiority over local

check both in terms of yield and economics. In brinjal, demonstration of ICM, IPM and IPDM technologies registered an increased yield to the extent of 27.58% as compared to local check. Similarly demonstration of INM and ICM in beet root, IPDM in bitter gourd, ICM in cabbage, INM and variety in ridge gourd, ICM and IPM in tomato have out yielded their local check with better yield and economic returns under farmers' field conditions. Demonstration of IPDM and ICM in yardlong bean gave an increased yield to the extent of 36.86% as compared local check. The watermelon crop demonstrated with IPM technology gave 15.42% higher yield with better BCR of 2.46 as compared to 2.17 under farmers' practice.

**Table 38: Frontline demonstrations on vegetables crops conducted in the state of Karnataka**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Amaranthus</b>									
Integrated Crop Management	Udupi	Arka Arunima	20	2.5	167.5	122.25	37.01	3.07	2.05
Integrated Crop Management	Davanagere	Arka Suguna	10	2	91.95	73.37	25.32	2.25	1.85
			<b>30</b>	<b>4.5</b>	<b>133.92</b>	<b>100.53</b>	<b>31.82</b>	<b>2.71</b>	<b>1.96</b>
<b>Beetroot</b>									
Integrated Nutrient Management	Bengaluru Rural	Ruby Queen	10	1	22.8	21.43	6.39	3.01	2.81
<b>Bittergourd</b>									
Integrated Crop Management	Belagavi	Pali	5	2	98.75	87.5	12.86	2.78	2.40
Integrated Pest and Disease Management	Ramanagaram	Maya	10	2	240	170	41.18	1.98	1.55
			<b>15</b>	<b>4</b>	<b>169.38</b>	<b>128.75</b>	<b>27.02</b>	<b>2.38</b>	<b>1.97</b>
<b>Brinjal</b>									
Integrated Crop Management	Mandya	Local	8	1.6	317.18	250	26.87	2.80	1.60
Integrated Crop Management	Bellary	Rayadurga	5	4	526	464	13.36	7.20	5.80
Integrated Crop Management	Belagavi		21	5.2	619.5	495	25.15	5.30	4.30
Integrated Pest and Disease Management	Ramanagaram		10	2	320	230	39.13	1.85	1.30
Integrated Pest Management	Tumkur	Arka Shirish	5	1	279.6	159.7	75.08	3.37	1.81
			<b>49</b>	<b>13.8</b>	<b>489.31</b>	<b>394.91</b>	<b>27.58</b>	<b>4.92</b>	<b>3.81</b>

(Contd.)



Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Cabbage</b>									
Integrated Crop Management	Haveri		10	4	225	160	40.63	3.44	2.97
Integrated Crop Management	Bidar	Indam – 269	3	1.2	320.3	296.7	7.95	5.70	6.09
			<b>13</b>	<b>5.2</b>	<b>246.99</b>	<b>191.55</b>	<b>33.09</b>	<b>3.96</b>	<b>3.69</b>
<b>Chilli green</b>									
Integrated Nutrient Management	Chamrajanagar	Bullet	5	2.2	204.5	182.1	12.30	1.95	1.82
<b>Field bean</b>									
Seed production	Mysore	HA-4	10	4	7.26	33.05	-	2.99	1.83
							78.03		
Crop Improvement	Chitradurga	HA-4	12	5	750	540	38.89	3.70	3.03
			<b>22</b>	<b>9</b>	<b>739.33</b>	<b>446.89</b>	<b>45.82</b>	<b>3.38</b>	<b>2.50</b>
<b>Frenchbean</b>									
Demonstration of Variety	Hassan	Arka Suvidha	15	3	135	107	26.17	4.05	3.23
Integrated Crop Management	Belagavi	Arka Anup	5	2	130	110	18.18	5.65	4.85
Seed Production	Tumkur	Arka Suvidha	10	2	98.75	71.5	38.11	3.12	2.26
Integrated Crop Management	Davanagere	Arka Anoop	5	1	205	167	22.75	2.67	2.21
			<b>35</b>	<b>8</b>	<b>133.44</b>	<b>106.38</b>	<b>26.73</b>	<b>4.05</b>	<b>3.26</b>
<b>Green peas</b>									
Integrated Pest & Disease Management	Belagavi	Arkel	10	4	16.24	13.12	23.78	2.10	1.87
<b>Onion</b>									
Crop Management	Chitradurga	Satara	2	0.8	210	150	40.00	3.34	2.11
Integrated Crop Management	Bagalkot	Arka Kalyan	10	4	141.95	130.5	8.77	2.66	2.54
Integrated Crop Management	Dharwad	Arka Kalyan	10	4	114.9	92.3	24.49	2.28	1.86
Integrated Crop Management	Gadag	Arka Kalyan	10	4	56.11	45.29	23.89	1.70	1.48
Integrated Crop Management	Kalaburagi	Bhima Super	12	5	149	134	11.19	4.39	3.82
Integrated Crop Management	Chamrajanagar	Erode local	12	5	81.2	69.1	17.51	2.61	2.40
Integrated Disease Management	Haveri	Bellary red	10	4	220.4	180.3	22.24	3.33	2.87
Integrated Nutrient Management	Bellary	Bellary Red	5	2	256	235	8.94	3.53	2.81
Integrated Nutrient Management	Kalaburagi	Bhima super	5	1	168.5	142.5	18.25	2.93	2.19
Integrated Pest and Disease Management	Vijayapura	Puna pusangi	10	4	283.8	237.9	19.29	2.74	2.12
Variety Introduction	Koppal	Bhima Super	4	2.5	222	179.3	24.09	2.59	1.71
			<b>90</b>	<b>36.3</b>	<b>160.45</b>	<b>136.13</b>	<b>18.36</b>	<b>2.89</b>	<b>2.43</b>
<b>Palak</b>									
Integrated Crop Management	Ramanagaram	Arka Anupama	10	1	248.62	98.33	152.84	2.27	1.86
<b>Ridgegourd</b>									
Demonstration of high yielding variety	Hassan	Arka Sumith	15	3	220	180	22.22	4.09	3.30
Integrated Nutrient Management	Bengaluru Rural	Mallika	10	1	116.4	107.7	8.08	2.61	2.42
			<b>25</b>	<b>4</b>	<b>194.10</b>	<b>161.93</b>	<b>18.69</b>	<b>3.72</b>	<b>3.08</b>

(Contd.)



Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Tomato</b>									
Integrated Crop Management	Kalaburagi	Local	5	0.5	85.55	68.42	25.04	1.55	1.19
Integrated Pest Management	Mandya	Alankar	8	1.6	453	361.5	25.31	1.30	1.11
			<b>13</b>	<b>2.1</b>	<b>365.51</b>	<b>291.72</b>	<b>25.25</b>	<b>1.36</b>	<b>1.13</b>
<b>Yardlong bean</b>									
Integrated Pest and Disease Management	Ramanagaram	Arka Samrudhi	10	2	180	130	38.46	2.26	1.79
Integrated Crop Management	Udupi	Arka Mangala	10	1	163.2	122.1	33.66	3.26	2.61
			<b>20</b>	<b>3</b>	<b>174.40</b>	<b>127.37</b>	<b>36.86</b>	<b>2.60</b>	<b>2.06</b>
<b>Watermelon</b>									
Integrated Pest Management	Chamrajanagar	Sugarqueen	10	5.2	421.3	365	15.42	2.46	2.17
<b>State Total</b>			<b>357</b>	<b>103.3</b>					

**Goa:** A total of 16 demonstrations were conducted on capsicum under protected cultivation, cucumber with ICM technology and onion variety in 1.5 ha area during the year. All

crops recorded higher yield under technology demonstration with better BCR as compared to their local check (Table 39)

**Table 39 : Frontline demonstrations on vegetable crops conducted in the state of Goa**

Thematic Area	KVK	Crop	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
						Demo	Check		Demo	Check
Protected cultivation	North Goa	Capsicum	Indra	1	0.25	720	0		1.76	
Integrated Pest Management	North Goa	Cucumber	Local	10	1	133	92.4	43.94	3.69	2.86
Variety evaluation	North Goa	Onion	Arka Lalima	5	0.25	315	172	83.14	3.71	2.77
<b>State Total</b>				<b>99</b>	<b>21.7</b>					

**Tamil Nadu:** A total of 412 demonstrations on major vegetable crops of the state of Tamil Nadu were demonstrated in 116.7 ha area during the year (Table 40). In amaranthus, cv. PLR-1 (Sirukeerai) and cropping system demonstrations gave 24.12% higher green leaf yield with better BCR. Demonstration of ICM, IDM and INM technologies in bhendi gave an increased yield to the extent of 37.47% as compared to local practice. Similarly, ICM demonstration in bitter gourd and bottle gourd, cv. Co-14 in lab lab, IDM in carrot, IPDM in cauliflower, cv. PMK-1 in vegetable cowpea, fruit fly management in coccinia and ICM in moringa have outperformed

over their respective local checks in terms of yield and economic returns. In brinjal, technologies such as drought management, ICM and IPM demonstrations have resulted in the increased yield (45.17%) and economic returns (BCR 3.04) as compared to farmers' practice. Resource conservation technology, ICM and cv. Co-14 demonstration in field bean gave 22.59% higher yield as compared to local check. Demonstration of ICM and IDM technologies in French bean resulted in the increased yield and economic returns as compared to farmers' practice. In onion, demonstration of Co-5 onion variety, ICM, IDM, IPM and adoption of onion in cropping

systems have resulted in better yield and economic returns as compared to local practice. The snake gourd crop performed better under ICM and IPM technology demonstrations with increased yield and economic returns. Similarly, INM and IPM technologies demonstration in tomato and IPDM demonstration in watermelon gave increased yield to the extent of 23.76% and 25.89% respectively as compared to local practice.



**FLD on fruitfly management in snakegourd at Theni district**

**Table 40: Frontline demonstrations on vegetables conducted in the state of Tamil Nadu**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Amaranthus</b>									
Cropping Systems	Pudukottai	PLR1 (Sirukeera i)	20	2	83.6	62.8	33.12	3.32	2.34
Varietal demonstration	Shivagangai	PLR -1	10	2	81.65	71.15	14.76	2.53	1.96
Variety Introduction	Dharmapuri	PLR- 1	10	4	79.53	61.02	30.33	3.35	2.15
Variety Introduction	Namakkal	PLR1	5	1	143	109	31.19	2.86	2.22
Variety Introduction	Villupuram	PLR 1	10	2	112	103	8.51	6.73	6.21
			<b>55</b>	<b>11</b>	<b>94.18</b>	<b>73.43</b>	<b>24.12</b>	<b>3.71</b>	<b>2.89</b>
Integrated Crop Management	Thiruvallur	Co(BH)-1	10	1	167.25	117.25	42.64	3.26	2.22
Integrated Pest and Disease Management	Kanyakumari	Co(BH)-1	10	4	226	163	38.65	3.34	2.40
Integrated nutrient management	Coimbatore	Mycho 10	4	0.4	194.85	172.9	12.70	2.65	2.09
			<b>24</b>	<b>5.4</b>	<b>212.81</b>	<b>155.26</b>	<b>37.47</b>	<b>3.28</b>	<b>2.35</b>
Integrated Crop Management	Pudukottai	Co1	10	2	98.18	80.54	21.90	2.50	2.23
Bottle gourd									
Integrated Crop Management	Kanyakumari	Local	10	4	15.93	14.86	7.20	1.92	2.70
			<b>20</b>	<b>6</b>	<b>43.35</b>	<b>36.75</b>	<b>12.10</b>	<b>2.12</b>	<b>2.54</b>
Drought Management	Tuticorin	KKM – 1	5	2	19.38	15.7	23.44	2.82	2.67
Integrated Crop Management	Coimbatore	Karamada i varikkai	10	2	298.7	245.5	21.67	2.50	1.94
Integrated Crop Management	Pudukottai	Local	10	4	62.4	51.7	20.70	4.77	3.33
Integrated Crop Management	Krishanagiri	Palayam	10	2	420.1	365.5	14.94	3.35	2.44
Integrated Crop Management	Thiruvallur	Local	10	2	240.45	290.3	207.47	3.94	2.76
Integrated Pest Management	Madurai	MDU1	10	5	520	400	30.00	1.50	1.21
			<b>55</b>	<b>17</b>	<b>282.76</b>	<b>237.69</b>	<b>45.17</b>	<b>3.04</b>	<b>2.30</b>
Variety demonstration	Cuddalore	Co (Gb)	10	4	74.5	52.1	42.99	5.21	3.20

(Contd...)



Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Carrot</b>									
Integrated Disease Management	The Nilgiris	Early Nantes	10	2	284.15	265.62	6.98	1.59	1.39
Integrated Pest and Disease Management	The Nilgiris	Snow Mystique	5	0.7	230.63	205	12.50	3.22	2.37
<b>Chilli green</b>									
Farm Mechanisation	Madurai	COH2	10	4	569	485	17.32	1.23	1.18
Integrated Crop Management	Madurai	K-1	10	4	136	100	36.00	3.66	2.75
Integrated Crop Management	Vellore	Local	5	2.5	250	191.4	30.62	2.60	2.10
			<b>25</b>	<b>10.5</b>	<b>328.10</b>	<b>268.43</b>	<b>27.60</b>	<b>2.48</b>	<b>2.00</b>
Fruitfly management	Theni	Local	10	4	104.7	86.1	21.60	2.05	1.62
Cowpea									
Variety Introduction	Trichy	PKM1	10	4	160.8	0		2.25	
<b>Fieldbean</b>									
Resource conservation Technologies	The Nilgiris	Local	4	1.5	10.69			1.44	
Integrated Crop Management	Krishanagiri	Co(Gb)-14	10	2	74.98	64.4	16.43	2.52	1.88
Integrated Crop Management	Kancheepuram	Co(Gb)-14	14	2	32.55	22.47	44.86	3.70	2.14
Integrated Crop Management	Dindigul	Co(Gb) 14	6	2	95.2	91.18	4.41	2.86	2.43
Variety Introduction	Tuticorin	Co(Gb) 14	10	4	77.27	58.5	32.09	4.37	3.21
Integrated Crop Management	Salem	PLR1	10	2	83.5	68.8	21.37	4.23	2.73
			<b>44</b>	<b>11.5</b>	<b>63.53</b>	<b>51.31</b>	<b>22.59</b>	<b>3.29</b>	<b>2.24</b>
Integrated Disease Management	Dindigul	Selection 9	10	4	110.1	80.25	37.20	2.68	1.98
Integrated Crop Management	Erode	Arka Sharath	10	4	138.47	98.11	41.14	2.65	2.38
<b>Moringa</b>									
Integrated Crop Management	Nagapattinam	PKM-1	10	4	543.75	387	40.50	2.90	1.73
Onion									
Cropping Systems	Namakkal	Co (On) 5	10	2	76	66	15.15	3.97	2.75
Integrated Crop Management	Kancheepuram	Co (On) 5	3	1	385	366	5.24	3.91	3.78
Integrated Disease Management	Madurai	Co(On) 5	10	4	150	120	25.00	4.40	2.27
Integrated Pest Management	Salem	Co (On) 5	10	2	104	90	16.13	2.95	2.21
Varietal demonstration	Shivagangai	Co-5 Co (On) 5	10	2	152	149	2.01	2.85	2.16
Variety Introduction	Thiruvallur	Co (On) 5	10	2	113	0		3.14	
Integrated Disease Management	Virudhunagar	Local variety	5	2	87.4	65.8	32.83	1.91	1.47
			<b>58</b>	<b>15</b>	<b>136.91</b>	<b>105.93</b>	<b>15.83</b>	<b>3.41</b>	<b>2.00</b>
Integrated Pest Management	Theni	Local	10	4	124.3	102.9	20.80	2.16	1.63
Integrated Crop Management	Nagapattinam	PLR(SG)2	10	2	138	102	35.29	3.45	2.33

(Contd...)



Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Tomato</b>			<b>20</b>	<b>6</b>	<b>128.87</b>	<b>102.60</b>	<b>25.63</b>	<b>2.59</b>	<b>1.86</b>
Integrated Nutrient Management	Coimbatore	Co-3	6	0.6	880.91	711.45	23.82	2.57	1.88
Integrated Pest Management	Madurai	Co-3	10	4	490	420	16.67	1.58	1.27
Integrated Pest Management	Salem	Sivam	10	2	680.5	493.4	37.92	3.28	2.57
			<b>26</b>	<b>6.6</b>	<b>583.26</b>	<b>468.74</b>	<b>23.76</b>	<b>2.18</b>	<b>1.72</b>
<b>Watermelon</b>									
Integrated Pest and Disease Management	Villupuram	NS 295	10	1	353.5	280.8	25.89	3.29	1.86
State Total			412	116.7					

**Puducherry:** ICM technology demonstration in cv. Arka Anoop in French bean gave 12.12% higher yield as compared to local check in the state of Puducherry (Table 41).

**Table 41: Frontline demonstrations on vegetables conducted in the state of Puducherry**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>French bean</b>									
Integrated Crop Management	Pondicherry	Arka anoop	5	2	185	165	12.12	3.69	3.17

**Tuber crops:** A total of 194 demonstrations were conducted on major tuber crops like potato, sweet potato, tapioca, elephant foot yam, coleus, taro and Tania covering an area of 41.42 ha by the KVKs of Karnataka, Tamil Nadu, Puducherry and Kerala states during the year. The state wise and KVK wise results are as under:

**Karnataka:** In potato, 20 demonstrations were conducted on INM and ICM technologies covering an area of 8 ha by KVKs of Karnataka during 2014-15 season. The results indicated that ICM and INM technologies have out yield its local check to the extent of 19.77% and 18.27 % respectively with better BCR (Table 42).

**Table 42: Frontline demonstrations on tuber crops conducted in the state of Karnataka**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Potato</b>									
Integrated Crop Management	Hassan	K.Jyothi	10	4	103	86	19.77	4.62	3.39
Integrated Nutrient Management	Chikkaballapura	Kufri Jyothi	10	4	267	225.75	18.27	2.36	2.05
State Total			20	8	185.00	155.88	19.02	3.49	2.72

**Tamil Nadu:** Crops such as potato, sweet potato, tapioca and coleus were demonstrated with ICM, INM, IDM and variety introduction in 86 farmers' fields covering an area of 22.7 ha during the year (Table 43). The results have indicated the superiority of demonstrated technologies by

registering higher yield and economic returns to the investment in all technologies. The yield increase was 44.58% in potato, 19.18% in sweet potato, 23.81% in tapioca and 19.80% in coleus with better BCR as compared to farmers' practice.

**Table 43: Frontline demonstrations on tuber crops conducted in the state of Tamil Nadu**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Potato</b>									
Variety evaluation	The Nilgiris	Kufri giridhari	6	0.7	300	207.5	44.58	2.47	1.31
Sweet potato									
Integrated Crop Management	Karur	Sree Arun	10	5	17.25	14.474	19.18	1.83	1.53
<b>Tapioca</b>									
Integrated Crop Management	Trichirappali	MDV 1	10	2	212	187	13.19	1.76	1.63
Integrated Crop Management	Salem	YTP1	10	2	441.5	346.4	27.45	4.07	9.11
Variety Introduction	Villupuram	Yethapur 1	10	1	50	44.6	12.11	2.50	2.23
Variety Introduction	Namakkal	Yethapur-1	20	4	425	350	21.43	1.75	1.67
Integrated Nutrient Management	Kanyakumari	Local	10	4	496	374	32.62	2.55	2.39
<b>Coleus</b>									
			<b>60</b>	<b>13</b>	<b>387.77</b>	<b>308.31</b>	<b>23.81</b>	<b>2.41</b>	<b>2.46</b>
Integrated Disease Management	Trichirappali	Mangani Peru	10	4	14.22	11.87	19.80	3.95	3.63
<b>State Total</b>			<b>86</b>	<b>22.7</b>					

**Puducherry:** Elephant foot yam, the only tuber crop demonstration with IDM technology in the state of Puducherry by the KVK in six farmers'

fields gave an increased yield to the extent of 10.20% as compared to local check. The BCR was 3.56 as against 3.10 in local check (Table 44).

**Table 44 : Frontline demonstrations on tuber crops conducted in the state of Puducherry**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Elephant foot yam</b>									
Integrated Disease Management	Pondicherry	Local	6	2.4	372.8	338.28	10.20	3.56	3.10

**Kerala:** A total of 82 demonstrations on frontline technologies in tuber crops like elephant foot yam (*amorphophallus*), tapioca (cassava), coleus and taro were under taken in 8.32 ha area by KVKs of Kerala during the year (Table 45). The demonstration on optimization of use of chemicals, adoption in cropping systems in *amorphophallus* have together recorded 37.40% increased yam yield as compared to local check.

In tapioca, INM, bio-intensive pest management, ICM and mulching technology demonstrations have recorded impressive yield increase to extent of 55.26% over local check. Similarly demonstration of cv. Nidhi in coleus, Integrated Weed Management in Tania and organic farming technology in taro have also recorded an impressive yield gains as compared to their local checks.

**Table 45: Frontline demonstrations on tuber crops conducted in the state of Kerala**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Elephant foot yam</b>									
Optimization of the use of chemicals in crop production	Trivandrum	Local	10	1	536.1	383	39.97	2.11	1.37
Cropping Systems	Alleppey	HYV Gajendra	10	0.2	24786	19906	24.52	1.82	1.44
			<b>20</b>	<b>1.2</b>	<b>4577</b>	<b>3636</b>	<b>37.40</b>	<b>2.06</b>	<b>1.38</b>
<b>Tapioca</b>									
Integrated Nutrient Management	Ernakulam	Sree Vijaya	2	1	327.5	293	11.77	2.06	1.94
Bio intensive pest management	Trivandrum	Local	10	2	280.5	137.2	104.5	1.05	1.46
Integrated Crop Management	Idukki	Local	10	1	156	90	73.33	1.20	1.17
Mulching technique	Trivandrum	local	10	2	232.8	196	18.78	1.55	
			<b>32</b>	<b>6</b>	<b>251.68</b>	<b>174.90</b>	<b>55.26</b>	<b>1.40</b>	<b>1.0</b>
<b>Coleus</b>									
Variety demonstration	Thrissur	Nidhi	10	0.08	16.88	12	40.67	2.27	
<b>Tania</b>									
Integrated Weed Management	Pathanamthitta	Local	10	1	114	106	7.55	1.72	1.63
<b>Taro</b>									
Organic Farming	Kollam	Sreekiran	10	0.04	113	81	39.51	1.51	1.14
<b>State Total</b>			<b>82</b>	<b>8.32</b>					

**Spice crops:** A total of 398 demonstrations were under taken in major spices like black pepper, cardamom, ginger, turmeric, nutmeg, dry chillies, garlic and coriander covering an area of 94.2 ha in the states of Karnataka, Tamil Nadu, Puducherry and Kerala by the KVKs under Zone-VIII. The state wise and KVK wise results are as under:

**Karnataka:** In spices, a total of 196 demonstrations were conducted in black pepper, dry chilli, garlic, ginger and turmeric covering an

area of 46.8 ha during the year (Table 46). The yield increase recorded as compared to farmers' practice was 95 % in black pepper due to IDM, ICM, foliar nutrition and INM demonstrations and the yield increase in dry chillies was 12.92% due to ICM and INM demonstrations as compared to local check. Integrated Weed and Nutrient management in garlic gave 19.05% yield increase against local check. Ginger and turmeric crops demonstration with ICM, IDM and



management of rhizome shoot borer gave 12.93% increased yield in ginger and 14.23% increase in

yield of turmeric as compared to their local checks.

**Table 46: Frontline demonstrations on spice crops conducted in the state of Karnataka**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Black pepper</b>									
Integrated Disease Management	Uttara Kannada	Paniyur-1	10	1.0	7.98	6.5	22.77	7.19	6.68
Foliar nutrition	Chikkamagalur	Panniyur-1	15	3.0	9.0	8.0	12.50	2.76	2.55
Integrated Disease Management	Chikkamagalur	Panniyur-1	15	1.0	8.0	7.2	11.11	2.82	2.20
Integrated Nutrient Management	Kodagu	Panniyur-1	10	0	8.21	7.47	9.91	3.75	3.60
Integrated Disease Management	Dakshina Kannada	Penniyur-1	10	1	22.68	14.39	57.61	7.65	5.08
Integrated Crop Management	Udupi	Panniyur-1	15	2.0	3.17	2.39	32.64	2.20	2.03
Integrated Disease Management	Udupi	Panniyur-1	10	1.0	2.23	1.69	31.95	1.93	1.64
Integrated Disease Management	Dakshina Kannada	Local	10	0	3.5	–	9.38	–	–
			<b>95</b>	<b>9.0</b>	<b>6.13</b>	<b>5.22</b>	<b>95.00</b>	<b>3.04</b>	<b>2.81</b>
Value addition in Pepper	Hassan	Panniyur	5	5	34.5	32	7.81	33.39	61.44
<b>Chilli dry</b>									
Integrated Crop Management	Bellary	Byadagi	5	2	20.25	18.75	8.00	3.38	2.66
Integrated Crop Management	Dharwad	Byadagi dabbi	10	4.0	13.2	11.63	13.50	2.89	2.63
Integrated Crop Management	Kalaburagi	HPH (1900)	5	1.0	36.75	31.25	17.60	1.56	1.14
Integrated Nutrient Management	Hassan	Hassan local	10	4.0	8.48	7.55	12.32	3.35	3.26
Integrated Crop Management	Chikkamagalur	Byadgi dabbi	12	4.8	3.99	3.5	14.00	1.84	1.75
			<b>42</b>	<b>15.8</b>	<b>11.59</b>	<b>10.27</b>	<b>12.92</b>	<b>2.67</b>	<b>2.43</b>
<b>Garlic</b>									
Integrated Weed & Nutrient Management	Belagavi	Rajelli Gaddi	5	2.0	62.5	52.5	19.05	3.57	2.62
<b>Ginger</b>									
Integrated Disease Management	Uttara Kannada	Himachal	10	1.0	105.76	84.49	25.17	3.20	2.67
Management of shoot borer and rhizome rot	Shimoga	Riode geniro	10	4.0	338	275.5	22.69	2.80	2.06
Management of Shoot Borer in Ginger	Hassan	Rio – de- Janaero	14	5.6	140.1	135	3.78		
			<b>34</b>	<b>10.6</b>	<b>211.54</b>	<b>183.25</b>	<b>12.93</b>	<b>3.00</b>	<b>2.36</b>
Integrated Crop Management	Chamrajanagar	Alleppy Supreme	5	0.4	310.2	209	48.42	2.90	1.86
Integrated Crop Management	Kalaburagi	Selam	10	4.0	155.4	136	14.26	2.39	2.18
			<b>49</b>	<b>15.0</b>	<b>199.20</b>	<b>171.34</b>	<b>14.23</b>	<b>2.84</b>	<b>2.30</b>
<b>State Total</b>			<b>196</b>	<b>46.8</b>					



**Tamil Nadu:** A total of 112 frontline demonstrations were conducted in spice crops like ginger, turmeric, dry chilli, coriander and garlic covering an area of 37 ha during the year by KVKs of Tamil Nadu (Table 41). The ICM demonstration in ginger and turmeric crops has undoubtedly emerged as superior technology by recording an increase in yield ranging from 17.86% to 65.85% in ginger and 5.31 to 53.65% in turmeric over their local check. In turmeric,

BSR-2 variety demonstration gave 48.34% increased yield as compared to local check. Drought management technology and resource conservation technology demonstration in dry chilli gave an increase in yield by 19.07% as against check. Similarly, garlic under ICM gave 16.93% yield increase over local check. The coriander variety Co-4 gave an impressive 30.60% increase in yield as compared to local check with a BCR of 3.61.

**Table 47 : Frontline demonstrations on spice crops conducted in the state of Tamil Nadu**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Ginger</b>									
Integrated Crop Management	Erode	Varadha	2	1	99	84	17.86	1.97	1.56
Integrated Crop Management	Kanyakumari	Vardha	10	4	170	102.5	65.85	2.86	1.85
			<b>12</b>	<b>5</b>	<b>155.80</b>	<b>98.80</b>	<b>56.25</b>	<b>2.68</b>	<b>1.79</b>
<b>Turmeric</b>									
Crop Management	Cuddalore	Erode local	5	2.5	85.62	75.5	13.40	4.45	5.51
Integrated Crop Management	Perambalur	Co 2	5	1	295	192	53.65	2.65	2.04
Integrated Crop Management	Dharmapuri	Co 2	5	2.5	255	217.5	17.24	6.83	5.92
Integrated Crop Management	Salem	Co2	10	5	25.8	24.5	5.31	2.42	2.30
Integrated Crop Management	Coimbatore	Co-2	10	2	55.48	46.08	20.40	3.11	2.25
Integrated Pest Management	Thiruvannamalai	Erode local	10	4	215.57	184.47	16.86	2.69	2.16
Variety Introduction	Tiruvarur	BSR 2	10	2	31.3	21.1	48.34	3.48	2.64
			<b>55</b>	<b>19</b>	<b>235.11</b>	<b>202.51</b>	<b>19.04</b>	<b>3.52</b>	<b>3.19</b>
<b>Chilli dry</b>									
Drought Management	Tuticorin	VKM – Mundu	20	4	6.15	5.38	14.31	2.94	2.72
Resource Conservation Technologies	Kanyakumari	Local variety	10	4	13.15	10.62	23.82	2.18	1.78
			<b>30</b>	<b>8</b>	<b>9.65</b>	<b>8.00</b>	<b>19.07</b>	<b>2.56</b>	<b>2.25</b>
Varietal evaluation	Virudhunagar	Co4	10	4	5.42	4.15	30.60	3.61	2.87
<b>Garlic</b>									
Integrated Crop Management	The Nilgiris	Local	5	1	126.18	107.91	16.93	2.31	1.68
<b>State Total</b>			<b>112</b>	<b>37.0</b>					



**Puducherry:** The Co-4 variety of coriander introduction in the state of Puducherry gave 13 q/ha yields with BCR of 1.24 under spices (Table 48).

**Table 48 : Frontline demonstrations on spice crops conducted in the state of Puducherry**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Coriander</b>									
Introduction of variety	Karaikal	Co-4	10	0.2	13	0		1.24	

**Kerala:** During the year, spice crops such as black pepper, cardamom, ginger and nutmeg were demonstrated under frontline technologies by KVKs of Kerala in 80 farmers' fields covering an area of 10.2 ha (Table 49). Demonstration of INM in adult black pepper has resulted in increased yield by 23.81% as compared to local check. In cardamom, INM and IPM technologies

demonstration resulted in 30% increased yield as compared to local check with better BCR. Integrated Disease Management and organic farming technology in ginger also recorded 11.11% increase in yield over local check. In nutmeg, ICM demonstration gave 75% increased yield over local check with BCR of 6.56.

**Table 49 : Frontline demonstrations on spice crops conducted in the state of Kerala**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Black pepper</b>									
Integrated Nutrient Management	Idukki	Karimunda	10	0.2	2.6	2.1	23.81	3.54	2.52
<b>Cardamom</b>									
Integrated Nutrient Management	Idukki	Njallani	10	0.1	9.9	8	23.75	3.57	2.00
Integrated Pest Management	Idukki	Njallani	10	4	13.50	9.12	48.03	2.91	2.11
Integrated Pest Management	Idukki	Njallani	10	1	16.20	9.90	63.64	2.69	1.90
<b>Ginger</b>									
Integrated Disease Management	Kozhikode	Varada	10	0.2	147.05	145	1.41	1.91	1.80
Integrated Disease Management	Wynad	Maran	10	0.5	111.2	102.5	8.49	1.33	1.12
Organic Farming	Kollam	Varada	10	0.2	163	128	27.34	1.75	1.43
<b>Nutmeg</b>									
Integrated Crop Management	Kottayam	Local	10	4	17500	10000	75.00	6.56	3.33
State Total			80	10.2					



**Fruit crops:** A total of 473 demonstrations on major fruit crops like banana, grapes, citrus, mango, orange, papaya, pine apple, pomegranate, acid lime and guava were conducted in Karnataka, Tamil Nadu and Kerala states covering an area of 153.6 ha during the year. The state wise and KVK wise results are as under:

**Karnataka:** A total of 187 demonstrations on various fruit crops like banana, citrus, grapes, mango, pomegranate, papaya and pineapple were conducted in 65.6 ha area (Table 50). The results indicated that the yield was substantially higher under demonstration of ICM, IDM and INM

technologies in banana G-9 variety with BCR as high as 4.79 against 3.89 under local check. In mango, 17 demonstrations conducted on INM, IPDM and soil and water conservation technology revealed an increase of 16.43% over farmers' practice. The yield increase recorded as compared to farmers' practice was 58.24% in citrus, 39% in orange, 16.18 % in pineapple and 24.08% in pomogranate as compared to local checks. In grapes, IDM in Thomson seedless gave 22.68% yield increase over local check while it was only 6.08% in Bangalore Blue variety under INM demonstration.

**Table 50: Frontline demonstrations on fruit crops conducted in the state of Karnataka**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Banana</b>									
Integrate Nutrient Management	Bidar	G-9	12	5	807.8	674.3	19.80	8.91	7.97
Integrated Crop Management	Belagavi	G-9	10	4	745	614.5	21.24	4.26	3.54
Integrated Crop Management	Kalaburagi	G-9	12	5	707.5	564.1	25.42	4.66	3.96
Integrated Disease Management	Mysore	G9	10	4	310.6	245	26.78	2.49	1.77
Integrated Disease Management	Belagavi	G-9	5	2	480	430	11.63	4.15	3.62
Integrated Disease Management	Davanagere	G-9	15	6	551.8	438.4	25.87	3.80	2.82
Integrated Nutrient Management	Hassan	G.9	10	4	602.5	547.5	10.05	4.43	2.91
			<b>74</b>	<b>30</b>	<b>615.96</b>	<b>510.35</b>	<b>21.23</b>	<b>4.79</b>	<b>3.89</b>
Integrated Nutrient Management	Kodagu	Nendran	10		822	738	11.38	3.55	2.94
Nutrient Management	Chitradurga	Putta Bale	2	0.8	210	140	50.00	7.50	4.78
Integrated Nutrient Management	Mandya	Elakki	10	2	266	210	26.67	3.25	1.68
			<b>12</b>	<b>2.8</b>	<b>250.00</b>	<b>190.00</b>	<b>33.33</b>	<b>4.46</b>	<b>2.57</b>
<b>Grapes</b>									
Integrated Disease Management	Bagalkot	Thompson Seedless	10	4	147.21	120	22.68	2.44	2.05
Integrated Nutrient Management	Bengaluru Rural	Bangalore Blue	10	1	350.2	337.8	3.67	3.06	2.75
Integrated Nutrient Management	Chikkaballapura	Bangalore Blue	10	4	471	441.5	6.68	5.79	5.47
			<b>30</b>	<b>9</b>	<b>446.84</b>	<b>420.76</b>	<b>6.08</b>	<b>5.25</b>	<b>4.93</b>

(Contd...)



Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Citrus</b>									
Integrated Disease Management	Kalaburagi	Kagzi lime	5	1	126.5	102.5	23.41	11.43	8.20
Integrated Pest and Disease Management	Vijayapura	Kagzi	6	2.4	19.1	17.3	10.40	2.56	2.18
Integrated Crop Management	Kalaburagi	Kagzi Lime	12	5	132.5	92.5	43.24	3.93	3.20
			<b>23</b>	<b>8.4</b>	<b>99.39</b>	<b>116.69</b>	<b>58.24</b>	<b>4.43</b>	<b>3.50</b>
<b>Mango</b>									
Integrated Nutrient Management	Davanagere	Alphanso	2	1	172.7	148.5	16.30	4.15	4.09
Integrated Pest & Disease management	Bengaluru Rural	Raspuri	5	1	24.17	18.83	28.36	4.23	3.24
Soil & Water Conservation	Ramanagaram	Mallika & Badami	10	2	21	19	10.53	3.31	2.96
			<b>17</b>	<b>4</b>	<b>59.72</b>	<b>51.33</b>	<b>16.43</b>	<b>3.75</b>	<b>3.31</b>
<b>Orange</b>									
Integrated Crop Management	Kodagu	Coorg Mandarin	7	2	69.5	50	39.00	1.91	1.63
<b>Papaya</b>									
Integrated Crop Management	Bellary	Red lady-786	5	2	87.5	86	1.74	4.45	4.21
Variety introduction	Tumkur	Arka Prabhat	3	1	867.8	752.6	15.31	4.41	3.80
			<b>8</b>	<b>3</b>	<b>347.60</b>	<b>308.20</b>	<b>6.27</b>	<b>4.44</b>	<b>4.07</b>
<b>Pineapple</b>									
Management of Heart rot	Shimoga	Kew	5	2	505.4	435	16.18	3.32	2.98
<b>Pomegranate</b>									
Integrated Pest & Disease Management	Chitradurga	Bhagava	5	2	10.7	7.67	39.50	4.10	2.41
Integrated Pest Management	Vijayapura	Kesar	6	2.4	10.2	9.17	11.23	4.06	3.57
			<b>11</b>	<b>4.4</b>	<b>10.43</b>	<b>8.49</b>	<b>24.08</b>	<b>4.08</b>	<b>3.04</b>
<b>State Total</b>			<b>187</b>	<b>65.6</b>					

**Tamil Nadu:** Under fruits, demonstrations in banana, mango, guava and acid lime were conducted in 149 farmers' fields covering an area of 52 ha during year by KVKs of Tamil Nadu (Table 51). In banana, improved technologies like ICM, IPDM and IPM demonstrations have shown their superiority in farmers' fields by registering over 20.79% yield increase and higher BCR as compared to their local check. Similarly, in mango INM, ICM, cropping systems and IPM

demonstrations have recorded higher yield as against their respective local check. The processing and value addition by ripening technique in mango gave an economic return of Rs 2.0 for every rupee spent. The acid lime demonstration with ICM also gave higher yield of 128.87 q/ha as against 105.28 q/ha in local check. The guava variety Lucknow-49 recorded 29.30% higher yield as compared to local check with BCR of 2.69.



**Table 51: Frontline demonstrations on fruit crops conducted in the state of Tamil Nadu**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Acid lime</b>									
Integrated Crop Management	Dindigul	Local	15	4	128.87	105.28	22.41	3.88	3.18
<b>Banana</b>									
Crop Management	Cuddalore	Poovan	5	2.5	452	348	29.89	3.32	2.70
Integrated Crop Management	Theni	Grand Naine	10	4	495.5	406.4	21.92	2.99	2.41
Integrated Crop Management	Kanyakumari	Nendran	10	4	275	214	28.50	2.94	2.56
Integrated Crop Management	Salem	Udhayam	4	0.5	243.2	225	8.09	4.92	3.94
Integrated Disease Management	Tuticorin	Local	10	4	25.84	21.41	20.69	3.54	3.12
Integrated Pest and Disease Management	Villupuram	Monthan	10	5	74.89	67.77	10.51	3.25	2.79
			<b>49</b>	<b>20</b>	<b>240.57</b>	<b>194.43</b>	<b>20.79</b>	<b>3.25</b>	<b>2.75</b>
<b>Guava</b>									
Crop improvement	Villupuram	Lucknow 49	10	2	32.57	25.19	29.30	2.69	2.27
<b>Mango</b>									
Cropping Systems	Pudukottai	Imampasanth	20	4	56.72	46.14	22.93	2.35	2.18
Integrated Crop Management	Dindigul	Bangalora	15	6	122.3	103.34	18.35	3.16	2.50
Integrated Crop Management	Kanyakumari	Neelam	10	4	175	142	23.24	0.33	2.39
Integrated Nutrient Management	Erode	Bangalura	10	4	88.98	75.28	18.20	6.80	6.48
Integrated Pest Management	Thiruvallur	Banganapalli	10	2	143.5	112.2	27.90	11.48	8.54
Integrate Pest Management	Vellore		5	4	209	132	58.33	2.78	1.92
			<b>70</b>	<b>24</b>	<b>130.82</b>	<b>101.09</b>	<b>27.36</b>	<b>4.28</b>	<b>3.50</b>
Processing and Value Addition-Ripening	Madurai	Mixed varieties	5	2	17	14	21.43	2.00	1.39
<b>State Total</b>			<b>149</b>	<b>52</b>					

**Kerala:** Among fruit crops of Kerala, banana and mango were demonstrated with frontline technologies by KVKs of Kerala in 137 fields of farmers covering an area of 36 ha (Table 52). In banana, ICM, INM and IPM demonstrations performed better with overall increase of 26.53% in yield as against local check. The BCR was also

better with 2.11 as against 1.73 in check. In mango, IPM demonstration could enhance the fruit yield by 27.50 % as compared to local check. The straw berry demonstrated with ICM technology in the Wynad district gave 21.50% yield increase with BCR of 1.79

**Table 52: Frontline demonstrations on fruit crops conducted in the state of Kerala**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Banana</b>									
Integrate Integrated Crop Management	Idukki	Nendran	5	1	296	185	60.00	2.00	1.17
Integrated Crop Management	Kollam	Nendran	20	0.8	182	135	34.81	1.78	1.36
Integrated Crop Management	Kottayam	Nendran	10	0.4	2780	2450	13.47	2.14	1.84
Integrated Nutrient Management	Idukki	Nendran	10	1	288	227	26.92	1.90	1.43
Integrated Nutrinet Management	Pathanamthitta	Nendran	5	2	261	204	27.50	1.94	1.61
Integrated Pest Management	Palghat	Nendran	10	1	22	19.2	14.58	2.86	2.41
Integrated Nutrient Management	Kasaragod	Nendran	5	4	280	232.5	20.43	2.18	1.86
Integrated Pest Management	Kasaragod	Nendran	10	4	302.1	238	26.93	2.35	2.01
Productivity improvement	Trivandrum	Nendran	2	1	219	193	13.23	1.51	1.30
Integrated Crop Management	Wynad	Kadali	10	0.8	182	130	40.00	1.46	1.13
			<b>87</b>	<b>16</b>	<b>254.92</b>	<b>201.67</b>	<b>26.53</b>	<b>2.11</b>	<b>1.73</b>
Integrated Pest Management	Palghat	Alponsa, Neelam, Sindhoori	45	20	51	40	27.50	2.16	1.88
<b>Straw berry</b>									
Crop Management	Wynad	Winter don	5	0.02	143	1178	21.50	1.79	1.47
			<b>State Total</b>	<b>137</b>	<b>36.0</b>				

**Plantation crops:** A total of 145 demonstrations were undertaken by the KVKs of Karnataka, Tamil Nadu, Goa and Kerala states on major plantations like arecanut, coconut, coffee, cashew, cocoa and tea covering an area of 110 ha during the year. The state wise and KVK wise results are discussed as under:

**Karnataka:** A total of 60 demonstrations on plantation crops like arecanut, coconut and coffee were conducted in 25 ha area by KVKs of Karnataka state (Table 53). The overall yield increase recorded in demonstrations as compared to farmers' practice was 22.98% due to ICM (37.79%), INM (11.38%) and root grub management (27.06%) in arecanut. In coconut, ICM and IPM demonstrations have given 35.77% higher nut yield as compared to check. In coffee, stem borer management with healer and sealer technology gave 9.82% higher berry yield.

However, the BCR was low with demonstration as compared to check due to cost of stem borer control. This may improve over the years due to less damage in coffee plants and higher berry yield.



**FLD on root grub management in arecanut plantation at Shimoga district**

**Table 53: Frontline demonstrations on plantation crops conducted in the state of Karnataka**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Arecanut</b>									
Integrated Crop Management	Uttara Kannada	Local	10	4	29.9	21.7	37.79	8.52	6.69
Integrated Nutrient Management	Tumkur	Local	10	4	13.7	12.3	11.38	3.43	3.21
Management of Root grub	Shimoga	Sagar local	5	2	10.8	8.5	27.06	6.25	5.82
Integrated Nutreint Management	Tumkur	Hirehalli local	5	2	9.54	8.48	12.50	4.90	4.54
			<b>30</b>	<b>12</b>	<b>17.92</b>	<b>14.16</b>	<b>22.98</b>	<b>5.84</b>	<b>5.02</b>
<b>Coconut</b>									
Integrated Crop Management	Davanagere	KDM-1	6	2	11733	6183	89.76	2.96	1.93
Integrated Pest Management	Tumkur	Arsikere tall	10	4	9920	9120	8.77		
			<b>16</b>	<b>6</b>	<b>10524</b>	<b>8141</b>	<b>35.77</b>	<b>2.53</b>	<b>1.98</b>
Introducing Healer & sealer mixture for addressing white stem borer management	Chikkamagalur	Arabica	14	7.0	7.94	7.23	9.82	3.71	3.81
<b>State Total</b>			<b>60</b>	<b>25</b>					

**Goa:** Demonstration of integrated pest control in cashew plantations in the state of Goa in about 2 ha area of 10 farmers garden has revealed 45.59%

increase in cashew nut yield with BCR of 4.22 as compared to 3.53 in local check (Table 54).

**Table 54 : Frontline demonstrations on plantation crops conducted in the state of Goa**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Cashew</b>									
Integrated Pest Management	North Goa	Local	10	2	14.37	9.87	45.59	4.22	3.53

**Tamil Nadu:** Frontline technologies were demonstrated in cashew, cocoa, coconut and tea in 45 farmers' fields covering an area of 11.2 ha by the KVKs in Tamil Nadu (Table 55). Demonstration of healer cum sealer in cashew gave 14.57% increased yield with better BCR of

2.69 as against 2.49 in local check. IPM demonstration in coconut gave only 0.88% increase nut yield over base yield. In tea, technology demonstration on nutrient management gave 12.59% increase in tea leaf yield over local check. However, in case of



speciality tea demonstration the quality leaf yield was less as compared local check. But the BCR was higher with 2.18 as compared to normal tea with only 1.50 BCR. This is mainly on account of

better price for the speciality tea in the market. The ICM demonstration in cocoa has shown better results in terms of yield and economic returns.

**Table: 55 Frontline demonstrations on plantation crops conducted in the state of Tamil Nadu**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Cashew</b>									
Demonstration of Healer cum Sealer	Pudukottai	Local	10	1	4.56	3.98	14.57	2.69	2.49
Coconut Integrated Pest Management	Tuticorin	Local	20	4	17785	17630	0.88		
<b>Tea</b>									
Nutrient Management	The Nilgiris	Clone B/6/61	3	1.2	268.91	238.84	12.59	1.27	1.25
Value addition-Specialty tea	The Nilgiris	Clone B/6/61	2	1	73.28	75	-2.29	2.18	1.50
<b>Cocoa</b>									
Integrated Crop Management	Kanyakumari	Forestero	10	4	825	625	32.00	3.57	2.43
State Total			45	11.2					

**Kerala:** The two important plantation crops of Kerala such as coconut and cocoa were demonstrated with frontline technologies in 30 fields of farmers covering an area of 4.8 ha during the year (Table 56). Technologies like drought management, IPDM and IDM in coconut have shown the superiority of technology with

increased yield up to 3.54 % over local check. In cocoa, resource management in the cocoa plantation expressed over 200% increase in bean yield as compared to farmers' practice. However, BCR was less with technology demonstration due extra cost on resource conservation.

**Table: 56 Frontline demonstrations on plantation crops conducted in the state of Kerala**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Coconut</b>									
Drought management	Trivandrum	WCT	10	2	8152	6205	31.38	1.16	
Integrated Disease Management	Kannur	WCT	7	0.4	5400			0.70	
IPDNM	Ernakulam	WCT	3	0.4	8195	5000	63.90	1.38	
State Total			20	2.8	7765	5146	31.54	1.13	
Resource management	Kasaragod	Forestero	10	2	585	195	200	0.52	0.90



**Aromatic and flower crops:** A total of 186 demonstrations on frontline technologies were organized by KVKs of Karnataka and Tamil Nadu under Zone-VIII during the year. The state wise and KVK wise results are discussed as under:

**Karnataka:** During the year, 47 demonstrations on flower crops like chrysanthemum, gailardia, jasmine and marigold and aromatic crop such as

davana were conducted in 10.3 ha area by the KVKs of Karnataka (Table 57). The yield increase recorded under FLDs as compared to farmers' practice was 24.73 % in davana, 25.35% in chrysanthemum, 11.76% in gailardia, 24.68% in jasmine and 20.89% in marigold with higher BCR of 5.01, 3.29, 4.33, 4.79 and 6.08 respectively as compared to their local checks.

**Table: 57 Frontline demonstrations on aromatic and flowers conducted in the state of Karnataka**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Davana</b>									
Integrated Crop Management	Kolar	Local	5	1	11.35	9.1	24.73	5.01	4.69
Chrysanthemum									
Integrated Pest & Disease Management	Chitradurga	Chandani local	5	2.5	8.71	6.82	27.71	2.94	2.00
Integrated crop management	Chitradurga	Chandani local	5	2	820	670	22.39	3.73	3.52
			10	4.5	848.33	676.67	25.35	3.29	2.67
<b>Gailardia</b>									
Integrated Crop Management	Belagavi	DGS-1	10	4	95	85	11.76	4.33	4.05
<b>Jasmine</b>									
Integrated Crop Management	Dakshina Kannada	Udupi Mallige	10	0.5	60.48	48.51	24.68	4.79	4.05
<b>Marigold</b>									
Integrated Crop Management	Bidar	Private variety	3	0.3	6.25	5.17	20.89	6.08	5.24
<b>State Total</b>			<b>47</b>	<b>10.3</b>					

**Tamil Nadu:** A total of 139 demonstrations were conducted on major flowers such as crossandra, ixora, jasmine, marigold, liliun, tuberose and davana under aromatic crop covering an area of 48.75 ha during the year (Table 58). Introduction of cv. PKM-1 in davana gave 62.86% higher foliage yield as compared local check. In crossandra, introduction of cv. Arka Ambara gave 64.84% increased flower yield with BCR of 6.99 as compared to check. The weed

management technology demonstration in ixora resulted in 6.79% yield increase as against check. The ICM and IPM demonstrations in jasmine have enhanced the flower production by 29.42% over local check. The cultivation of liliun under cropping systems gave higher BCR of 2.50 in the Nilgiris district. IPDM and cv. East West demonstration together gave an increase of 76.01% flower yield in marigold as compared to local check. In tuberose, technologies such as



ICM, INM, IPM and adoption in cropping systems gave 53.84% increase in flower yield

with higher BCR of 2.18 as against only 1.83 in local check.

**Table: 58 Frontline demonstrations on aromatic and flowers conducted in the state of Tamil Nadu**

Thematic Area	KVK	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C ratio	
					Demo	Check		Demo	Check
<b>Davana</b>									
Variety Introduction	Kanyakumari	PKM-1	10	4	17.1	10.5	62.86	2.96	1.67
Crossandra									
Variety Introduction	Dharmapuri	Arka Ambara	5	0.25	105	63.7	64.84	6.99	6.89
Ixora									
Integrated Weed Management	Karur		10	2	23.78	22.27	6.79	2.17	1.79
<b>Jasmine</b>									
Integrated Crop Management	Perambalur	Ramanathapuram local	10	2	105.2	35.91	71.07	3.57	2.50
Integrated Pest Management	Erode	Gundumalli	10	4	84.92	78.02	8.84	2.57	2.41
Integrated Pest Management	Karur	Local	10	2	150.08	139.48	7.60	2.99	2.38
Integrated Crop Management	Vellore		10	4	55.68	39.75	40.08	2.60	1.89
			<b>40</b>	<b>12</b>	<b>89.40</b>	<b>68.49</b>	<b>29.42</b>	<b>2.82</b>	<b>2.25</b>
Cropping Systems	The Nilgiris	Oriental Lilium	4	5000 Sq.m	20000 flower s/500 sq.m	18400 flowers /500 Sq.m		2.50	1.33
<b>Marigold</b>									
Integrated Pest and Disease Management	Kanyakumari	Pusa Narangi Gainda	10	4	26.22	17.72	47.97	2.83	3.48
Crop improvement	Villupuram	East west	10	2	195.2	84.1	132.10	3.31	1.99
			<b>20</b>	<b>6</b>	<b>239.73</b>	<b>146.03</b>	<b>76.01</b>	<b>2.99</b>	<b>2.98</b>
Integrated Crop Management	Perambalur	local	10	4	97	78.7	23.25	3.20	2.71
Integrated Crop Management	Kanyakumari	Prajwal	10	4	59.5	35.7	66.67	2.82	1.78
Integrated Nutrient Management	Villupuram	Bejowal	10	2	68.4	46.1	48.37	2.62	1.80
Integrated Pest Management	Salem	Local	10	4	98.2	70.8	38.70	1.98	1.41
Cropping Systems	Pudukottai	Arka Niranthara	10	10	125.4	74.6	68.10	1.50	1.66
			<b>50</b>	<b>24</b>	<b>100.40</b>	<b>65.79</b>	<b>53.84</b>	<b>2.18</b>	<b>1.83</b>
<b>State Total</b>			<b>139</b>	<b>48.75</b>					

**Hybrids:** During the year, 889 demonstrations on hybrids in various crops were conducted by the KVKs of Zone-VIII in the states of Karnataka, Tamil Nadu, Puducherry and Kerala covering 301.28 ha area in crops like paddy, maize,

sorghum, sesamem, sunflower, castor, cotton, chilli, brinjal, bhendi, cabbage, cauliflower, tomato, bottle gourd, onion, watermelon, tuberose and sericulture. The State-wise and KVK wise results are discussed as under:



**Karnataka:** A total of 523 demonstrations were conducted by KVKs of Karnataka in various crop hybrids as presented in Table 59. In cereals, the yield increase in hybrid demonstrations was 13.50 % in paddy and 15.34 % in maize. The prominent hybrids emerged in maize were Ganga Kaveri, Hema, 900M Gold, CP 848, 25K-55, Nithyashree, NK 6240, seed tech and Kaveri 25. In paddy, KRM-4 was hybrid emerged as high yielder in the state of Karnataka. In oilseeds, hybrid DSS-9 in sesamum and sunflower hybrids such as cargil hybrid, KBSH-53 have recorded 22.12% increase

in yield over local checks. Bt cotton hybrids have outyielded varieties by registering 24.98% increase in yield. In vegetables, the increase in yield recorded in hybrids over varieties was 39.42% in bottle gourd, 25.05% in brinjal, 27.85% in cabbage, 10.29% in cauliflower, 15.69% in chilli, 26.99% in tomato and 23.27% in watermelon crops. In bajra, 86M52 hybrid recorded an increased yield by 33.87% over ruling variety. In sericulture, hybrid cocoon rearing resulted in 5.66% higher cocoon yield with BCR of 3.28 as against 2.62 in other varieties.4. FLD plot of Jasmine at Thiruvannamalai.jpg

**Table: 59 Frontline demonstrations on hybrids conducted in the state of Karnataka**

Crop	District Name	Name of Hybrid	Farming Situation	No. of farmers	Area (ha)	Average yield (q/ha)		% increase over check	B:C ratio		
						Demo	Check		Demo	Check	
Maize	Koppal	Ganga Kaveri	Irrigated	10	4	56.58	51.95	8.91	1.68	1.67	
	Bagalkot	GH-727	Irrigated	10	4	49	52	-5.77	4.97	5.10	
	Mandya	Hema	Irrigated	7	3.5	68.53	61.45	11.52	2.18	1.87	
	Vijayapura	900M Gold	Irrigated	15	6	62.2	51.4	21.01	3.87	3.37	
	Gadag	CP 848	Protective irrigation	15	6	47.81	36.02	32.73	1.98	1.70	
	Belagavi	25 K-55	Rainfed	5	2	55.8	50	11.60	2.08	1.94	
	Hassan	Ganga Kaveri	Rainfed	10	4	62.5	57.1	9.46	2.99	2.86	
	Mysore	Nithyashree	Rainfed	10	4	25.1	24.4	2.87	2.90	1.41	
	Davanagere	NK6240	Rainfed	20	8	48.3	40.8	18.38	1.46	1.34	
	Dharwad	Seedtech-740	Rainfed	10	4	66.23	58.33	13.54	2.24	2.09	
Bellary	Kaveri-25	Irrigated	10	4	76.5	68.2	12.17	2.18	1.86		
				<b>122</b>	<b>49.5</b>	<b>60.25</b>	<b>53.05</b>	<b>15.34</b>	<b>2.78</b>	<b>2.45</b>	
Paddy	Mysore	KRH 4	Irrigated	3	1.2	72	45	60.00	2.99	2.00	
	Mandya	KRH-4	Irrigated	10	5	83.3	76.7	8.60	4.11	3.26	
	Hassan	KRH-4	Irrigated	10	4	78.4	74.2	5.66	1.79	2.54	
				<b>33</b>	<b>10.2</b>	<b>80.05</b>	<b>71.99</b>	<b>13.50</b>	<b>3.07</b>	<b>2.83</b>	
Sesame	Koppal	DSS-9	Rainfed	5	2	2.35	1.8	30.56	2.61	1.69	
	Sunflower	Shimoga	Cargil SH3859	Irrigation	6	2.4	20.63	18.75	10.03	3.84	3.60
		Kalaburagi	Cargil 671	Rainfed	12	5	12.2	9.8	24.49	3.51	2.87
		Bagalkot	KBSH-53	Rainfed	10	4	15.8	12.5	26.40	2.97	2.56
				<b>28</b>	<b>11.4</b>	<b>15.24</b>	<b>12.63</b>	<b>22.12</b>	<b>3.39</b>	<b>2.92</b>	
Bt. Cotton	Uttara Kannada	BG-II	Rainfed	10	4	26.12	23.5	11.15	4.01	3.62	
	Gadag	Kanaka, Niraj	Rainfed	20	8	14.4	11.5	25.22	1.54	1.26	
	Belgavi	MRC-7347	Rainfed	10	4	20.6	15.8	30.38	2.95	2.32	
	Vijayapura	Kanaka/Jadoo	Irrigated	15	6	18.17	16.04	13.28	3.97	3.57	
	Bellary	Jadoo	Irrigated	10	4	34.8	30.2	15.23	1.99	1.61	
	Haveri	Kanaka	Rainfed	10	4	17.2	12.75	34.90	2.19	1.82	
	Dharwad	Kanaka/Jailaum	Rainfed	10	4	16.58	13.74	20.67	1.56	1.34	
	Davanagere	MR-375	Rainfed	20	8	18.6	16.2	14.81	2.37	2.69	
				<b>105</b>	<b>42</b>	<b>24.54</b>	<b>20.64</b>	<b>24.98</b>	<b>3.11</b>	<b>2.82</b>	

(Contd...)



## ICAR-ZPD, Zone VIII, Bengaluru

Crop	District Name	Name of Hybrid	Farming Situation	No. of farmers	Area (ha)	Average yield (q/ha)		% increase over check	B:C ratio	
						Demo	Check		Demo	Check
Bottle gourd	Chikkaballapura	MGH-4	Irrigated	5	2	290	208	39.42	2.76	1.78
Brinjal	Koppal	Buldozer	Irrigated	5	2	475	400	18.75	3.04	23.78
	Kalaburagi	Mahyco-10	Irrigated	5	2	202.2	186.9	8.19	5.96	4.21
	Koppal	Mayco-11	Irrigated	5	2	374	237	57.81	3.33	2.23
	Belagavi	MEBH-10 (Mahyco)	Rainfed	5	2	485	420	15.48	2.15	1.75
					<b>20</b>	<b>8</b>	<b>384.05</b>	<b>310.98</b>	<b>25.05</b>	<b>3.62</b>
Cabbage	Belgavi	Saint	Irrigated	10	2	234	161	45.34	2.39	1.43
	Chikkaballapura	Unnathi	Irrigated	5	2	677	590.25	14.70	3.53	2.43
	Kolar	Unnati	Irrigated	4	0.8	490	418.7	17.03	2.10	1.78
				<b>19</b>	<b>4.8</b>	<b>461.25</b>	<b>382.80</b>	<b>27.85</b>	<b>2.82</b>	<b>1.91</b>
Cauliflower	Bengaluru Rural	Suhasini	Irrigated	5	1	268.4	246.1	9.06	3.07	2.77
	Chikkaballapur	Suhasini	Irrigated	5	2	549.5	495.5	10.90	3.82	3.46
				<b>10</b>	<b>3</b>	<b>455.80</b>	<b>412.37</b>	<b>10.29</b>	<b>3.57</b>	<b>3.23</b>
Chilli	Tumkur	Ulka	Irrigated	5	1	240.7	193.8	24.20	2.36	1.79
	Koppal	US Agri- 1081	Irrigated	5	2	265	237.8	11.44	7.73	7.51
				<b>10</b>	<b>3</b>	<b>256.90</b>	<b>223.13</b>	<b>15.69</b>	<b>5.94</b>	<b>5.60</b>
Tomato	Chamrajanagar	Abhilasha	Irrigated	12	4.8	517.5	456	13.49	2.15	1.97
	Chamrajanagar	Abhilasha	Irrigated	10	4	556.2	482	15.39	2.39	2.13
	Chikkaballapur	Alankar	Irrigated	5	1	1139	901	26.42	3.15	1.94
	Mysore	Arka Rakshak	Irrigated	10	4	638.6	478.5	33.46	1.18	1.03
	Kolar	Arka Rakshak	Irrigated	3	0.6	516.6	463.3	11.50	1.65	1.46
	Ramanagaram	Arka Rakshak	Irrigated	10	2	683.2	601.83	13.52	2.09	1.84
	Bagalkot	Arka Rakshaka	Irrigated	5	2	351.32	212.8	65.09	1.40	1.06
	Shimoga	Arka Samrat	Irrigated	4	1	748.1	647.3	15.57	3.12	2.66
	Bengaluru Rural	NS-501	Irrigated	5	1	678.2	613.8	10.49	3.67	3.13
	Bangalore Rural	NS-501	Irrigated	5	1	625	584	7.02	3.29	2.74
	Chikkaballapura	US -440	Irrigated	5	1	1139	901	26.42	3.15	1.94
	Mysore	US 800	Irrigated	10	4	267	196.3	36.02	1.75	1.31
	Tumkur	Arka Rakshak	Rainfed	10	2	560	430	30.23	2.99	2.21
	Tumkur	Arka Rakshak	Irrigated	10	2	290	173	67.63	3.32	1.70
Tumkur	Bhoomika	Irrigated	5	1	762.5	665	14.66	4.63	3.49	
Tumkur	Bhoomika	Irrigated	5	2	516.8	436.4	18.42	3.33	2.94	
				<b>114</b>	<b>33.4</b>	<b>536.68</b>	<b>435.98</b>	<b>26.99</b>	<b>2.39</b>	<b>1.90</b>
Watermelon	Chikkamagalur	Girish	Irrigated	10	4	44.2	32.25	37.05	15.92	12.30
	Chitradurga	Hachi Vichi	Irrigated	12	5	48.60	43.30	12.24	3.22	2.91
				<b>22</b>	<b>9</b>	<b>46.64</b>	<b>38.39</b>	<b>23.27</b>	<b>8.87</b>	<b>7.09</b>
Bajra Sericulture	Vijayapura	86M52	Rainfed	15	6	16.6	12.4	33.87	1.64	1.16
	Mandya	CSR 2 x 4	Irrigated	10	1000 DFLs	0.735	0.7	5.00	3.36	2.91
	Belagavi	FC1xFC2	Irrigated	5	500 DFLs	82.56	79.14	4.32	4.17	2.61
	Mandya	PM x CSR 2	Irrigated	10	1000 DFLs	87.2	81.5	6.99	2.74	2.34
				<b>25</b>	<b>2500 DFLs</b>	<b>80.79</b>	<b>76.43</b>	<b>5.66</b>	<b>3.28</b>	<b>2.62</b>
<b>State Total</b>				<b>523</b>	<b>184.3</b>					

**Tamil Nadu:** A total of 344 frontline demonstrations have been conducted covering 115.5 ha area in various crop hybrids by the KVKs of Tamil Nadu state during the year (Table 60). In cereals, hybrids such as CoRH-4

in paddy, CoMH-6 in maize, Co-5 in sorghum have performed superior under frontline demonstrations by registering 21.21%, 20.71% and 20.98% increase in yield respectively over ruling varieties. Among



oilseed crops, Sunbred 275, Co (SFH)-2 in sunflower and YRCH 1 in castor have recorded higher yield over their local check varieties to the extent of 33.32% and 34.93% respectively. The cotton hybrid Viswanath has recorded 13.91% increase in yield over local check variety. Among the vegetables, the increase in yield in

hybrids tested was 48.24% in bhendi, 20% in bitter gourd, 124.04% in bottle gourd, 8.75% in brinjal, 22.96% in snake gourd, 36.07% in tomato and 25.26% in watermelon over check varieties. The chilli hybrid Arka Meghana recorded -12.96 yield as against check variety at Cuddalore district.

**Table: 60 Frontline demonstrations on hybrids conducted in the state of Tamil Nadu**

Crop	District Name	Name of Hybrid	Farming Situation	No. of farmers	Area (ha)	Average yield (q/ha)		% increase over check	B:C ratio	
						Demo	Check		Demo	Check
Maize	Salem	CoHM6	Homestead	12	5	69.6	67.2	3.57	3.34	2.91
	Tuticorin	CoMH 6	Irrigated	10	4	4698	3810	23.31	1.71	1.56
	Ariyalur	CoMH 6	Irrigated	10	4	68.5	50	37.00	2.03	1.49
	Trichirappali	CoMH 6	Irrigated	10	4	74.41	70.95	4.88	2.09	1.81
	Coimbatore	CoMH 6	Irrigated	10	4	69.25	65.78	5.28	1.92	1.69
	Nagapattinam	CoMH 6	Limited irrigation	10	4	57.6	49.5	16.36	2.26	1.83
	Madurai	CoMH 6	Limited irrigation	10	4	76	65	16.92	1.90	1.66
	Pudukottai	CoMH 6	Limited irrigation	10	4	81.8	68.09	20.14	2.65	2.07
	Virudhunagar	CoMH 6	Rainfed	10	4	69.74	54.54	27.87	3.03	2.28
	Virudhunagar	CoMH 6	Rainfed	10	4	66.46	58.36	13.88	2.54	2.36
	Virudhunagar	CoMH 6	Rainfed	12	5	42.97	32.23	33.32	2.64	2.32
	Perambalur	NK6240	Rainfed	10	4	28.5	19.9	43.22	2.65	2.00
	Vellore	CoMH 6	Irrigated	10	4	54.1	52.04	3.96	1.64	1.77
					<b>134</b>	<b>54</b>	<b>438.81</b>	<b>359.08</b>	<b>20.71</b>	<b>2.55</b>
Paddy	Perambalur	CoRH4	Irrigated	10	5	68.24	56.3	21.21	2.63	1.98
Sorghum	Perambalur	Co 5	Rainfed	10	5	23.7	19.59	20.98	2.29	1.48
Castor	Virudhunagar	YRCH1	Rainfed	10	4	15.49	11.48	34.93	4.14	3.84
Sunflower	Perambalur	Sunbred	Homestead	10	4	28.88	19.04	51.68	2.21	1.57
	Trichirappali	CO (SFH) 2	Irrigated	10	4	23.1	20.82	10.95	2.71	2.22
	Kancheepuram	CO (SFH) 2	Irrigated	15	6	25.5	18.75	36.00	3.55	2.71
				<b>35</b>	<b>14</b>	<b>25.78</b>	<b>19.42</b>	<b>33.32</b>	<b>2.93</b>	<b>2.24</b>
Bt.Cotton	Dharmapuri	Viswanath	Rainfed	5	2	13.1	11.5	13.91	2.46	2.39
	Tiruvapur	COBH1	Irrigated	10	2	180	105	71.43	2.66	1.80
	Trichirappali	CoBH1	Irrigated	10	2	144.4	102	41.57	4.49	2.29
	Nagapattinam	CoBH1	Limited irrigation	10	2	220	167	31.74	3.52	2.40
				<b>30</b>	<b>6</b>	<b>181.47</b>	<b>124.67</b>	<b>48.24</b>	<b>3.56</b>	<b>2.16</b>
Bittergourd	Kancheepuram	Vivek	Irrigated	10	2	360	300	20.00	3.30	2.62
	Villupuram	Co(BOG)H1	Irrigated	10	1	373.7	166.8	124.04	2.70	1.48
Bottle gourd										
Brinjal	Dharmapuri	Dhuruva	Irrigated	10	2	1348.5	1240	8.75	9.09	7.24
Chilli	Cuddalore	Arka	Irrigated	10	2	282	324	-12.96	3.42	3.93
		Meghana								
Snakegourd	Thiruvannamalai	Mahyco 1	Irrigated	10	2	417.27	339.35	22.96	2.05	1.50
Tomato	Dharmapuri	Sivam	Irrigated	10	2	216.3	152.2	42.12	2.55	1.65
	Dharmapuri	Sivam	Irrigated	10	0.5	231	188	22.87	1.56	1.33
	Nagapattinam	Co 3	Limited irrigation	10	2	780	585	33.33	2.36	1.91
				<b>30</b>	<b>2.5</b>	<b>468.47</b>	<b>348.53</b>	<b>36.07</b>	<b>2.36</b>	<b>1.73</b>
Watermelon	Dharmapuri	Pakeesha	Irrigated	10	4	546.5	436.3	25.26	6.56	4.77
Chilli dry	Virudhunagar	K2	Irrigated	20	8	29.28	20.4	46.11	4.09	3.66
State Total				<b>344</b>	<b>115.5</b>					



**Puducherry:** Demonstration on bhendi hybrid Sakthi in Karaikal district of Puducherry has recorded 22.94% higher yield as compared local check variety with higher BCR of 2.30 (Table 61).

**Table: 61 Frontline demonstrations on hybrids conducted in the state of Puducherry**

Crop	District Name	Name of Hybrid	Farming Situation	No. of farmers	Area (ha)	Average yield (q/ha)		% increase over check	B:C ratio	
						Demo	Check		Demo	Check
Bhendi	Karaikal	Sakthi	Irrigated	10	1	85.2	69.3	22.94	2.30	2.02

**Kerala:** A total 12 demonstrations conducted on hybrids in bitter gourd and brinjal in about 0.48 ha area have revealed higher yield by 86.32% in bitter gourd hybrid Maya 007 and 90.83% in Neelima hybrid in brinjal in the state of Kerala (Table 62).

**Table: 62 Frontline demonstrations on hybrids conducted in the state of Kerala**

Crop	District Name	Name of Hybrid	Farming Situation	No. of farmers	Area (ha)	Average yield (q/ha)		% increase over check	B:C ratio	
						Demo	Check		Demo	Check
Bittergourd	Ernakulam	Maya 007	Irrigated	2	0.08	17.7	9.5	86.32	3.24	1.70
Brinjal	Alleppey	Neelima	Coconut based	10	0.4	22.48	11.78	90.83	1.70	1.18
State Total				12	0.48					

**Farm Implements and tools:** Farm mechanization was popularized through 121 demonstrations of various farm implements covering an area of 41.8 ha during the year by the KVKs of Zone-VIII. Of which, 87 demonstration on farm implements were conducted by KVKs of Tamil Nadu followed by 22 demonstrations in Kerala and 12 demonstrations in Karnataka. The State-wise details of implements demonstrated are presented in Tables 63 & 64.

**Karnataka:** During the year, two implements were demonstrated by three KVKs covering 12 farmers in the state of Karnataka (Table 63 ). The demonstration on vegetable preservator by KVKs revealed an enhanced shelflife of vegetables to 13 days as compared to 6 days in open conditions. The groundnut decorticator demonstrated in four farmers resulted in the saving of 4 mandays/ha as compared to conventional decortications.

**Table: 63 Frontline demonstrations on farm implements conducted in the state of Karnataka**

KVK	Implement/ Equipment demonstrated	No. of farmers	Area (ha)	No. of labours saved/ha	Name of technology specific parameter	Unit of the parameter	Demo Plot	Check Plot
Dharwad	Vegetable preservator	4			Shelf life of vegetables	Days	13	6
Hassan	Vegetable preservator	4			Shelf life of vegetables	Days	13	6
Mandya	Groundnut decorticator	4	2	4	Mandays	No. of Labour/ha	1	5
State Total		12	2					



**Tamil Nadu:** A total of 9 implements were demonstrated in 87 farmers' fields covering 36.8 ha area by the KVKs of Tamil Nadu (Table 64). The use of SRI power weeder in paddy reduced the operation cost by over 50% as compared to manual weeding. In Thiruvallur, demonstration of paddy transplanter resulted enhanced net returns to farmers (Rs 60424/ha) as compared to manual transplanting (Rs 57158/ha). In groundnut, although use of seed drill and dry land weeder reduced the yield marginally, the

substantial savings in manual labour under demonstration gave higher net returns. The demonstrations on inclined planter in blackgram, tapioca harvester and turmeric harvester at Erode district have provided higher net returns and substantial savings in manual labour in completing the operations. The use of mini mechanical machine to wash carrot and high volume sprayer in tea plantations has yielded substantial savings in manual labour.

**Table: 64 Frontline demonstrations on farm implements conducted in the state of Tamil Nadu**

Implement/ Equipment demonstrated	No. of farmers	Area (ha)	No. of labours saved/ha	Yield - (q/ha)		% increase over check	Net returns (Rs/ha)		Name of technology specific parameter	Demo Plot	Check Plot
				Demo	Check		Demo	Check			
SRI power weeder in Paddy at Coimbatore	10	4		58.05	55.035	5.48	45712	38876	Operational cost (Rs/ha)	2928	6036
Transplanter in paddy at Thiruvallur	7	2.8	66	-	-	-	60424	57158	-	-	-
Seed drill and dry land weeder in groundnut at Vellore	10	4	28	5.165	5.2	-0.67	20445	12550	No. of labours saved over manual operations	67	95
Cotton plucker at Dindigul	5	2	-	-	-	-	-	-	Area covered (ha/hr)	0.1	0.05
Inclined planter in black gram at Erode	10	4	-	7.36	6.44	14.29	31905	24399	No. pods/plant	73	65
Tapioca harvester at Erode	10	4	-	-	-	-	150003	112231	Field capacity (ha/hr)	0.118	0.034
Turmeric harvester at Erode	10	4	-	287.94	-	-	220567	181006	Field capacity (ha/hr)	0.079	0.005
Mini mechanical machine to wash carrot at The Nilgiris	20	2	6	-	-	-	-	-	Cost of washing (Rs/kg)	0.31	0.80
High volume sprayer in tea fields at The Nilgiris	5	10	24	-	-	-	-	-	Cost of labour/day (Rs)	600	1200
<b>State Total</b>	<b>87</b>	<b>36.8</b>									



**Kerala:** A total of 22 demonstrations were conducted on paddy and arecanut to demonstrate the mechanized paddy cultivation and arecanut dehusking by the three KVKs of Kerala state during the year (Table 65). The paddy mechanization demonstrations at Kasaragod and Wynad districts have clearly demonstrated the

efficiency by way of increased yield due to timely operations and reduced seed rate and manual labour usage. The arecanut dehusking machine also increased the efficiency of dehusking marginally as compared to convention dehusking.

**Table: 65 Frontline demonstrations on farm implements conducted in the state of Kerala**

Implement/ Equipment demonstrated	No. of farmers	Area (ha)	No. of labours saved/ha	Yield - (q/ha)		% increase over check	Net returns (Rs/ha)		Name of technology specific parameter	Demo Plot	Check Plot
				Demo	Check		Demo	Check			
Rotavator, Transplanter, Drum seeder, Cono weeder in paddy at Kasaragod	2	1	66	48	44.5	7.87	38300	22200	Seed requirement (kg/ha)	45	75
Four row walk behind transplanter in paddy at Wynad	10	2	23	5250	4125	27.27	45000	9500	-	-	-
Arecanut dehusker at Malappuram	10	-	-	-	-	-	-	-	Nuts dehusked (kg/hr)	4.9	4.1
<b>State Total</b>	<b>22</b>	<b>3</b>									

**Livestock and fisheries:** During the year, 1357 demonstrations on livestock, sheep & goat, piggery, poultry and fisheries have been conducted by the KVKs of Karnataka, Tamil Nadu, Kerala and Goa states under Zone-VIII. The State-wise details of technologies demonstrated and their performance are presented below:

**Karnataka:** Out of 351 demonstrations, 244 on dairy cow covering 349 animals, 64 on sheep and goat covering 104 animals, 10 on piggery, 10 on

poultry covering 354 birds and 23 on fisheries were conducted by KVKs of Karnataka. The technologies demonstrated include quality fodder feeding, feeding pro-biotics, mineral mixture, feeding rumen bypass fat, management of foot-rot/soft hoof in dairy animals, integrated dairy calf management, infertility management and introduction of new breeds in sheep, goat and poultry. The details of technology/breed/species demonstrated with economic returns are presented in Table 66.

**Table: 66 Details of technology/breed/species demonstrated under FLDs with economic returns in Karnataka.**

KVK	Technology demonstrated	Name of Breed/Species	No. of farmers	No. of livestock per farmer	Unit of Yield	Yield		% increase over check	Net returns Rs/livestock/year		B:C ratio	
						Demo	Check		Demo	Check	Demo	Check
<b>Dairy</b>												
Koppal	Fodder cafeteria in dairy farming	Local Buffalo	5	85	Milk yield in litres/animal/lactation	1870	1672	11.84	52360	46816	2.38	2.12
Kalaburagi	Area Specific Mineral Mixture in dairy cross bred cows	HF Cow	10	10	Milk yield in litres/animal/lactation	29744	25916	14.77	89540	48620	4.06	2.67
Kalaburagi	Supplementation of slow releasing urea on milk yield	HF cows	4	4	Milk yield litres/animal/lactation	1852	1529	21.15	80410	47410	3.61	2.63
Kalaburagi	Feeding of probiotics on milk yield and its quality in dairy animals	Local Buffalo	20	20	Milk yield in litres/animal/lactation	1333	1172	13.70	37324	32816	1.69	1.49
Kalaburagi	Effect of feeding SRU and ASMM on milk yield & its composition in dairy animals	Local Buffalo Cross bred	30	30	Milk yield in litres/animal/lactation	1672	1386	20.63	28050	21800	1.27	0.91
Kalaburagi	Azolla feeding for cow	Cross bred	10	10	Milk yield in litres/animal/lactation	1595	1430	11.54	10980	8920	1.34	1.28
Davanagere	Balanced nutrition in dairy animals	HFx Cow	10	10	Milk yield in litres/animal/lactation	837			5668		1.39	
Davanagere	Chelated mineral mixture on milk yield	Cross breed	10	10	Milk yield in litres/animal/lactation	2332	2156	8.16	52672	44588	3.94	3.78
Bellary	Feeding of rumen bypass fat to improve milk yield	Cross breed	10	10	Milk yield in litres/animal/lactation	3588	3187	12.56	95933	71720	5.90	5.47
Shimoga	Feeding by pass fat to lactating cross bred cows	Jersey and HF	7	7	Milk yield in litres/animal/lactation	880	550	60.00	37224	10600	1.35	1.11
Gadag	Effect of feeding green fodder as per recommendation	Cross bred cow	8	8	Milk yield in litres/animal/lactation	1540	1155	33.33	19409	4913	1.95	1.18
Bangalore Rural	Introduction of fodder grass CO-3 for increased milk yield	HF	10	20	Milk yield in litres/animal/lactation	3354	2838	18.18	50350	18950	1.41	1.20
Kalaburagi	Management of foot-rot/soft hoof in dairy animals	Cross bred	30	30	Milk yield in litres/animal/lactation	2411	1839	31.10	2821	1822	1.41	1.31
Haveri	Supplementation of Pro biotics in dairy animals	Cross bred	10	10	Milk yield in litres/animal/lactation	2090	1650	26.67	778	350	1.52	1.24
Haveri	Supplementation of slow releasing urea as a source of protein to augment milk production	Cross breed	10	10	Milk yield in litres/animal/lactation	3258	2728	19.44	77667	60380	4.89	4.76
Raichur	Demonstration of urea treatment of hay	Cross bread	10	20	Milk yield in litres/animal/lactation	20394	18744	8.80	10411	7011	1.97	1.82
Kodagu	Demonstration of enriching and ensiling of sugarcane tops for higher milk yield in cows	Dairy cows	5	10	Milk yield in litres/animal/lactation	2640	2200	20.00	25400	20950	2.68	2.47

*(Contd...)*



KVK	Technology demonstrated	Name of Breed/Species	No. of farmers	No. of livestock per farmer	Unit of Yield	Yield		% increase over check	Net returns Rs/livestock/year		B:C ratio	
						Demo	Check		Demo	Check	Demo	Check
Bengaluru Rural	Integrated dairy calf management	HF cross	30	30	kg/animal	220	180	22.22	15912	6207	2.13	1.45
Bengaluru Rural	Infertility management in cross bred dairy animals	HF cross	15	15	% conception rate	87	27	68.96	12500	3200	1.38	1.10
			<b>244</b>	<b>349</b>								
<b>Piggery</b>												
Hassan	Effective treatment for Foot Rot/Soft Hoof problem in Pigs	Duroc/ Yorkshire	5	5	kg/animal	78	64.32	21.27	46000	28940	1.51	1.35
Kodagu	Introduction of effective acaricide against saroptic management in pigs	Duroc and Yorkshire	5	5	kg/animal	82.46	62.24	32.49	209750	131350	2.13	1.79
			<b>10</b>	<b>10</b>								
<b>Sheep and Goat</b>												
Hassan	Balanced feeding and total deworming in small ruminants for better performance	Local	5	10	kg/animal	70.64	40.05	76.38	11565	5025	2.90	1.99
Koppal	Management of parasitic infestation in sheep	Kenguri	10	50	kg/animal	3.7	2.1	76.19	294	0	15.00	0
Koppal	Up gradation of Kenguri sheep with Rambouillet rams	Kenguri	1	1	kg/animal	4.1	3.2	28.13	610	430	3.90	3.05
Raichur	Introduction of effective treatment for foot rot in sheep & goat	Kenguri	12	4	kg/animal	76.3	36.4	109.62	200	0	1.67	
Raichur	Introduction of effective treatment for foot rot / soft hoof in sheep & goats	Local breeds	12	12	% of recovery	84.33	26.25		0	0		
Raichur	Up gradation of local goat breeds with Sirrohi buck	Local breeds	3	3	kg/animal	3.5	2.5	40.00	0	0		
Chikkamagalur	Nutritional intervention with urea molasses mineral block in goats	Local breed	20	20	kg/animal	11	9	22.22	31000	22000	1.89	1.69
Dharwad	Popularization of Sirohi breed through stall feeding	Sirohi	1	4	kg/animal	41	32.75	25.19		0		
			<b>64</b>	<b>104</b>								
<b>Poultry</b>												
Hassan	Demonstration of Swarnadhara bird in backyard poultry	Swarnadhara	5	102	kg/bird	1.15	0.65	76.92	0	0		
Hassan	Oral Pellet Vaccine against Ranikhet disease in backyard poultry	Backyard poultry	5	250	kg/bird	1.5	1.5	0.00	15440	8500	2.19	1.68
			<b>10</b>	<b>352</b>								
<b>Fishery</b>												
Haveri	Amur Common carp for higher productivity	Amur common carp	2	1900	kg of fish	5432	4525	20.05	280624	185199	4.87	3.15
Haveri	Carp farming in alkaline, saline and water logged areas	Common carp	5	7600	kg of fish	4525	0		185199	0	3.15	

(Contd...)



KVK	Technology demonstrated	Name of Breed/Species	No. of farmers	No. of livestock per farmer	Unit of Yield	Yield		% increase over check	Net returns (Rs/livestock/year)		B:C ratio	
						Demo	Check		Demo	Check	Demo	Check
Haveri	Composite fish culture in farm pond	Rohu, commo, carp, Grass carp	5	2	kg of fish	825	640	28.91	37800	49300	3.82	3.95
Haveri	Polyculture of fishes in big earthen ponds	Pangassius, Catla labeo rohita	6	1	kg of fish	13125			396667	0	2.31	
Belagavi	Stunted fingerling for higher productivity	Catla and Common carp	5	5800	kg of fish	7573	4893	54.77	448268	281108	11.19	8.61
			<b>23</b>									
<b>State Total</b>			<b>351</b>									

**Goa:** A total of 20 demonstrations were conducted by KVKs of Goa State on composite fresh water carp in fisheries and probiotics on milk yield and its quality in cross breed dairy cows. The details of performance of these demonstrations are presented in Table 67. The

demonstration on composite fresh water carp culture gave substantially higher yield with BCR of 2.49 as compared to check. In dairy, demonstration of probiotics in cows led to 18.67% increased milk yield as compared to check.

**Table:67 Details of technology/breed/species demonstrated under FLDs with economic returns in the state of Goa**

KVK	Technology demonstrated	Name of Breed/Species	No. of farmers	No. of livestock per farmer	Unit of Yield	Yield		% increase over check	Net returns (Rs/livestock/year)		B:C ratio	
						Demo	Check		Demo	Check	Demo	Check
<b>Fishery</b>												
South Goa	Composite fresh water carp culture	Indian major carps	10	10000	kg of fish	3150	275	1045	373725	12750	2.49	1.26
<b>Dairy</b>												
South Goa	Pro-biotics on milk yield & its quality in cross bred dairy cows	Cross bred cow	10	10	Milk yield in litres/animal/lactation	1837	1548	18.67	60940	32120	3.05	2.10
<b>State Total</b>			<b>20</b>									

**Tamil Nadu:** Out of total 778 demonstrations, 650 on dairy cow covering 673 animals, 20 on sheep and goat covering 70 animals, 10 on piggery covering 210 animals, 83 on poultry covering 1880 birds and 13 on fisheries were conducted by KVKs of Tamil Nadu (Table 68). Technologies

demonstrated include introduction of high yielding breeds/species and nutritional mixture. The details of technology/breed/species demonstrated with net returns/demo and BCR are presented in Table 68.



**Table: 68 Details of technology/breed/species demonstrated under FLDs with economic returns in Tamil Nadu**

KVK	Technology demonstrated	Name of Breed/Species	No. of farmers	No. of livestock per farmer	Unit of Yield	Yield		% increase over check	Net returns Rs/livestock/year		B:C ratio	
						Demo	Check		Demo	Check	Demo	Check
<b>Dairy</b>												
Karur	Improved management practices for low yielding dairy cows	Local	30	30	Milk yield in litres/animal/lactation	1700	1467	15.89	11029	1.46	5544	1.23
Karur	Demonstration on ethno veterinary herbal medicine for treatment of FMD	Jersey	200	200	Milk yield in litres/animal/lactation	3107	2925	5.86	24620	1.39	22050	1.37
Thiruvannamalai	Demonstration on low cost supplement package in dairy cows	Local	30	3	Milk yield in litres/animal/lactation	686	580	18.18	51700	3.94	9900	3.25
Shivagangai	Management practices to augment milk production in low yielding crossbred cows	Jersey	50	50	Milk yield in litres/animal/lactation	2862	2646	7.55	32440	1.61	26460	1.50
Shivagangai	Urea treated maize stover as enriched dry fodder for cross breed dairy cows	Cross bred	10	10	Milk yield in litres/animal/lactation	2042	1968	3.76	34897	2.57	28989	2.12
Tuticorin	Management of post partum anoestrus using Ovosynchronization protocol supplemented with area specific mineral mixture	Cross bred	5	10	Milk yield in litres/animal/lactation	3512	1834	91.44	70029	2.62	28957	2.06
Salem	Paddy Straw Block	Cross bred	10	10	Milk yield in litres/animal/lactation	2475	2200	12.50	37675	2.56	19800	1.69
Coimbatore	Demonstrating grand supplement	Local	10	10	Milk yield in litres/animal/lactation	380	336	13.18	3902	1.58	2751	1.41
Perambalur	Demonstration of grand supplement	Cross bred	10	20	Milk yield in litres/animal/lactation	1836	1705	7.68	32515	2.72	26193	2.22
Dindigul	GRAND Supplement	Jersey	30	30	Milk yield in litres/animal/lactation	1732	1596	8.55	8663	1.33	4788	1.18
Tuticorin	GRAND supplement	Cross bred	30	30	Milk yield in litres/animal/lactation	1795	1692	5.74	15462	1.44	13385	1.39
Nagapattinam	TANUVAS GRAND supplement (Liquid formulation)	Cross bred	100	100	Milk yield in litres/animal/lactation	320	990	25.00	34125	3.35	16275	2.63
Krishnagiri	Supplemental feeding for dairy cows	HF	20	20	Milk yield in litres/animal/lactation	2565	2259	13.53	32340	2.48	23540	1.97
Erode	TANUVAS GRAND Supplement	Cross bred	30	30	Milk yield in litres/animal/lactation	2024	1887	7.25	26074	2.06	20942	1.86
Kanyakumari	Demonstration of GRAND supplement for low	Cross bred	5	10	Milk yield in litres/animal/lactation	1319	1178	12.00	24443	3.86	23270	4.77

(Contd...)



KVK	Technology demonstrated	Name of Breed/Species	No. of farmers	No. of livestock per farmer	Unit of Yield	Yield		% increase over check	Net returns Rs/livestock/year		B:C ratio	
						Demo	Check		Demo	Check	Demo	Check
	milk yielding cow											
Dharmapuri	By-pass fat feed Supplementation	HF Cross & Jersey	20	20	Milk yield in litres/animal/lactation	2507	1851	16.67	27000	1.63	12240	1.31
Pudukottai	Demonstration of area specific mineral mixture	Cross bred	30	60	Milk yield in litres/animal/lactation	1488	1230	20.98	23129	2.30	9623	1.70
Shivagangai	Management of repeat breeding syndrome in cross breed cows	Jersey	30	30	Conception rate (%)	80	42	90.48	33100	1.54	12200	1.25
			<b>650</b>	<b>673</b>								
<b>Sheep and Goat</b>												
Thiruvallur	Demonstration on estrus synchronisation techniques to augment fertility in goats	Non Descriptive	10	50	Fertility rate (%)	82	62	32.26	2050	2.32	1200	1.80
Nilgiris	Demonstration on herbal remedies in treating enteritis in sheep and goats	Non Descriptive	10	20	Morbidity %	7	30	-76.67	52497	2.10	33913	1.82
			<b>20</b>	<b>70</b>								
<b>Piggery</b>												
Kanyakumari	Controlling of swine fever disease through vaccination	Pigs	5	200	Morbidity %	5	13					
Kancheepuram	Demonstration of low fat three way cross bred pigs	3 way X piglets	5	10	Litter size	1.78	2.66	-33.08	2000	2.04	1046	1.58
			<b>10</b>	<b>210</b>								
<b>Poultry</b>												
Kancheepuram	Demonstration of Nandhanam-IV chick production through hatching	Nandhanam-IV	2	100	Number of eggs	73.5	54	36.11	610	1.41	135	1.10
Kancheepuram	Nutritional security and income generation through backyard poultry	Country chicks	8	80	kg/bird	0.34	0.3	13.33	1020	4.28	212	3.39
Kancheepuram	Demonstration on oral pellet vaccination in desi birds for preventing ranikhet disease	Desi chicken	10	500	Numbers	3.8	27.34	-86.10	7140	1.95	3510	1.47
Kancheepuram	Demonstration on oral pellet vaccine against Ranikhet disease in desi birds	Country chick	50	1000	kg/bird	1.2	0.92	30.43	3183	3.13	2112	2.58
Kancheepuram	Orel pellet vaccine in backyard poultry	Country chick	10	100	kg/bird	6.53	0.283	2207.42	1019	1.94	526	1.86
Namakkal	Surveillance, Vaccination and Serum monitoring for Ranikhet disease	Desi birds	5	100	Numbers	85	40	112.50	6125	12.67	900	2.80
			<b>85</b>	<b>1880</b>								
<b>Fishery</b>												
Erode	Catfish culture	Pangasio nodon hypothalamus	3	800	kg of fish	444	984	-54.88	46503	2.13	23575	1.78

(Contd...)



KVK	Technology demonstrated	Name of Breed/Species	No. of farmers	No. of livestock per farmer	Unit of Yield	Yield		% increase over check	Net returns Rs/livestock/year		B:C ratio	
						Demo	Check		Demo	Check	Demo	Check
Erode	Composite fish culturing with stunted fingerlings	Catla,Rohu, Mrigal, Channa spp.	3	3000	kg of fish	1571	984	59.65	150625	2.77	23575	1.78
Erode	Murrel culture	Channa spp.	2	500	kg of fish	1599	984	62.50	357836	3.93	23575	1.78
Tiruvarur	Rearing of Fingerlings in hapas	Composite fish culture	5	100000 hatchlings	kg of fish	6330	1900	233.16	20200	2.32	3640	1.36
State Total			13	778								

**Kerala:** Out of total 208 demonstrations, 180 were on dairy cow covering 215 animals, 5 on piggery covering 10 animals, 15 on poultry covering 140 birds and 8 on fisheries were conducted by KVKs of Kerala. The technologies demonstrated include OVO synchronization for

infertility management in buffalo, use of GRAND supplements, feeding management, introduction of high yielding breeds/species and disease management. The details of technology/breed/species demonstrated with economic returns are presented in Table 69.

**Table: 69 Details of technology/breed/species demonstrated under FLDs with economic returns in Kerala**

KVK	Technology demonstrated	Name of Breed/Species	No. of farmers	No. of livestock per farmer	Unit of Yield	Yield		% increase over check	Net returns Rs/livestock/year		B:C ratio	
						Demo	Check		Demo	Check	Demo	Check
<b>Dairy</b>												
Malappuram	OVO Synchronization for infertility in buffaloes	Buffaloes	10	10	Milk yield in litres/animal/lactation	1100	770	42.86	31500	2602	3.33	1.26
Pathanamthitta	Use of medicated urea molasses multi nutrient block	Cross bred	10	10	Milk yield in litres/animal/lactation	233.56	216	8.13	4803	4401	1.93	1.91
Pathanamthitta	GRAND supplement in cross bred cows	Jersey Cross	10	10	Milk yield in litres/animal/lactation	1400	1300	7.69	13200	8980	1.91	1.66
Kozhikode	Complete feed mixture (3 parts roughages and 1 part concentrates) in dairy cattle	Cross bred	20	20	Milk yield in litres/animal/lactation	2420	1760	37.50	69300	38500	2.80	2.67
Kozhikode	Feeding Anionic mixture (30-50 g per animal per day) to prevent milk fever in dairy cattle	Cross bred	25	25	Milk yield in litres/animal/lactation	2310	1650	40.00	84700	29260	2.83	2.02
Alleppey	Feeding lactating cows with TMR + Green Fodder	Cross bred	5	5	Milk yield in litres/animal/lactation	2520	2520	0.00	15802	9524	1.23	1.13
Alleppey	Feeding of Dairy animals with fodder cowpea	Cross bred	10	10	Milk yield in litres/animal/lactation	2584	2569	0.58	12987	9280	1.18	1.12
Kottayam	Pineapple fruit silage as livestock feed		5	5	Milk yield in litres/animal/lactation	1650	1980	-16.67	54560	39600	3.21	2.50

(Contd...)



KVK	Technology demonstrated	Name of Breed/Species	No. of farmers	No. of livestock per farmer	Unit of Yield	Yield		% increase over check	Net returns Rs/livestock/year		B:C ratio	
						Demo	Check		Demo	Check	Demo	Check
Idukki	Mixed fodder for milking cows	Dairy cows	10	10	Milk yield in litres/animal/lactation	3080	2860	7.69	16810	9340	2.24	1.64
Idukki	Prophylactic management of mastitis in dairy cows by using antiseptic solution in teat cups	Jersey and HF	10	10	Milk yield in litres/animal/lactation	3080	2640	16.67	9320	6260	1.63	1.44
Idukki	Teat dipping with povidone iodine to control Mastitis	Cross bred	30	30	Milk yield in litres/animal/lactation	1301	936	39.00	57269	45507	1.94	1.79
Trivandrum	Use of anionic diet (DCAB) for prevention of Hypocalcemia	Cross bred	20	40	Milk yield in litres/animal/lactation	2860	2640	8.33	36500	32500	1.37	1.33
Trivandrum	Use of area specific mineral mixture	Cross bred	15	30	Milk yield in litres/animal/lactation	2860	2640	8.33	38000	32500	1.38	1.33
			180	215								
<b>Piggery</b>												
Kasaragod	Popularisation of commercial probiotics in goat kids	Malabari	5	10	kg/animal	11.99	9.3	28.92	1700	600	1.55	1.20
			5	10								
<b>Poultry</b>												
Kasaragod	Fish silage feeding in homestead poultry		10	100	Number of eggs	195	191	2.09	290	221	1.25	1.18
Kollam	Poultry rearing in urban area	Gramasree	5	40	Number of eggs	172						
			15	140								
<b>Fishery</b>												
Trivandrum	Culture of indigenous fish (channa striatus) viral in fresh water systems associated with paddy	Channa striatus	3	3 ha	kg of fish	0.17			-8556		0.05	
Kasaragod	Fresh water pearl culture		5	5 units	Numbers	125			5000	500	6.00	2.00
			8									
<b>State Total</b>			<b>208</b>									

**Other enterprises:** A total of 791 demonstrations were organized on other enterprises such as drudgery reduction for farm women, resource conservation technologies like vermicomposting, nutri-composting, use of bio-degradable waste etc., processing and value addition in paddy, jack, maize, sorghum, ragi, banana, tamarind, navane, Integrated Farming Systems, production and management of mushroom, sericulture, apiary for income generation mainly for farm women by the KVKs through establishment of SHGs and production units during the year (Table 70). In Karnataka, 423 demonstrations on silk worm rearing, value

addition in millets, apiary, nutrition gardening etc. through establishment of 70 units and 15 SHGs were undertaken. A total of 306 demonstrations were conducted in the areas of Integrated Farming Systems, mushroom, value addition in crops through branding and marketing by the KVKs of Kerala state through establishment of 59 units and 30 SHGs. In Tamil Nadu, KVKs have organized 65 demonstrations on enterprises such as value addition in minor millets, turmeric, banana, Integrated Farming System and mushroom enterprises through 17 units and 4 SHGs during the year.

**Table: 70 FLDs on Enterprises conducted by the KVKs of Zone-VIII**

State	Thematic Area	Title of Demonstration	Enterprise	Unit Size	No. of units	No. of demonstrations
Mandya	Drudgery Reduction	Demonstration of groundnut decorticator to farm women	Drudgery reduction	1 SHG	4	4
Chikkaballapura	Resource Conservation Technology	Demonstration of nutri-compost making for farm women	Nutri-compost	1 unit	1	20
Gadag	Resource Conservation Technology	Vermicomposting technologies for farm women	Vermicompost	1 SHG	5	5
Mandya	Resource Conservation Technology	Recycling of bio-degradable waste by farm women	Compost	1 SHG	12	12
Kolar	Integrated Farming System	IFS for farm women	IFS	4 units	8	22
Mandya	Processing and Value Addition	Value addition in paddy	Paddy	1 SHG	1	15
Mandya	Processing and Value Addition	Value addition in Jack	Jack	1 SHG	1	15
Mandya	Processing and Value Addition	Value addition in maize	Maize	2 SHG	2	40
Chitradurga	Processing and Value Addition	Value addition in ragi	Ragi	4 SHG	4	54
Chitradurga	Processing and Value Addition	Value addition in tamarind	Tamarind	2 SHG	2	25
Dharwad	Processing and Value Addition	Value addition in navane	Navane	1 SHG	1	5
Dharwad	Processing and Value Addition	Value addition in sorghum	Sorghum	1 SHG	1	10
Chamarajanagar	Processing and Value Addition	Value addition groundnut	Groundnut	1 unit	1	25
Chamarajanagar	Production and Management	Sericulture enterprise for augmenting farm income	Sericulture	12	16	127
Chikkaballapura	Small Scale Income Generating Enterprises	Apiary enterprise for augmenting farm income	Apiary	0.8 ha	1	25
Bengaluru Rural	Small Scale Income Generating Enterprises	Nutrition Gardening in terraces by farm women	Nutrition Garden	4 units	4	4
Bengaluru Rural	Small Scale Income Generating Enterprises	Nutrition Gardening for school children	Nutrition Garden	1 School	1	10
Koppal	Small Scale Income Generating Enterprises	Nutrition Gardening by farm women	Nutrition Garden	2	5	5
<b>State Total</b>					<b>70</b>	<b>423</b>
Alleppey	Processing and Value Addition	Oriental pickling melon making by farm women	Pickling melon	1 SHG	1	5
Alleppey	Processing and Value Addition	Processing and Value addition of Karthika variety ginger	Ginger	1 SHG	1	5
Kannur	Processing and Value Addition	Value addition in coconut by production of Virgin Coconut Oil (VCO)	Coconut	1 SHG	1	5
Kozhikode	Processing and Value Addition	Value addition in fruits	Fruits	1 SHG	1	10

*(Contd...)*



**Table: 70 FLDs on Enterprises conducted by the KVKs of Zone-VIII**

State	Thematic Area	Title of Demonstration	Enterprise	Unit Size	No. of units	No. of demonstrations
Palghat	Processing and Value Addition	Value addition in ragi	Ragi	1 SHG	1	1
Thrissur	Processing and Value Addition	Value addition in vegetables	Vegetables	3 SHG	3	60
Trivandrum	Processing and Value Addition	Value addition in tuber crops	tubercrops	1 SHG	5	30
Kannur	Production and Management	Mushroom enterprise for augmenting farm women income	Mushroom	10 units	28	120
Palghat	Small Scale Income Generating Enterprises	Nutrition Gardening by farm women	Nutrition Garden	6 SHG	13	24
Kasaragod	Small Scale Income Generating Enterprises	Tailoring for augmenting income to rural women	Tailoring	3 SHG	3	31
Kottayam	Resource Conservation Technology	Vermicomposting technologies for farm women	Vermicompost	1 SHG	1	10
Kasaragod	Production and Management	Apiary enterprise for augmenting farm income	Apiary	1 SHG	1	5
<b>State Total</b>					<b>59</b>	<b>306</b>
Kancheepuram	Processing and Value Addition	Value addition in minor millets	Minor millets	1 SHG	1	10
Coimbatore	Processing and Value Addition	Value addition in turmeric	Turmeric	1 SHG	1	10
Coimbatore	Processing and Value Addition	Value addition in banana	Banana	2 SHG	2	30
Thiruvallur	Integrated Farming System	IFS for farm women	Integrated Farming system	1 unit	3	5
Erode	Production and Management	Mushroom enterprise for augmenting farm women income	Mushroom	4 m2	10	10
<b>State Total</b>					<b>17</b>	<b>65</b>
<b>Zone Total</b>					<b>146</b>	<b>794</b>

### 3.1.3 Capacity development

During the year under report, 5471 training courses were organized in which 202619 persons belonging to different categories participated. Majority of these (4127 courses) were for farmers/farm women category in which 154663 farmers/farm women were trained. More than

five hundred training courses were organized for rural youth category involving 18680 participants. State-wise break-up indicates that more number of training courses were organized in Tamil Nadu, followed by Karnataka. Details are given in Table 71.

**Table 71. State-wise and category-wise number of training courses organized and the number of participants**

State / UT	Farmers / Farm Women		Rural Youth		Extension Functionary		Sponsored Programmes		Vocational Programmes		Total	
	C	P	C	P	C	P	C	P	C	P	C	P
Goa	97	2490	22	579	7	155	0	0	0	0	126	3224
Karnataka	1480	60483	94	3835	141	4927	52	2059	27	869	1794	72173
Kerala	821	30570	248	7509	79	2519	126	5816	68	2331	1342	48745
Puducherry	25	641	6	177	7	176	2	32	0	0	40	1026
TamilNadu	1704	60479	182	6580	99	3478	148	5559	36	1355	2169	77451
<b>Total</b>	<b>4127</b>	<b>154663</b>	<b>552</b>	<b>18680</b>	<b>333</b>	<b>11255</b>	<b>328</b>	<b>13466</b>	<b>131</b>	<b>4555</b>	<b>5471</b>	<b>202619</b>

C= No. of Courses P= No. of Participants

The data in Fig 2 reveals that more than 82 % of the programmes were organized for farmers. The data depicted in Fig 3 denotes the extent of participation of the three categories of participants.

Fig 2. Percentage of courses organised for different categories of participants

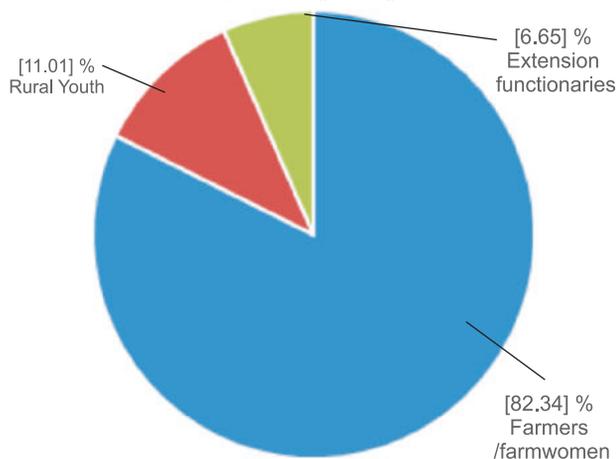
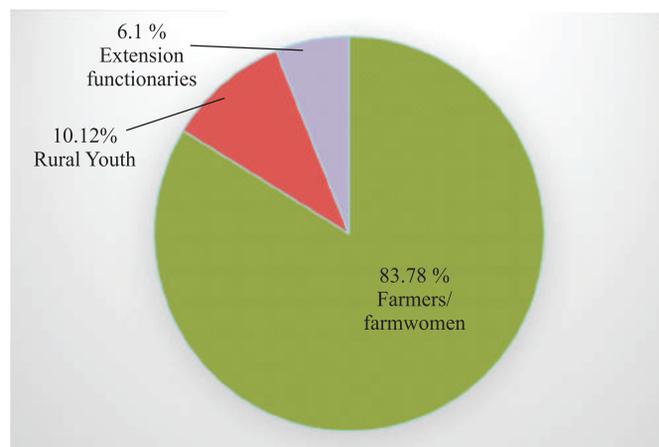


Fig 3. Percentage of different categories of participants





**Off campus training on coconut tonic for drought Management**

**1.Farmers and Farmwomen:** Training organized for farmers/farm women category covered different training areas listed in Table 72. The major training area was crop production numbering 1101 courses in which 42026 farmers/farm women participated. Training on plant protection (688 courses) and home science (563 courses) were also conducted in large number. Livestock production and management

was the next important training area with 477 courses for 19327 farmers followed by soil health and fertility management (340 courses and 12666 participants). In horticulture crops, vegetable crop cultivation with 286 courses was the leading training area. Women participants outnumbered men only in home science/women empowerment training courses.



**On campus training on virgin coconut oil extraction**



**Training on Power weeder at Thiruvannamalai**



**Table 72. Training courses organized for farmers and farmwomen**

Training Area	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Crop production	1101	28614	6780	35394	4873	1759	6632	33487	8539	42026
Vegetable crops	286	7132	2338	9470	1065	495	1560	8197	2833	11030
Fruits	110	2218	779	2997	406	188	594	2624	967	3591
Ornamental plants	22	721	257	978	79	58	137	800	315	1115
Plantation crops	79	1610	670	2280	365	198	563	1975	868	2843
Tuber crops	12	213	30	243	49	0	49	262	30	292
Spices	50	1837	377	2214	187	48	235	2024	425	2449
Medicinal and aromatic plants	16	500	141	641	59	12	71	559	153	712
Soil health and fertility management	340	8395	2378	10773	1340	553	1893	9735	2931	12666
Livestock production and management	477	9215	5275	14490	2005	2832	4837	11220	8107	19327
Home Science/women empowerment	563	4284	11700	15984	1062	2669	3731	5346	14369	19715
Agricultural engineering	123	2283	751	3034	394	142	536	2677	893	3570
Plant protection	688	17325	4696	22021	3078	1230	4308	20403	5926	26329
Fisheries	38	657	304	961	67	21	88	724	325	1049
Production of input at site	77	1441	699	2140	257	198	455	1698	897	2595
Capacity building and group dynamics	122	2525	1323	3848	369	261	630	2894	1584	4478
Agro forestry	23	569	130	699	129	48	177	698	178	876
<b>Grand Total</b>	<b>4127</b>	<b>89539</b>	<b>38628</b>	<b>128167</b>	<b>15784</b>	<b>10712</b>	<b>26496</b>	<b>105323</b>	<b>49340</b>	<b>154663</b>



The state-wise categorization of the above data reveals that out of 4127 courses, 1704 courses were organized in Tamil Nadu, 1480 courses in Karnataka and 821 courses in Kerala. Out of the total of 154663 participants, 60483 were

Karnataka farmers/farmwomen. As regards the different category of participants, 26496(17.13%) were from SC/ST category and 49340 (31.90%) were women participants. Details are given in Table 73.

**Table 73. State-wise break-up of the training programmes conducted for farmers and farmwomen**

State/UT	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Goa	97	796	811	1607	506	377	883	1302	1188	2490
Karnataka	1480	38674	10686	49360	7656	3467	11123	46330	14153	60483
Kerala	821	15293	11154	26447	2363	1760	4123	17656	12914	30570
Puducherry	25	277	204	481	54	106	160	331	310	641
Tamil Nadu	1704	34499	15773	50272	5205	5002	10207	39704	20775	60479
<b>TOTAL</b>	<b>4127</b>	<b>89539</b>	<b>38628</b>	<b>128167</b>	<b>15784</b>	<b>10712</b>	<b>26496</b>	<b>105323</b>	<b>49340</b>	<b>154663</b>

**1. Rural Youth:** Training courses organized in different training areas for rural youth (552 courses, 18680 participants) are detailed in Table 74. Among these, value addition was the major training area with 98 courses (3470 participants) followed by 65 courses on integrated farming (2246 participants). Entrepreneurship related training areas like mushroom production (61 courses, 2176 participants) and nursery

management of horticulture crops (48 courses, 1508 participants) were also the important training areas for rural youth. It encouraging to note that training on protected cultivation of vegetable crops, vermi-culture, value addition, post harvest technology, small scale processing and rural crafts courses attracted more number of women participants than men.

**Table 74. Training courses organized for rural youth**

Training Area	No. of Courses	General participants			SC/ST participants			Total participants		
		M	F	T	M	F	T	M	F	T
Nursery management of horticulture crops	48	678	586	1264	188	56	244	866	642	1508
Training and pruning of orchards	2	26	12	38	2	0	2	28	12	40
Protected cultivation of vegetable crops	15	261	304	565	41	21	62	302	325	627
Commercial fruit production	4	103	55	158	17	12	29	120	67	187
Integrated farming	65	1330	613	1943	227	76	303	1557	689	2246
Seed production	3	33	21	54	4	4	8	37	25	62
Production of organic inputs	23	256	285	541	73	46	119	329	331	660
Planting material production	24	273	206	479	32	6	38	305	212	517
Vermiculture	8	56	171	227	9	4	13	65	175	240

(Contd...)



Training Area	No. of Courses	General participants			SC/ST participants			Total participants		
		M	F	T	M	F	T	M	F	T
Mushroom production	61	1012	980	1992	96	88	184	1108	1068	2176
Beekeeping	28	830	203	1033	130	34	164	960	237	1197
Sericulture	12	307	67	374	57	15	72	364	82	446
Repair and maintenance of farm machinery and implements	17	145	62	207	48	15	63	193	77	270
Value addition	98	1024	2000	3024	160	286	446	1184	2286	3470
Small scale processing	22	316	474	790	42	54	96	358	528	886
Post harvest technology	23	347	478	825	19	26	45	366	504	870
Tailoring and Stitching	4	0	54	54	0	2	2	0	56	56
Rural crafts	23	19	298	317	13	371	384	32	669	701
Production of quality animal products	20	456	156	612	35	17	52	491	173	664
Dairying	24	565	130	695	275	60	335	840	190	1030
Sheep and goat rearing	10	101	67	168	27	16	43	128	83	211
Piggery	1	4	1	5	2	10	12	6	11	17
Rabbit farming	2	22	0	22	0	0	0	22	0	22
Poultry production	8	166	140	306	41	35	76	207	175	382
Ornamental fisheries	2	33	19	52	4	0	4	37	19	56
Composite fish culture	3	28	45	73	3	1	4	31	46	77
Fish harvest and processing technology	1	48	4	52	0	0	0	48	4	52
Fry and fingerling rearing	1	2	5	7	1	2	3	3	7	10
<b>Total</b>	<b>552</b>	<b>8441</b>	<b>7436</b>	<b>15877</b>	<b>1546</b>	<b>1257</b>	<b>2803</b>	<b>9987</b>	<b>8693</b>	<b>18680</b>

Training courses related to rural youth have been further categorized under different states as given in Table 75. KVKs of Kerala conducted more number of courses for rural youth (248 courses)

than Tamil Nadu (182 courses) and Karnataka (94 courses). Further, it may be noted that more than 46.5 % (8693 out of 18680) of the participants were women.

**Table 75. State/Union Territory wise break-up of the training programmes conducted for rural youth**

State/UT	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Goa	22	230	286	516	46	17	63	276	303	579
Karnataka	94	2083	771	2854	745	236	981	2828	1007	3835
Kerala	248	3054	3238	6292	488	729	1217	3542	3967	7509
Puducherry	6	66	87	153	7	17	24	73	104	177
Tamil Nadu	182	3008	3054	6062	260	258	518	3268	3312	6580
<b>TOTAL</b>	<b>552</b>	<b>8441</b>	<b>7436</b>	<b>15877</b>	<b>1546</b>	<b>1257</b>	<b>2803</b>	<b>9987</b>	<b>8693</b>	<b>18680</b>

**3. Extension Functionaries:** A total of 333 courses were organized for 11255 extension functionaries. Among the different training areas, productivity enhancement in field crops was the

major area with 96 courses and 3200 participants. Integrated pest management was the next major training area with 46 courses and 1287



participants. Details of number of courses organized in different training areas along with the number of participants categorized under

general, SC/ST, men and women for each of the training areas are given in Table 76:

**Table 76. Training courses organized for extension functionaries**

Training Area	No. of Courses	General participants			SC/ST participants			Total participants		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Productivity enhancement in field crops	96	2404	550	2954	190	56	246	2594	606	3200
Integrated pest management	46	960	236	1196	78	13	91	1038	249	1287
Integrated nutrient management	24	517	153	670	92	23	115	609	176	785
Rejuvenation of old orchards	1	8	0	8	4	0	4	12	0	12
Protected cultivation technology	31	813	221	1034	92	40	132	905	261	1166
Production and use of organic inputs	13	189	121	310	23	18	41	212	139	351
Care and maintenance of farm machinery and implements	3	62	6	68	0	0	0	62	6	68
Gender main-streaming through SHGs	2	8	17	25	1	6	7	9	23	32
Formation and Management of SHGs	4	23	100	123	0	6	6	23	106	129
Women and child care	26	9	761	770	48	173	221	57	934	991
Low cost and nutrient efficient diet designing	6	0	184	184	0	42	42	0	226	226
Group dynamics and farmers organization	22	526	205	731	33	43	76	559	248	807
Information networking among farmers	5	91	55	146	10	4	14	101	59	160
Capacity building for ICT application	11	264	53	317	19	4	23	283	57	340
Management in farm animals	9	232	22	254	13	0	13	245	22	267
Livestock feed and fodder production	19	579	179	758	93	27	120	672	206	878
Household food security	15	121	324	445	6	105	111	127	429	556
<b>Total</b>	<b>333</b>	<b>6806</b>	<b>3187</b>	<b>9993</b>	<b>702</b>	<b>560</b>	<b>1262</b>	<b>7508</b>	<b>3747</b>	<b>11255</b>

Details of training courses organized for extension functionaries have also been elaborated state-wise as given in Table 77. KVKs in Karnataka organized 141 courses with the

participation of 4927 extension functionaries. In Tamil Nadu, 99 courses were organized for 3478 extension functionaries, whereas in Kerala 79 courses were organized for 2519 participants.



**Table 77. State -wise break-up of the training courses conducted for extension functionaries**

State/UT	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Goa	7	37	93	130	14	11	25	51	104	155
Karnataka	141	3099	1049	4148	478	301	779	3577	1350	4927
Kerala	79	1172	1173	2345	52	122	174	1224	1295	2519
Puducherry	7	89	75	164	0	12	12	89	87	176
Tamil Nadu	99	2409	797	3206	158	114	272	2567	911	3478
<b>Total</b>	<b>333</b>	<b>6806</b>	<b>3187</b>	<b>9993</b>	<b>702</b>	<b>560</b>	<b>1262</b>	<b>7508</b>	<b>3747</b>	<b>11255</b>

**4. Sponsored Programmes:** Besides the regular training courses, 328 sponsored ones were conducted by the KVKs in different areas for the benefit of 13466 participants (Table 78). Largest number of training courses (169) were organized on increasing production and productivity of crops with the participation of 6291 farmers/rural youth/extension functionaries. Soil health and fertility management was the second major area of training under sponsored

category with 38 courses and 1635 participants indicating the recognition of importance by different agencies the need of good soils. Capacity building and group dynamics was organized on 25 occasions involving 1133 extension personnel. Training on economic empowerment of women has the distinction of having highest proportion of women (829 out of 1010) participants, followed by training on household nutritional security (156 out of 167 participants).

**Table 78. Sponsored training courses organized during 2014-15**

Training Area	No. of Courses	General participants			SC/ST participants			Total participants		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Increasing production and productivity of crops	169	3909	1431	5340	697	254	951	4606	1685	6291
Commercial production of vegetables	14	386	128	514	121	25	146	507	153	660
Soil health and fertility management	38	1018	388	1406	179	50	229	1197	438	1635
Production of inputs at site	14	484	202	686	7	10	17	491	212	703
Methods of protective cultivation	14	305	176	481	32	11	43	337	187	524
Processing and value addition	3	93	40	133	1	0	1	94	40	134
Farm machinery, tools and implements	16	353	101	454	49	50	99	402	151	553
Livestock production and management	3	52	54	106	22	13	35	74	67	141
Animal nutrition management	5	179	87	266	11	10	21	190	97	287
Animal disease management	6	98	70	168	26	34	60	124	104	228
Household nutritional security	9	11	143	154	0	13	13	11	156	167
Economic empowerment of women	12	141	719	860	40	110	150	181	829	1010
Capacity Building and Group Dynamics	25	681	273	954	128	51	179	809	324	1133
<b>Grant Total</b>	<b>328</b>	<b>7710</b>	<b>3812</b>	<b>11522</b>	<b>1313</b>	<b>631</b>	<b>1944</b>	<b>9023</b>	<b>4443</b>	<b>13466</b>

State-wise break-up of sponsored programmes is provided in Table 79. A total of 148 courses were organized in Tamil Nadu, followed by 126 in Kerala and 52 in Karnataka. The data also reveals that, 1944 participants represented SC/ST category (14.4%) and 33 % (4443 out of 13446) were women. All the participants in Puducherry were women.



Sponsored training on coconut tree climbing at Trivandrum district

**Table 79. State/Union Territory-wise break-up of the sponsored programmes**

State/UT	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Karnataka	52	1508	311	1819	165	75	240	1673	386	2059
Kerala	126	2829	2282	5111	431	274	705	3260	2556	5816
Puducherry	2	0	29	29	0	3	3	0	32	32
Tamil Nadu	148	3373	1190	4563	717	279	996	4090	1469	5559
<b>TOTAL</b>	<b>328</b>	<b>7710</b>	<b>3812</b>	<b>11522</b>	<b>1313</b>	<b>631</b>	<b>1944</b>	<b>9023</b>	<b>4443</b>	<b>13466</b>

**5. Vocational Programmes:** A total of 131 training courses were organized during the year involving 4555 budding entrepreneurs. Among the different vocations, value addition was the major area of training with 31 courses and 780 participants. Integrated crop management was

another major area with 18 courses benefiting 797 participants. Value addition training programmes also attracted large number of women (616) compared to other areas. Details are provided in Table 80.

**Table 80. Vocational training courses organized during 2014-15**

Training Area	No. of Courses	General participants			SC/ST participants			Total participants		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Commercial floriculture	3	60	61	121	5	8	13	65	69	134
Commercial fruit production	1	30	13	43	3	4	7	33	17	50
Commercial vegetable production	7	166	212	378	13	11	24	179	223	402
Integrated crop management	18	424	250	674	85	38	123	509	288	797
Organic farming	6	89	108	197	11	108	119	100	216	316
Value addition	31	141	490	631	23	126	149	164	616	780

(Contd...)

Training Area	No. of Courses	General participants			SC/ST participants			Total participants		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Dairy farming	7	142	46	188	10	2	12	152	48	200
Sheep and goat rearing	1	5	4	9	2	4	6	7	8	15
Poultry farming	2	67	19	86	13	1	14	80	20	100
Vermi-composting	3	72	7	79	20	1	21	92	8	100
Production of bio-agents, bio-pesticides,	5	89	39	128	3	3	6	92	42	134
Repair and maintenance of farm machinery & implements	1	8	0	8	2	0	2	10	0	10
Rural crafts	3	1	45	46	0	13	13	1	58	59
Seed production	1	40	0	40	0	0	0	40	0	40
Mushroom cultivation	9	126	78	204	33	21	54	159	99	258
Tailoring, stitching, embroidery, dyeing etc.	15	158	276	434	0	75	75	158	351	509
Agril. para-workers, para-vet training	6	81	3	84	30	1	31	111	4	115
Capacity building and group dynamics	12	436	94	530	1	5	6	437	99	536
<b>Grand Total</b>	<b>131</b>	<b>2135</b>	<b>1745</b>	<b>3880</b>	<b>254</b>	<b>421</b>	<b>675</b>	<b>2389</b>	<b>2166</b>	<b>4555</b>

Vocational training conducted by the KVKs has also been presented state-wise in Table 81. Large number of vocational course were conducted in Kerala (68 courses) involving 2331 participants. KVKs in Tamil Nadu conducted 36 courses whereas, KVKs in Karnataka conducted 27 vocational courses. Out of the total of 4555 participants, 47.6 % were women (2166). Extent of women participation was the highest in Kerala (49%).



**Vocational training on mushroom value addition at Trivandrum district**

**Table 81. State/Union Territory wise break-up of the Vocational training courses**

State/UT	No. of Courses	General participants (No.)			SC/ST participants (No.)			Total participants (No.)		
		Men	Women	Total	Men	Women	Total	Men	Women	Total
Goa	0	0	0	0	0	0	0	0	0	0
Karnataka	27	419	209	628	47	194	241	466	403	869
Kerala	68	1084	972	2056	104	171	275	1188	1143	2331
Puducherry	0	0	0	0	0	0	0	0	0	0
Tamil Nadu	36	632	564	1196	103	56	159	735	620	1355
<b>TOTAL</b>	<b>131</b>	<b>2135</b>	<b>1745</b>	<b>3880</b>	<b>254</b>	<b>421</b>	<b>675</b>	<b>2389</b>	<b>2166</b>	<b>4555</b>

The summary of state-wise number of training courses under different categories of participants is given in Annexure I and the participation details of these courses based on gender are given in Annexure II.



State-wise number of training courses organized for different category of participants

Farmers and Farm Women (On+Off)	No. of Courses	Participants (No.)		
		General	SC/ST	Total
Goa	97	1607	883	2490
Karnataka	1480	49360	11123	60483
Kerala	821	26447	4123	30570
Puducherry	25	481	160	641
Tamil Nadu	1704	50272	10207	60479
<b>Total</b>	<b>4127</b>	<b>128167</b>	<b>26496</b>	<b>154663</b>
<b>Rural Youth (On+Off)</b>				
Goa	22	516	63	579
Karnataka	94	2854	981	3835
Kerala	248	6292	1217	7509
Puducherry	6	153	24	177
Tamil Nadu	182	6062	518	6580
<b>Total</b>	<b>552</b>	<b>15877</b>	<b>2803</b>	<b>18680</b>
<b>Extension Functionaries (On+Off)</b>				
Goa	7	130	25	155
Karnataka	141	4148	779	4927
Kerala	79	2345	174	2519
Puducherry	7	164	12	176
Tamil Nadu	99	3206	272	3478
<b>Total</b>	<b>333</b>	<b>9993</b>	<b>1262</b>	<b>11255</b>
<b>Sponsored Programmes</b>				
Goa	0	0	0	0
Karnataka	52	1819	240	2059
Kerala	126	5111	705	5816
Puducherry	2	29	3	32
Tamil Nadu	148	4563	996	5559
<b>Total</b>	<b>328</b>	<b>11522</b>	<b>1944</b>	<b>13466</b>
<b>Vocational Programmes</b>				
Goa	0	0	0	0
Karnataka	27	628	241	869
Kerala	68	2056	275	2331
Puducherry	0	0	0	0
Tamil Nadu	36	1196	159	1355
<b>Total</b>	<b>131</b>	<b>3880</b>	<b>675</b>	<b>4555</b>
<b>All Programmes</b>				
Goa	126	2253	971	3224
Karnataka	1794	58809	13364	72173
Kerala	1342	42251	6494	48745
Puducherry	40	827	199	1026
Tamil Nadu	2169	65299	12152	77451
<b>Grand Total</b>	<b>5471</b>	<b>169439</b>	<b>33180</b>	<b>202619</b>



**State-wise number of training courses and gender representation in different categories of training**

Farmers and Farm Women (On+Off)	No. of Courses	Participants (No.)		
		Men	Women	Total
Goa	97	1302	1188	2490
Karnataka	1480	46330	14153	60483
Kerala	821	17656	12914	30570
Puducherry	25	331	310	641
Tamil Nadu	1704	39704	20775	60479
<b>Total</b>	<b>4127</b>	<b>105323</b>	<b>49340</b>	154663
<b>Rural Youth (On+Off)</b>				
Goa	22	276	303	579
Karnataka	94	2828	1007	3835
Kerala	248	3542	3967	7509
Puducherry	6	73	104	177
Tamil Nadu	182	3268	3312	6580
<b>Total</b>	<b>552</b>	<b>9987</b>	<b>8693</b>	18680
<b>Extension Functionaries (On+Off)</b>				
Goa	7	51	104	155
Karnataka	141	3577	1350	4927
Kerala	79	1224	1295	2519
Puducherry	7	89	87	176
Tamil Nadu	99	2567	911	3478
<b>Total</b>	<b>333</b>	<b>7508</b>	<b>3747</b>	11255
<b>Sponsored Programmes</b>				
Goa	0	0	0	0
Karnataka	52	1673	386	2059
Kerala	126	3260	2556	5816
Puducherry	2	0	32	32
Tamil Nadu	148	4090	1469	5559
<b>Total</b>	<b>328</b>	<b>9023</b>	<b>4443</b>	13466
<b>Vocational Programmes</b>				
Goa	0	0	0	0
Karnataka	27	466	403	869
Kerala	68	1188	1143	2331
Puducherry	0	0	0	0
Tamil Nadu	36	735	620	1355
<b>Total</b>	<b>131</b>	<b>2389</b>	<b>2166</b>	4555
<b>All Programmes</b>				
Goa	126	1629	1595	3224
Karnataka	1794	54874	17299	72173
Kerala	1342	26870	21875	48745
Puducherry	40	493	533	1026
Tamil Nadu	2169	50364	27087	77451
<b>Grand Total</b>	<b>5471</b>	<b>134230</b>	<b>68389</b>	<b>202619</b>

### 3.1.4. Frontline extension programmes

KVKs organized a total of 1.15 lakh extension programmes and created awareness among 35.23 lakh farmers and 1.40 lakh extension personnel and public on various aspects viz., varietal performance, production technologies, Integrated Pest and Disease Management, animal health and nutrition, production technologies of poultry, fisheries and human nutrition.

KVKs are organising various extension activities by adopting individual, group and mass contact methods to accelerate the process of technology adoption by farmers. Extension programmes carried out by KVKs in coordination and collaboration with other line departments/agencies working in the district are briefly presented hereunder.

A total of 115254 extension programmes were organized through which technologies related to

agriculture and allied sectors were disseminated to 35.23 lakh farmers and 1.40 lakh extension personnel. The KVKs in Karnataka organized maximum extension programmes (51644) followed by Tamil Nadu (34526), Kerala (25617), Puducherry (2113) and Goa (1354) which was about 45%, 30%, 22%, 2% and 1%, respectively (Table 82 and Fig.4).



Field day cotton in Haveri district



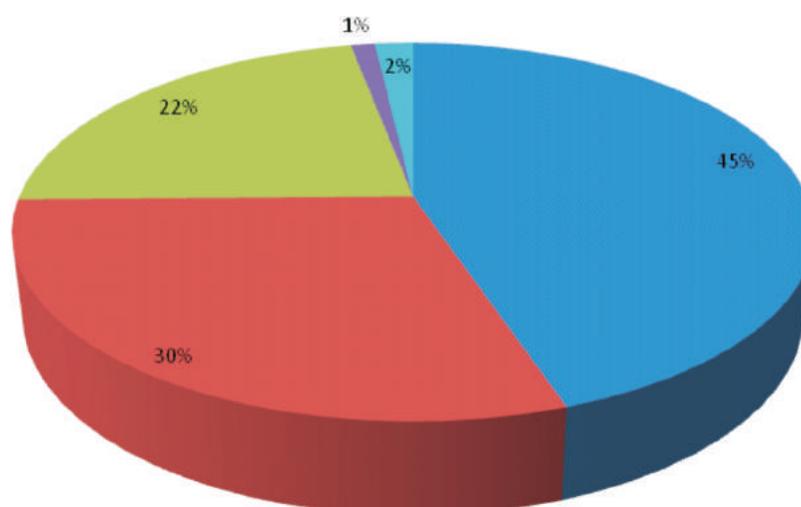
Field day on IPM in paddy in Tumkur district

**Table 82: State-wise frontline extension programmes organized and number of participants**

State	No. of programmes	No. of farmers			No. of extension personnel		
		Men	Women	Total	Men	Women	Total
Karnataka	51644	2059754	493396	2553328	77307	32340	109647
Tamil Nadu	34526	279329	99328	378657	13436	5182	18618
Kerala	25617	305804	231705	537509	5232	4986	10218
Goa	1354	29505	13469	42974	195	140	335
Puducherry	2113	7215	3803	11018	1083	524	1607
<b>Total</b>	<b>115254</b>	<b>2681607</b>	<b>841701</b>	<b>3523486</b>	<b>97253</b>	<b>43172</b>	<b>140425</b>

Details of activity-wise extension programmes organized in Zone VIII by KVKs are furnished in Table 83. Data implies that KVKs made more efforts on advisory services (56167), farmers visit to KVK (36950), scientists' visit to farmers' fields (8143), diagnostic visits (3749), lectures delivered as resource persons (2664), method demonstrations (1593), field days (1175) were

the major activities. Further, KVKs organized/took part in 370 exhibitions in which 25.75 lakh and 0.89 lakh extension personnel participated. KVKs organized 90 Kisan Melas wherein 1.78 lakh farmers and 0.04 lakh extension personnel participated. Details are given below:



**Fig.4 : State-wise per cent of frontline extension programmes organised**

■ Karnataka ■ Tamil Nadu ■ Kerala ■ Goa ■ Puducherry

**Table 83 : Activity-wise extension programmes organized by KVKs in Zoon VIII and number of participants**

Activity	No. of programmes	No. of farmers			No. of extension personnel		
		Men	Women	Total	Men	Women	Total
Advisory services	56167	257263	71460	328817	2518	1216	3734
Farmers visit to KVK	36950	48639	16881	65520	4892	1923	6815
Scientists visit to farmers fields	8143	20516	5970	26486	678	269	947
Diagnostic visits	3749	11304	3905	15209	695	372	1067
Lectures delivered as resource persons	2664	100857	32647	133504	9280	3190	12470
Method demonstrations	1593	19414	6597	26011	1253	570	1823
Field days	1175	22309	6439	28748	2725	1073	3798
Film shows	853	16431	5774	22205	3415	538	3953
Group meetings	821	9733	3559	13292	831	303	1134
Exposure visits	709	15460	5539	20999	626	321	947

(Contd...)

Activity	No. of programmes	No. of farmers			No. of extension personnel		
		Men	Women	Total	Men	Women	Total
Others	572	15127	5534	20761	2179	730	2909
Plant/Animal Health Camps	499	5893	2167	8060	345	123	468
Exhibitions	370	1952255	623084	2575339	59936	29517	89453
Farmers seminars/workshops	314	16336	8119	24455	2389	1269	3658
SHG convenors meetings	242	2189	3352	5525	82	38	120
Celebration of important days	213	12264	10272	22536	1620	540	2160
Kisan melas	90	149685	28793	178478	3287	1016	4303
Soil health campaign	59	2870	885	3755	117	60	177
Kisan Gosthies	44	2368	351	2719	334	91	425
Ex-trainees Sammelan	27	694	373	1067	51	13	64
<b>Total</b>	<b>115254</b>	<b>2681607</b>	<b>841701</b>	<b>3523486</b>	<b>97253</b>	<b>43172</b>	<b>140425</b>

KVKs disseminated technologies through newspaper coverage (1980), extension literature (1018), popular articles (601), radio talks (444), T V talks (340), newsletter issues (165), technical bulletins (95). In addition, 200 research papers, and 50 books/book chapters were also

published. Further, KVKs developed 302 video CDs/DVDs on various technologies and made them available for sale to farmers and other stakeholders. State-wise details are presented in Table 84.

**Table 84 : State-wise extension programmes organized for mass contact**

Activity	Number					Total (No.)
	Karnataka	Tamil Nadu	Kerala	Goa	Puducherry	
Research papers	82	79	39	0	0	200
Technical bulletins	59	26	8	1	1	95
Popular articles	277	254	62	0	8	601
Extension literature	386	530	86	0	16	1018
Newspaper coverage	1058	617	287	3	15	1980
Books/book chapters	7	25	17	0	1	50
Newsletter issues	78	62	20	1	4	165
Radio talks	174	211	50	1	8	444
TV talks	126	190	23	0	1	340
CD/DVD	246	48	6	1	1	302



**Animal health camp in Dharwad district**



**Farm women group discussion meeting in Tuticorin district**

### 3.1.5 Technology week

KVKs observe technology week for 4-6 days to create awareness among farmers and other stakeholders about the latest technologies in agriculture and its allied sectors. Besides, it also provides a forum to discuss the latest issues, problems and strategies for arriving at probable solutions. The major technical agenda include guest lectures, visit to demonstration units/plots inside the KVK campus, exhibition on latest technologies, film shows, group discussions etc. During the period under report, 27 KVKs of the Zone; viz., 14 in Karnataka, 7 in Kerala and 6 in Tamil Nadu organized technology week, in which a total of 65736 farmers participated. These programmes were organized in convergence with 411 agencies. In addition, 2.8 t seeds of high yielding varieties/hybrid seeds, 21199 planting materials and 7.2 t of bio-products were made available for sale to farmers.

### 3.1.6 Kisan Mobile Advisory Services (KIMAS)

Kisan Mobile Advisory Service is one of the Information and Communication Technology (ICT) tools for dissemination of requisite and need based information at the right time to the right people. KVKs are sending information via text or voice messaging to registered farmers advising them on the vital issues of agricultural importance. Accordingly 41 KVKs have advised farmers regularly on the areas of crops, livestock, other enterprises, weather, marketing and awareness of latest agricultural technologies through text messages, voice calls and both depending on the expertise available with them. During the reporting period, a total of 4,063 text messages and 2,847 voice messages were sent to farmers. Among these communications major share was of crops (6910) followed by awareness (1569), livestock (1320), other enterprises (1059), weather (827) and other marketing (736). The details are presented in Table 85.

**Table 85: Details of State-wise SMS/Voice calls sent on various priority areas.**

Name of State	No of KVKs	Message Type	Crop	Lives-tock	Weather	Market-ing	Aware-ness	Other enterprise	Total
Karnataka	29	Text only	1731	203	269	198	509	341	3251
	6	Voice only	33	19	16	16	19	18	121
	<b>Total</b>		<b>1764</b>	<b>222</b>	<b>285</b>	<b>214</b>	<b>528</b>	<b>359</b>	<b>3372</b>
Tamil Nadu	26	Text only	2016	615	246	283	491	419	4070
	3	Voice only	458	331	150	8	263	80	1290
	<b>Total</b>		<b>2474</b>	<b>946</b>	<b>396</b>	<b>291</b>	<b>754</b>	<b>499</b>	<b>5360</b>
Kerala	7	Text only	291	100	132	131	101	55	810
	3	Voice only	2351	52	14	34	96	76	2623
	<b>Total</b>		<b>2642</b>	<b>152</b>	<b>146</b>	<b>165</b>	<b>197</b>	<b>131</b>	<b>3433</b>
Goa	1	Text only	20	0	0	0	0	6	26
		Voice only	5	0	0	33	45	32	115
Zone-VIII	63	Text only	4063	918	647	645	1146	853	8272
	13	Voice only	2847	402	180	91	423	206	4149
<b>Zone-VIII Total</b>			<b>6910</b>	<b>1320</b>	<b>827</b>	<b>736</b>	<b>1569</b>	<b>1059</b>	<b>12421</b>



### 3.1.7 E-Connectivity

During the XI Plan Period, ICAR aimed for improving information and communication in KVK system, provided e-linkage to its network of KVKs and Zonal Project Directorates. Under the e-connectivity project, E-Linkage was established in 37 KVKs along with ICAR-Zonal Project Directorate, Zone-VIII, Bengaluru with technical guidance and execution by ERNET India. State-wise list of KVKs provided with e-linkage is given in Table 86. These KVKs were connected electronically through VSAT and to

the hub established at New Delhi. The communication between KVKs across the country through IP phones was enabled by providing IP phone numbers. KVK staff were regularly apprised of the latest technologies through guest lectures by eminent scientists in the respective fields and other communications through e-connectivity/video conferencing. Using these facility e-seminars were webcasted from KVK hub, New Delhi involving experts in the field covering various topics of interest to KVKs during the year.

**Table 86: KVKs with e-linkage facility**

States	No. of KVKs	Districts
Karnataka	11	Raichur, Bidar, Gulbarga, Haveri, Hassan, Mandya, Chitradurga, Chickmagalur, Mysore, Belgaum, Gadag
Tamil Nadu	14	Salem, Cuddalore, Trichy, Pudukottai, Vellore, Ramanathapuram, Madurai, Kancheepuram, Dindigul, The Nilgiris, Thiruvannamalai, Erode, Tuticorin, Karur
Kerala	10	Palghat, Kollam, Wyanad, Kannur, Malappuram, Thrissur, Kasaragod, Calicut, Trivandrum, Pathanamthitta
Goa	1	North Goa
Puducherry	1	Puducherry

### 3.1.8 Production of technological inputs

Timely availability of good quality seeds, planting materials, livestock breeds and bio-products is a prerequisite for achieving potential

yield in agriculture and allied sectors. KVKs are playing an important role in making available these inputs for the needy farmers.

#### Quality technological products

During the year, KVKs of Zone VIII produced and supplied 486.23 t of seeds of different crop varieties, 34.50 lakh planting materials of different crops and hybrids, 11.94 t of bio-products, 2.18 lakh of livestock strains, fish fingerlings and other bio products benefiting 2.91 lakh farmers.



During the period under report, KVKs produced 486.23 t seeds of crop varieties, 11.94 t bio-products, 28.65 lakh number of planting materials of varieties, 5.85 lakh number of planting materials of hybrids, 1.39 lakh livestock

and fisheries, 0.79 lakh of other bio products and supplied to 1.04 lakh, 0.58 lakh, 0.75 lakh, 0.32 lakh, 0.15 lakh and 0.07 lakh farmers, respectively (Table 87).

**Table 87: Production and supply of technological inputs by KVKs**

Category	Quantity	Value (Rs. in lakh)	Farmers (no. in lakh)
Seeds of crop varieties (q)	4862.34	425.77	1.04
Bio-products (q)	119.48	179.58	0.58
Other bio-products (no. in lakh)	0.79	23.27	0.07
Planting materials of crops (no. in lakh)	28.65	114.26	0.75
Planting materials of crop hybrids (no. in lakh)	5.85	9.92	0.32
Livestock and fisheries (no. in lakh)	1.39	77.79	0.15

**(A) Seeds:** State wise details of seeds produced by KVKs of Zone VIII (Table 88) show that KVKs in Karnataka produced the highest quantity of seeds (2198.21 q) followed by those of Tamil Nadu (1722.02 q), Puducherry (719.54 q), Kerala (128.24 q) and Goa (94.33 q). Data in Table 89 shows that highest quantity of seed produce was of cereals (2923.01q) followed by

that of fodders (653.72 q), pulses (385.30 q), oilseeds (276.31q), millets (223.57 q), vegetables (195.04 q), tubers (127.59q), commercial (42.12 q), spices (23.89 q), fibers crops (8.24 q), flowers (3.03 q), medicinal and aromatics (0.33 q) and fruits (0.19 q). The seeds thus produced were supplied to 104351 farmers.

**Table 88: State-wise production and supply of seeds by KVKs**

State	Quantity (q)	Seeds Value (Rs.)	Farmers (no.)
Karnataka	2198.21	8876063.079	9996
Tamil Nadu	1722.02	28399757.19	15392
Puducherry	719.54	1764105	1925
Kerala	128.24	3328590.55	76652
Goa	94.33	208621	386
<b>Total</b>	<b>4862.34</b>	<b>42577136.82</b>	<b>104351</b>

**Table 89 : Crop category-wise production and supply of seeds by KVKs**

Crop category	Quantity (q)	Seeds Value (Rs.)	Farmers (no.)
Cereals	2923.01	7693677.02	8942
Fodders	653.72	24314536.50	7163
Pulses	385.30	4099644.92	3614
Oilseeds	276.31	1569953.20	1154
Millets	223.57	740076.68	1472
Vegetables	195.04	3896986.05	81208
Tubers	127.59	12993.75	133
Commercial crops	42.12	69116.70	25
Spices	23.89	101447.00	549
Fibers	8.24	50650.00	23
Flowers	3.03	23475.00	27
Medicinal and Aromatics	0.33	3630.00	11
Fruit	0.19	950.00	30
<b>Total</b>	<b>4862.34</b>	<b>42577136.82</b>	<b>104351</b>

**(B) Planting material:** State-wise details pertaining to production of planting material by KVKs of Zone VIII is presented in Table 90. Data indicate that KVKs in Tamil Nadu produced the highest number of planting material (1796570) of crops followed by KVKs in Karnataka (528310), Kerala (498817), Goa (24603) and Puducherry (17625). Data in Table 91 shows that the

maximum quantity of planting material was fodder slips (1863966) and the rest was seedlings of vegetables (429217), plantations (149761), fruits (130556), spices (91495), pulses (61000), commercial (46100), flowers (43762), ornamentals (30120), forest species (13282), medicinal and aromatics (4916) and tubers (1750) and supplied to 75053 farmers.



Nursery unit at KVK Shimoga



Fodder cafeteria KVK Thiruvarur

**Table 90 : State-wise production and supply of planting materials by KVKs**

State	Quantity (no.)	Planting materials	
		Value (Rs.)	Farmers (no.)
Tamil Nadu	1796570	3100297.49	11642
Karnataka	528310	3749175.00	7378
Kerala	498817	4092335.18	50330
Goa	24603	411496.00	4914
Puducherry	17625	73301.00	789
<b>Total</b>	<b>2865925</b>	<b>11426604.67</b>	<b>75053</b>

**Table 91: Crop category-wise production and supply of planting materials by KVKs**

Crop category	Planting materials		
	Quantity (no.)	Value (Rs.)	Farmers (no.)
Fodder	1863966	1106209.83	3480
Vegetables	429217	1125201.34	22805
Plantations	149761	2964545	5513
Fruits	130556	3722284	16798
Spices	91495	1412778	16190
Pulses	61000	78988	20
Commercial	46100	142850	24
Flowers	43762	220271	1380
Ornamentals	30120	381464.68	3440
Forest species	13282	169460.82	2508
Medicinal and Aromatics	4916	95241	1560
Tubers	1750	7311	1335
<b>Total</b>	<b>2865925</b>	<b>11426604.67</b>	<b>75053</b>

**(C) Hybrid planting material:** State-wise details pertaining to production of planting material of hybrids by KVKs of Zone VIII is presented in Table 92. Data indicate that KVKs in Kerala produced highest number of hybrid planting materials (301742) followed by KVKs in Karnataka (173531) and Tamil Nadu (110141).

In the case of crops, more number of hybrid seedlings of cabbage (165916) were produced followed by cauliflower (131026), tomato (120932), chilli (102434), brinjal (31405), marigold (21755), papaya (11541) and sapota (405) and supplied to 32631 farmers (Table 93).

**Table 92 : State-wise production of planting materials of crop hybrid by KVKs**

State	Planting materials of hybrid		
	Quantity (no.)	Value (Rs.)	Farmers (no.)
Kerala	301742	719776	32116
Karnataka	173531	181766.25	265
Tamil Nadu	110141	90976.5	250
<b>Total</b>	<b>585414</b>	<b>992518.75</b>	<b>32631</b>

**Table 93 : Crop category-wise production of planting material of hybrids by KVKs**

Crop category	Planting materials of hybrid		
	Quantity (no.)	Value (Rs.)	Farmers (no.)
Cabbage	165916	350393	16033
Cauliflower	131026	273383	16059
Tomato	120932	60526	155
Chilli	102434	58927.8	158
Brinjal	31405	21827.7	82
Marigold	21755	47851.25	19
Papaya	11541	163410	113
Sapota	405	16200	12
<b>Total</b>	<b>585414</b>	<b>992518.75</b>	<b>32631</b>

**(D) Bio-products:** State-wise details pertaining to production of bio-products by KVKs of Zone VIII is presented in Table 94. Data indicate that during the year KVKs in Puducherry produced largest quantity of bio-products (7958.37q) followed by KVKs in Tamil Nadu (2139.02 q), Kerala (1204.99 q), Karnataka (605.11q) and Goa (41.07 q). Data regarding category wise production of bio-products is presented in Table 95. Of the total production, largest quantity of

production was bio-agents (7855.88 q) followed by organic manures (1300.95 q), bio-fertilizers (1204.59 q), bio-fungicides (852.08 q), bio-pesticides (357.14 q), micro nutrient mixtures (275.65 q) and mushroom spawn (167.49 q) were produced. Further, KVKs produced 49000 number of EPN, 24327 pheromone traps, 5600 *Acerophagus papaya* and 727 Trico cards (Table 96).

**Table 94: State-wise production of bio-products by KVKs**

State	Bio products		
	Quantity (q)	Value (Rs.)	Farmers (no.)
Puducherry	7958.37	1036072.85	1471
Tamil Nadu	2139.02	2394399	6208
Kerala	1204.99	10128067.13	37007
Karnataka	605.11	4359185.45	12654
Goa	41.07	40958.38	1234
<b>Total</b>	<b>11948.56</b>	<b>17958682.81</b>	<b>58574</b>

**Table 95: Category-wise production of bio-products by KVKs**

Category	Bio products		
	Quantity (q)	Value (Rs.)	Farmers (no.)
Bio-agents	7855.88	434228.125	1102
Organic manures	1300.95	1012296.88	4266
Bio-fertilisers	1204.59	759575.2	6808
Bio-fungicides	786.86	7118202.85	20958
Bio-pesticides	357.14	3736502.5	10360
Micronutrient mixtures	275.65	4195277.25	12904
Mushroom spawn	167.49	702600	2176
<b>Total</b>	<b>11948.56</b>	<b>17958682.81</b>	<b>58574</b>

**Table 96: Production of other bio-products by KVKs**

Category	Other bio products		
	Quantity (no.)	Value (Rs.)	Farmers (no.)
EPN	49000	49000	548
Pheromone traps	24327	2260680	7194
<i>Acerophagus papayae</i>	5600	Free	90
Trico cards	727	18175	141
<b>Total</b>	<b>79654</b>	<b>2327855</b>	<b>7973</b>

### Bio products

KVKs produced and supplied 1194.85 t of bio products, 49000 numbers of EPN, 24327 pheromone traps, 5600 *Acerophagus papayae* (*papaya mealybug* parasitoids), and 727 Trico cards through which nearly 66547 farmers were motivated to adopt bio-control by reducing use of chemicals.

**(E) Livestock and fisheries:** State-wise detail pertaining to production of livestock and fisheries by KVKs of Zone VIII is presented in Table 97. Data indicate that KVKs in Puducherry produced largest quantity of livestock materials and fisheries (45356 numbers) followed by Kerala (44706), Tamil Nadu (31968), Karnataka (14829)

and Goa (2220). Of total production, maximum (69340) was under poultry followed by fish fingerlings (53411), poultry-egg (13026), Ornamental fish (2332), goat and sheep (535), dairy animals (157), piggery (157) and rabbitry (121)(Table 98).

**Table 97: State-wise production of livestock and fisheries**

State	Livestock and fisheries		
	Quantity (n0.)	Value (Rs.)	Farmers (no.)
Puducherry	45356	121718.5	207
Kerala	44706	2922259	6593
Tamil Nadu	31968	3189731.5	5587
Karnataka	14829	1323168	1959
Goa	2220	222404	731
<b>Total</b>	<b>139079</b>	<b>7779281</b>	<b>15077</b>

**Table 98 : Category-wise production of livestock and fisheries**

Category	Livestock and fisheries		
	Quantity (no.)	Value (Rs.)	Farmers (no.)
Poultry	69340	5337947	9699
Fish fingerlings	53411	178660.5	871
Poultry egg	13026	139042.5	3465
Ornamental fish	2332	23036	288
Goat and sheep	535	1270897	386
Dairy animals	157	380490	67
Piggery	157	416574	74
Rabbitry	121	32634	227
<b>Total</b>	<b>139079</b>	<b>7779281</b>	<b>15077</b>



### KVKs in Karnataka

**Seeds:** Produced 219.82 t of seeds of different crops, of which paddy seeds ranked first with 100.57 t followed by 19.02 t seeds of soybean, 18.27 t seeds of finger millet, 14.39 t seeds of bengalgram, 11.39 t seeds of pigeonpea and 11.32 t seeds of sorghum and seeds of other crops.

**Planting material:** Produced a total number of 5.28 lakh seedlings, of which bajra napier fodder occupied first rank with 198050 seed sets followed by 60004 seedlings of pigeonpea, 34635 seedlings of drumstick, 32907 seedlings of lime and 22000 seedlings of tuberoses and seedlings of other crops.

### KVKs in Tamil Nadu

**Seeds:** Produced 172.20 t of seeds of different crops, of which paddy seeds occupied first place with 77.52 t followed by 55.66 t seeds of fodder sorghum, 12 t seed material of cassava, 4.56 t seeds of groundnut, 2.69 t seeds of hedge lucerne and seeds of other crops.

**Planting material:** Produced a total number of 17.96 lakh, of which bajra napier grass occupied first place with 15.54 lakh seed sets followed by 75330 seedlings of fodder sorghum, 30168 seedlings of brinjal, 25900 seedlings of mulberry, 23240 seedlings of chillies, 11331 seedlings of coconut and seedlings of other crops.

### KVKs in Kerala

**Seeds:** Produced 12.82 t of seeds of different crops, of which paddy seeds ranked first with 9.00 t followed by 1.00 t seeds of cowpea, 0.78 t seed rhizomes of turmeric, 0.33 t seed tubers of elephant foot yam, 0.32 t seeds of bhendi and seeds of other crops.

**Planting material:** Produced a total number of 4.98 lakh seedlings, of which chillies occupied first rank with 1.51 lakh seedlings followed by 57409 rooted cuttings of blackpepper, 46105 seedlings of arecanut, 45000 seedlings of onion, 35800 seedlings of brinjal and seedlings of other crops.



### **KVKs in Goa**

Produced 9.43 t of seeds of different crops, of which maximum were paddy seeds (9.30 t) and other crops includes cowpea, field bean and amaranthus. Further, produced a total number of 24603 seedlings, of which, coconut occupied first rank with 4920 seedlings followed by 4459 each seedlings of chillies and onion, 3354 seedlings of mango, 2457 seedlings of bougainvillea, 902 rooted cuttings of blackpepper and seedlings of other crops.

### **KVKs in Puducherry**

Produced 71.95 t of seeds of different crops, of which maximum production occupied by paddy seeds (71.61 t) and other crops includes sesame, blackgram and greengram. Further, produced a total number of 17625 seedlings, of which, brinjal occupied first rank with 6100 seedlings followed by 5280 seedlings of chillies, 1183 seedlings of teak, 1095 seedlings of herbal plants, 1083 seedlings of jasmine, 948 seedlings of marigold and seedlings of other crops.

### 3.1.9 Soil, Water and Plant Analysis

A total of 67 KVKs have established soil, water and plant analyzing laboratory and are carrying out the analysis of 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 recommendation for conducting FLDs and OFTs as well rendering advisory services on nutrient

based recommendations to the farmers. During the year, a total of 41538 samples of soil, water, plant, manure and leaf tissue received from 36117 farmers belonging to 20876 villages were analyzed with realization of Rs. 34.32 lakh (Table 99). State-wise data showed that KVKs in Karnataka analyzed samples (24751) followed by Kerala (8524), Tamil Nadu (7700), Goa (289) and Puducherry (274) (Table 100).

**Table 99: Details of samples analyzed by KVKs during 2014-15**

Type of sample	No. of samples	No. of Farmers	No. of villages	Amount realized (Rs.)
Soil samples	29897	25138	13979	2678351
Water samples	11007	10682	6730	708013
Plant samples	417	196	68	26915
Manure samples	128	89	87	10080
Leaf Tissue Analysis	89	12	12	8900
<b>Total</b>	<b>41538</b>	<b>36117</b>	<b>20876</b>	<b>3432259</b>

**Table 100: State-wise soil, water, plant analysis undertaken by KVKs during 2014-15**

Type of sample	No. of samples	No. of farmers	No. of villages	Amount realized (Rs.)
Kerala	8524	7930	5043	1016254
Karnataka	24751	22977	12952	2142674
Tamil Nadu	7700	4865	2799	249938
Puducherry	274	66	35	10580
Goa	289	279	47	12813
<b>Total</b>	<b>41538</b>	<b>36117</b>	<b>20876</b>	<b>3432259</b>

### 3.1.10 Rainwater Harvesting Units

Rainwater harvesting units with micro irrigation system were established in 16 KVKs. A total of 56 training courses and 183 demonstrations were conducted and 15025

planting materials were produced utilizing this facility. Further, 17028 farmers and 916 officials visited these units and got acquainted with the rainwater harvesting techniques.



### 3.1.11 Convergence and Linkages :

During the period under report, KVKs continued their linkage with various organizations and agencies while discharging their responsibilities as agricultural science centres in the district level.

**Nature of linkages:** KVKs converged with the development departments of their districts for sharing technology and information through bi-monthly workshops, seminars, technology weeks, frontline demonstrations, field days, farmers-scientists interface and *kisangoshti mela*. Capacity development of extension personnel was ensured through training, farm schools and farmers field schools. Capacity development and confidence building of extension personnel of development departments were also undertaken by involving them in on farm testing. Extension activities were conducted by involving all stakeholders including media, local institutions, district administration and people's representatives. Diagnostic field visits and joint

field visits with development departments were carried out to problematic fields and to identify emerging problems, if any. KVKs supported all the development departments by providing technical backstopping necessary in implementing various schemes and programmes.

KVKs facilitated farmers and farmer groups to avail various provisions of banking sector like NABARD, Lead Banks, Cooperatives and Regional Banks during entrepreneurial activities. Non-government organizations were supported by the KVKs with technical support and by making available quality critical inputs. Local bodies and NGOs were involved during mobilization of farmers / farm women into groups, organizations and companies. Input companies were involved at the time of conduct of exhibitions and melas.

Several externally funded projects and activities were carried out by the KVKs during the period. Details are given below.

**Table : 101 Details of external funding received by the KVKs through convergence and linkages**

Agency	No. of KVKs involved	Amount received (Rs.)
Protection of Plant Varieties and Farmers Rights Authority (PPVFRA)	42	3360000
Agricultural Technology Management Agency (ATMA)	24	2477445
Coconut Development Board	20	1799700
Rashtriya Krishi Vikas Yojana (RKVY)	13	21170850
State Agriculture Department	13	5275620
State Department of Women and Child Development	10	190800
State Animal Husbandry Department	7	456440
National Horticulture Mission (NHM)	6	4364122
State Horticulture Department	5	472099
Directorate of Cashewnut and Cocoa Development	4	338500
ICAR Institutes	3	918000
National Bank for Agriculture and Rural Development (NABARD)	3	1028500
State Forest Department	2	40950
Coffee Board	1	91080
State Planning Board, Kerala	1	9151280
Others	24	18245155
<b>Total</b>		<b>69380541</b>



**Linkage with ATMA :** Specific activities carried out by the KVKs in collaboration/convergence with ATMA are given below:

**Table : 102 Details of linkage with ATMA by the KVKs**

Programme	No. of KVKs involved	No. of programmes attended by KVK staff	No. of programmes Organized by KVK
Meetings	34	241	42
Research projects	7	12	10
Training programmes	44	513	115
Demonstrations	19	141	62
Extension Programmes	13	20	12
Technology Week	13	19	19
Exposure visit	14	81	19
Exhibition	18	22	16
Soil health camps	5	49	6
Animal Health Campaigns	5	49	6
Diagnostic visits	4	185	4
Farm Schools	15	65	14
Farmers -Scientists Interactions	5	16	2
Video Films	2	4	2
Books	2	14	10
Extension Literature	3	14	55
Pamphlets	4	33	45
Other Activities			
Watershed approach	3	5	3
Integrated Farm Development	2	6	2
Agri-preneurs development	3	7	4
<b>Total</b>		<b>1496</b>	<b>448</b>

### 3.1.12 Prosperity of farmers through technological interventions

#### (i) Finger millet cv. ML 365 withstands drought and blast disease

During kharif season the farmers of Karepura of Doddaballapur taluk were growing early and medium duration, high yielding finger millet cv. MR-1. Cv and GPU-28 in rabi season in medium soils after pulses. Scientists from KVK, Bengaluru Rural conducted a study on cultivation of finger millet and its yield potential in the farmers' fields. The cause for low yield was analyzed by farmers through a guided problem-cause analysis. The major cause for low yield of finger millet in the village was drought and blast



A view of field performance of ML-365 and its harvest

incidence. Twenty five interested farmers of the village were selected and Frontline Demonstrations on Finger millet cv.ML-365 were conducted with the selected farmers in an area of 10 ha.

Finger millet cv. ML-365 matures early and is tolerant to drought and resistance to blast disease besides having high yield potential. This variety was introduced to the farmers as front line demonstration. The KVK scientists assisted farmers on the production technology in different growth stages of the crop.

The farmers harvested 24.24 q finger millet per ha realizing a net income of Rs. 20172/ha as against the farmers practiced finger

millet cv GPU-28 gave 18 q/ha with a net profit of Rs.28000/ha. The farmers produced good quality seed and their produce was linked to National Seed Project, UAS, Bengaluru for seed purpose. The farmers expressed satisfaction and happiness about the performance of finger millet cv.ML-365 which withstood moisture stress during grain filling stage. It also exhibited uniform maturity besides retaining green straw even at the harvesting stage.



#### (ii). Roopa Rajendra becomes an entrepreneur by adding value to finger millet

Finger millet is a major staple food crop of Chikkaballapura district. It is a coarse grain called “nutritious millet”. It is extensively consumed in daily diet by the people of the region in the form of dumpling. Finger millet has certain intrinsic quality suited for developing value added products. KVK, Chikkaballapura is being conducting skill training on value addition to finger millet. Among ex-trainees of KVK, Chikkaballapura, 5 trainees under the leadership of Smt. Roopa Rajendra came forward to take up





**(iii). Multiple vegetable cropping with Poly mulch and Drip Irrigation – An effort worth emulating**

Smt. Saroja G.C, is a progressive farmer of Devarayapatna village of Tumkur district, Karnataka. She successfully cultivates vegetables in her 2 acres farm by adopting water and labour saving technologies. Before coming into contact with KVK, Tumkur-A (Hirahalli), she was unable to meet both ends by cultivating her small farm. She came to know about the KVK Tumkur A through a training programme in 2013 and ever since has been taking technical guidance from the SMS (Horti) for profitable vegetable cultivation. The KVK has been guiding her from time to time in the cultivation of summer tomato followed by French bean and marigold with poly mulch and drip irrigation in one acre of land.

She transplanted the tomato (Arka Samrat) seedlings on raised beds with poly mulch film laid with drip irrigation. She harvested 32.5 t tomatoes 65 days after planting and realized a total income of Rs. 3.25 lakh from her one acre. The total cost of cultivation for tomato was Rs.60000 per acre. Thus, she earned a net profit of Rs. 2.65 lakh per acre (BC ratio 5.41). Immediately after tomato, she took up French bean (pole bean) as a second crop by using the same poly mulch with drip irrigation. She harvested 3.5 t french bean 55 days after sowing earning a gross income was Rs.77000. The expenditure was only Rs. 12500 and thus the net profit was Rs. 64500. Soon after the harvest of second crop, she planted the cuttings of marigold cv.Arka Bangara released by IIHR recently. This

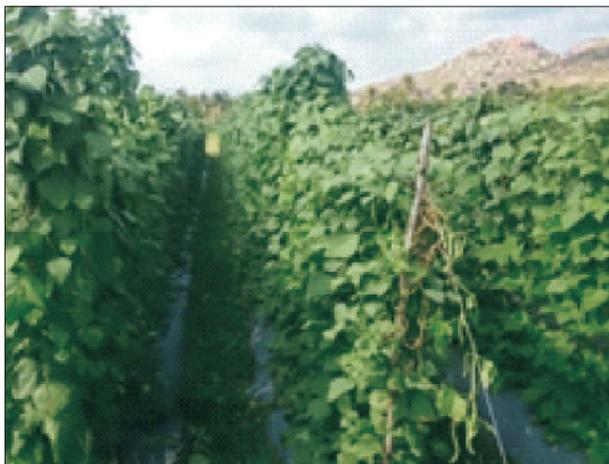
was the third crop raised by her under the same poly mulch. Marigold was harvested 45 days after planting. Flower yield was 1800 kg which was sold at Rs. 20/kg realizing a gross income of Rs. 36000. With the cost of cultivation at Rs.8500 she earned a net profit of Rs.27500. By cultivating multiple crops consecutively using same poly mulch and drip irrigation followed by recommended package of practices of these three crops viz., tomato, French bean and marigold, she could earn a total net income of Rs. 3.57 lakh per acre per annum.

Poly mulch helped in moisture conservation and weed suppression, improved efficiency of fertilizer use by plants and minimized the incidences of pests and viral diseases there by reducing the cost of cultivation. Further, number of seedlings required for planting one acre was also less because of the decreased seedling mortality under poly mulch. The fruits and flowers harvested were of better quality and colour, which fetched higher prices in the market. Multiple cropping with rotation of solanaceous crops with a leguminous crop was shown as a better option to reap more benefits from the investment made on poly mulch and drip irrigation. However, proper installation of a good quality plastic mulch and drip tube is absolutely necessary for successful multiple cropping.

Smt. Saroja received innovative farm woman award by IIHR on her success during ICAR foundation day held on 18<sup>th</sup> July 2014. She is acting as a role model for the farm women of her and neighbouring villages.



**Tomato as first crop with poly mulch and drip irrigation and its harvest**



**French bean as second crop with poly mulch and drip irrigation**

**Marigold as third crop with poly mulch and drip irrigation**

**(iv). Backyard Poultry-helps improve family livelihood security**

Smt. Sharada Bai residing in Chandurayanalli of Magadi Taluk in Ramanagara District owns 20 guntas of land. Under IFSD Programme, seven Giriraja chicks were inducted to integrate farming of Smt. Sharada Bai with an objective of improving the livelihood status of the family.

In addition to the seven Giriraja birds, she had bought another 10 local chicks. Within a period of 8 months, chicks grew to 110 numbers under the guidance of KVK, Ramanagara. Smt. Sharada Bai took poultry as a challenging enterprise and now she is selling about 300-350 eggs per month earning about Rs.2100-Rs.2450 @ Rs.7 per egg. Auxiliary to this as and when the chicks attain the

weight of 2.5 kg, they are disposed for table purpose @ Rs. 250/kg. Thus she is earning Rs.3750 by selling minimum of 12.5 kg chicken



**A view of Smt. Sharada Bai's backyard poultry**



(5 birds) once in 3 months. She is not incurring high cost towards feed instead the birds are fed with locally available feed (ragi, food waste, etc) and a part with commercial feed. In addition she is spending Rs.1000 towards veterinary expenses per year. Apart from the meager income from horticultural crops, the earning from poultry is a good livelihood support to her family. Overall, Smt. Sharada Bai is earning an income of Rs. 1754 per month from the backyard poultry. The KVK has introduced duck rearing to her and diversified her tiny enterprise.

**(v). Aiswaryasree kudumbasree an all-women food processing company re-writes story of women empowerment**

A decade before, Smt. Suharaa school educated lady of very modes background in Thirumittakode, teamed up with about 20 women of the same background and established a food processing unit. This came to be known as Aiswaryasree Kudumbasree unit which obtained financial support from various departments including Kudumbasree. KVK Palghat stated provided technical guidance to the group for producing and marketing high quality food products. Since its establishment in December 2006, the group members have attended training programmes offered by KVK and other departments to update their knowledge and skill for preparation of different food products. The unit was modernized with the state of the art machinery including pulveriser, roaster, blender, sealing machine etc. and all the 20 women are employee-cum-shareholders of this unit. The major food products of the unit are puttu rice flour, chembaputtu rice flour, pathiri, idiyappam flour, jam, squash, and spice mixes and are marketed under the brand name “Nellara”. Now the unit has an annual turnover of Rs.1.5 crore.

Every year the group is able to earn a dividend of Rs. 20 lakh of which Rs13 lakh is dividee among members. Each member is able to draw Rs.6000 per month as salary and a bonus of Rs.10000 at the end of financial year. An allowance of Rs. 1000 is given for all members during major festivals. Recently the Unit has added the preparation of health food mix “Teen Plus” under the technical guidance of KVK. More than 5.00 t of “Teen Plus” was supplied to different Anganwadis of the district. Aiswaryasree Kudumbasree participates in exhibitions and melas organized by different organizations.



**A view of Aiswaryasree Kudumbasree unit**



**Dr. Sreenath Dixit, Zonal Project Director, Zone VIII, Bengaluru visits the unit**

**(vi). Honey bees ensure sustainable livelihood**

Shri. P. Ramachandra resource poor farm farmer belongs to Badiadka village in Kasaragod district. His family owns around 50 cents of land which is highly lateritic in nature. He has 27



cashew plants, 12 coconut palms and also cultivates some vegetables for household consumption in this small patch of land. He was one of the 42 trainees who attended the vocational training programmes on bee keeping organized by KVK Kasaragod during the year 2011 - 2012 in collaboration with SHM Kerala and Kasaragod Rural Development Society. His life took a new turn after his exposure to this training programme of 15 days duration. He started with 10 bee colonies with the technical and logistical support from KVK for which 50% subsidy was made available to him through HortiCorp, Thiruvananthapuram. Further, through domestication of natural colonies, he established 10 more colonies. In the meantime, he was also trained on stingless bee keeping and he started melliponiculture, as it requires only limited resources.

In the first year, he sold 36 Indian bee colonies while during the second year he sold 67 of them besides five stingless bee colonies. He was able to earn around Rs.55000 from the sales of Indian bee colonies, Rs. 5000 from stingless bee colonies. He also sold honey worth Rs. 8000. At present he has 35 Indian bee colonies and 25 stingless bee colonies in his breeding unit. He has observed that the bee keeping has resulted in around 15 – 20% yield increase in coconut, cashew and vegetable crops.

After seeing the success, colonies were taken by around 45 farmers/bee keepers. Shri. Ramachandra is an active member of the KVK Honey Group, a group formed by KVK ex-trainees for production and marketing of organic honey under the brand name, Keramadhu Kasaragod Honey.



A view of honey unit of Shri Ramachandra

**(vii). Mechanization in paddy creates jobs in Tamil Nadu**

Paddy is one of the major crops of Kanyakumari District. It occupies more than 17000 ha during both 'Kannipoo'(Kharif) and 'Kumba poo' (Rabi) seasons of the year. The conventional paddy cultivation practice is not profitable owing to low productivity and high

cultivation in the district to address labour scarcity. Complete mechanization in paddy cultivation was demonstrated through frontline demonstration in Thovalai and Agastheeswaram blocks during 2012-13. Further, during 2013-14, Farmers field school was conducted at Perumselvavilai of Vembanoor block on mechanization in paddy. Ten courses were taught to group of farmers (25 farmers) from seed treatment to processing of paddy through mechanization manner. Complete paddy mechanization includes- tray nursery preparation (Plastic trays - 60 cm x 30 cm with seed rate of 20kg / ha), mechanical paddy transplanting (walk behind and drive type), power weeding (TNAU model two row weeder), mechanical harvesting using combined harvester, straw binder and paddy thresher.



**Power Weeder**



**Harvester**

wage rate prevailing in the state. To address this issue KVK Kanyakumari conducted frontline demonstrations and training programmes to promote SRI method. This initiative resulted in increase of yield (10-40%), and savings of water (25 to 30%) and nitrogen (25kg/ha) in rice cultivation.

KVK Kanyakumari has also initiated a programme on mechanization in paddy



**Tray nursery**



**Transplanter**

The mechanization in paddy cultivation resulted in the saving of 44 man days with a net profit of Rs.42900 and BCR of 2.31. As a result, farmers have adopted mechanical paddy transplanting in about 500-600 ha during *rabi* season. Two entrepreneurs were trained on mechanical transplanting and three on harvesting. These entrepreneurs are engaging youth for the operations. They are charging Rs.2800 for one acre transplanting and Rs.1400 for one acre mechanical harvesting using combined harvester. Each youth is being paid Rs.750 – 1000 per day as wages. Two farmers have purchased transplanters and trays to meet the demand of farmers. Farmers are availing mechanization service on contractual basis for tray preparation and planting. Straw binding machines are also employed to bind the straw after harvesting with combined harvesters. In Kanyakumari district around 75-85% of the paddy is being harvested through combined harvester at present.

#### **(viii). Integrated Pest Management reduces production cost of Paddy**

Shri. Subbaiyan of Thogaimalai block, Karur district is a progressive farmer who has been involved in cultivation of different crops such as paddy, sunflower, vegetables and fodder crops. During the last season he had grown paddy and harvested 4.7 t of paddy from one ha. The farmers in Thogaimalai area prefer to cultivate the super fine rice variety BPT 5204. However, this variety is susceptible to pests and diseases leading poor yield and high cost of cultivation. Shri. Subbaiyan underwent a training programme on Integrated Pest Management in Paddy conducted by KVK Karur at Thogaimalai. He adopted IPM in paddy under the technical guidance of the KVK. The major technology interventions

followed by him were use of *Pseudomonas fluorescens*, a bio-agent for seed treatment, seedling dip, soil application and foliar spray to prevent disease incidence, use of pheromone traps for monitoring stem borer occurrence, release of egg parasitoids - *Trichogramma chilonis* for leaf folder management and light trap for monitoring and management of insect pests. Further, adoption of the right package of technologies in the field included balanced fertilizer application at the recommended level that indirectly minimized the pest and disease incidence in his field. By adopting IPM, he has reduced the cost of cultivation by Rs.4000/ha per crop in paddy cultivation. The farmer has shared the benefits of IPM technology to over 100 farmers in his village and neighbouring villages.



A view of Shri. Subbaiyan's paddy field with IPM and interaction of KVK scientists and farmers in Karur district

### **(ix). Farming System on Inland Aquaculture in delta region**

Paddy is traditionally cultivated in delta region of Trichy district and it occupies about 72800 ha in the district. Many farmers find paddy cultivation no longer remunerative and are looking for opportunities to supplement their income through other allied activities. KVK, Trichy identified this need and began intervening through Inland aquaculture. The intervention consisted of digging ponds in the mid of the paddy fields and filling them with water to rear a composite culture of fish commonly used in the delta region viz., Rohu, Catla, Mirgal and Carp varieties with BCR 1.2:1. Since 1996, KVK has pursued extension approaches to disseminate inland aquaculture among paddy farmers.

In the year 2004, series of training programmes were arranged by the KVK with the sponsorship of National Fisheries Development Board. Nearly 150 farmers were trained in the process. The programme began to bear positive results from the year 2005 and nearly 60 farmers (35-40%) adopted inland aquaculture in their paddy fields. A series of frontline demonstrations on inland aquaculture made the farmers to undertake the inland aquaculture in a successful manner. The practice is very popular in Lalgudi and Pullampadi blocks. While the average income of a paddy farmer was Rs.15000 month/ha of land, with inland fish production, the income of the farmers has increased to Rs. 35000/month/ha, with BCR of 1.8:1. The KVK is emphasizing proper recycling of water by using the same for farming. Plankton growth is also enhanced in the ponds due to the paddy cultivation, which is ultimately used as feed for fish.

Shri. Fedrick Nickson, a farmer, who expanded his fish pond in 8.5 acres of paddy fields during 2013 and enhanced his farm income to 2.3 lakh per year. He supplied fingerlings to 105 fish ponds in and around in Trichy district. Inland aquaculture grower's federation of which Shri. Nickson, is the President has 25 enthusiastic aquaculturists as members. The group is going to be registered as a society. The group is mainly working on providing better marketing channel to farmers by avoiding middlemen.



**A view of inland aquaculture in delta region**

### **(x). Several mangoes in one stone – *Prosopis* pod flour as the cattle feed**

*Prosopis juliflora* commonly known as Mesquite tree, is a predominant weed infesting waste land and is found abundantly in dry lands of Tuticorin district. This tree is considered as a menace by the common peasants whereas it is a

multipurpose utility tree for charcoal producers, livestock growers and poor households who use it for the production of charcoal, fire wood utilize pod as livestock feed. Majority of landless poor and marginal dry land farmers of the district depend on charcoal production during the off season in the district. Livestock especially goats, sheep and cows feed on the pods during the dry summer months when no other feed is available. Though the fallen pods are directly eaten by the livestock during grazing, still a large quantity of the pods remains unused.

Considering this, KVK, Tuticorin discussed the issue with the people of this region and started promoting the use of ground pods as livestock feed from the year 2010-11. To start with the elder people who cannot do any hard labour were motivated to collect the pods at the cost of Rs.3/Kg and the same was purchased by the KVK. The pods were dried for 10-15 days to reduce the moisture and then grind in a mill located 75 km away from the village.

In a meeting of potential entrepreneurs at Vilathikulam the KVK discussed ways and means of promoting prosopis as livestock feed. Some of them were later trained in preparing cattle feed from Prosopis pods.



**A view of Prosopis in Tuticorin district**

The ground pod flour was then supplied to the livestock owners for trial purpose. After getting

encouraging feedback, it was decided to set up a mill at Vilathikulam by collaborating the pod collectors, entrepreneurs, livestock owners and



**Processed Prosopis feed material in Tuticorin district** traders. With the help of motivated entrepreneurs and pod collectors about 8 t pod was procured and one grinding mill was established at Vilathikulami during the month of September 2014. Within a month all the grind floor was sold out.

The pod was collected during the month of April and May by the landless laborers and elderly people. During this time each one of them was able to collect on an average 30 Kg of pods within 2-3 hours of work. For this they got Rs.150 (Rs 5 / Kg of seed collected) as wages. This venture has created an additional employment of 40 – 60 days for the pod collectors in a year. Besides, during the processing it provided additional employment opportunities for the mill workers for about 240 man days. Put together this venture resulted in creation of 240 men days of work at mill and 267 man days of work for the pod collectors during this year 2014 just by collection and processing of 8 t pods. It is expected that in the coming year the mill can procure about 50 t of pods and create an additional employment opportunity of 3166 men days of work to the people of this region.

By feeding on prosopis pod flour as a cheap replacement for pearl millet / wheat bran the



livestock owners could save up to Rs.5/Kg (cost of the pod flour in Rs.16 where as the cost of wheat bran / pearl millet in Rs.21/kg) thus it adds up the profit margin for the livestock farmers. Prosopis pod flour has the following multiple benefits:

- Reduction in the spread of Prosopis by open grazing by goats
- The Protein nourishment of cattle is ensured
- Ensures the availability of low cost feed – a boon to cattle owners
- Rural entrepreneurship generates income and employment to the rural poor

**3.1.13 Awards and Recognition**

**3.1.13.1 Best Zonal Krishi Vigyan Kendra Award 2012**

KVK Bidar was conferred with Best Zonal KVK award of ICAR for Zone VIII for the year 2013 for its outstanding achievements. The award was presented by Union Minister of State for Agriculture, Government of India during ICAR Directors and Vice-Chancellors of Agricultural Universities Conference on 15.5.2015 at New Delhi.



**Programme Coordinator, KVK Bidar receiving the Zonal Best KVK Award-2013 from Union Minister of State for Agriculture.**

During the period under report, KVK Namakkal received the Best Zonal NICRA KVK award for the year 2013-14 from Dr. A.K. Sikka, DDG (NRM), ICAR.



**Programme Coordinator, KVK Namakkal receiving NICRA Best Zonal KVK award on 29.11.2014**

Sri. Mohammed Idris Ahmed Quadri a farmer from Bagdal village in Bidar district of Karnataka received prestigious ICAR National award viz., Jagjivan Ram Abhinav Kisan Puruskar 2013 from Shri. Narendra Modi, Hon'ble Prime Minister of India



**Mr. Mohammed Idris Ahmed Quadri receiving Jagjivan Ram Abhinav Kisan Puraskar 2013 from by Hon'ble Prime Minister of India Shri. Narendra Modiji on 29-07-14 at New Delhi**



### 3.2 Agriculture Technology Information Centre (ATIC)

#### Visit of Farmer's/Extension personnel/ Stakeholders visits to ATICs :

During the period under report, a total of 12231 farmers, 1960 extension personnel and 14103 other stakeholders visited Agriculture Technology Information Centres (ATICs) in the zone. Altogether, 28294 persons visited the ATICs, out of which, 9944 visited for information and 18350 visited for technology products.

#### Communication with stakeholders:

A total of 18480 farmers contacted ATICs or were contacted by ATICs through various means of communication like phone calls from farmers (including Kisan Call Centre escalated calls), video shows, letters received and letters replied and participation in training. Among the different categories of information, varieties and hybrids (2810), agro-techniques (1763), animal husbandry and fisheries (1589) and disease management (1257) were the major areas.

#### Publications:

Under publications, 7599 books, 10701 technical bulletins, 14 CDs, 1413 DVDs and 78 video films were produced and provided to the ATIC visitors or those requested by mail. Totally, 2696 farmers and other stakeholders were benefited by these publications and documents.

#### Technology products and revenue generated:

Totally, an amount of Rs.10419160 was generated through production of various technology products/publications and services. Among different technology products provided, 2400 packets of seeds, 2427 number of seednuts and 2689 kg seeds were provided to visitors generating a revenue of Rs. 2148529. Bio control products, bio-agents, micro nutrient specials, healer-cum sealer, microbial products, fruit fly traps/lures etc. generated revenue of Rs. 6925741 publications, audio video cassettes and CDs earned Rs.330817.

### 3.3 Technological backstopping by Directorate of Extension

State Agricultural Universities play a crucial role for technology dissemination to farmers and other stakeholders through various extension related programmes. Providing technological backstopping through their Directorate of Extension for the KVKs is one among them. In Zone VIII, there are nine State

Agricultural Universities viz., University of Agricultural Sciences Bengaluru, University of Agricultural Sciences Dharwad, University of Agricultural Sciences Raichur, Karnataka Veterinary Animal and Fisheries Sciences University Bidar, University of Horticultural Sciences Bagalkot, University of Agricultural and Horticultural Sciences Shimoga, Kerala Agricultural University Thrissur, Tamil Nadu Agricultural University Coimbatore and Tamil Nadu Veterinary and Animal Sciences University Chennai, which are providing adequate technological support to the KVKs, which helps them to carry out their mandated activities more effectively.

The major means of technological backstopping provided by the Directorates of Extension include organization of workshops/seminars/training programmes for the KVK staff, participation in the Scientific Advisory Committee meetings, field days, workshop/ seminar, technology week, training programmes, discussion with KVK officials, visit to farmers plots where On Farm Trials/Frontline Demonstrations are being conducted and, facilitating technological inputs like seeds, planting materials, bio-products, livestock breed, fingerlings, livestock products.

During the reporting period, Directors of Extension and their officials participated in 41 Scientific Advisory Committee meetings, 55 field days, 45 workshops/seminars, 30 training programmes including off campus programmes and 21 Technology Weeks. In addition they have attended in 35 other programmes including group discussion with KVK officials, farmers meet, animal health camp, inauguration of farmers group /society in villages, Krishi Mela etc.

Directorates of Extension monitored the activities of KVKs through various programmes including workshops/review meetings, action plan meetings, sensitization meetings, regional committee meeting, scientific workers conference, crop specific awareness programmes etc. In addition, they made field visits to 65 plots where on farm trials were conducted, 123 plots of frontline demonstration and participated in 61 training



programmes 53 extension activities and 16 Farmers Field Schools programmes were conducted by the KVKs. Further they have also assisted the KVKs for preparing 17 documents on success stories / case studies.

In order to provide technological backstopping on latest technologies in agriculture and its allied sectors, the Directorates organized 37 training programmes in which 316 KVK staff from 80 KVKs participated. The thematic areas covering these training programmes include agri-business management, apiculture, climate change effects and its management, communication skill for effective extension management, Integrated Farming Systems, hi-tech agriculture, Information and Communication Technology, organic farming technologies, participatory watershed management, precision farming technologies, processing and value addition, Protection of Plant Varieties and Farmers Rights Awareness, database management, soil and water conservation, promotion of small livestock, dairy management techniques, disease management in livestock and poultry etc.

Directorates of Extension facilitated accessing of quality technology products to the KVKs such as seeds of high yielding varieties and hybrids, planting materials, livestock and poultry breeds etc. During the year, 146.35 quintals of seeds were provided to 29 KVKs. In addition, 0.19 lakh of planting materials to 16 KVKs, 57.80 quintals of bio-products to 20 KVKs, 29 livestock to 8 KVKs, 8600 poultry birds to 7 KVKs and 3.13 quintals of nutrient mixture for two KVKs were made available.

### 3.4 Special Programmes

#### 3.4.1 Pulse crop demonstrations under technology demonstration for harnessing pulse production

A total of 419 demonstrations on major pulse crops such as pigeonpea, blackgram, greengram, and chickpea covering an area of 171.20 ha were implemented in the NFSM implementing districts of Karnataka and Tamil Nadu states as a special drive under technology demonstration for harnessing pulse production in the country during 2014-15.

#### Kharif 2014-15

A total of 193 demonstrations on pulse crops namely pigeonpea (104), blackgram (22), and green gram (67) covering an area of 81 ha were implemented in the pulse growing districts of Karnataka state under technology demonstration for harnessing pulse production in the country during kharif 2014 (Table-103).

**Pigeonpea:** Demonstrations on Integrated Crop Management practices (69) in TS-3R, BSMR-736, BRG-2 and BRG-4 varieties, variety Introduction (10) and Integrated Disease Management (20) covering an area of 42 ha were conducted in 6 major pigeonpea growing districts of Karnataka state. The results indicated that average yield increase ranged from 1.14% to 118.67% under rainfed situation recording an average yield of 14.16 q/ha as against 10.22 q/ha in farmers' practice. The ICM demonstration gave average yield of 17.45 q/ha as compared to 12.26 q/ha under farmers' practice. The BCR recorded under demonstrations was higher in all technologies demonstrated as against farmers' practice.

**Blackgram:** Demonstrations on integrated crop management practices were conducted in Bidar, Kalaburagi and Dharwad districts of Karnataka with DU-1 and TNAU-I varieties covering an area of 12 ha under rainfed condition during kharif 2014. The average yield increase was 14.11 % in demonstrations with an average yield of 8.29 q/ha as against 7.26 q/ha under farmers' practice. The BCR recorded under demonstrations was 2.38 as against 2.20 under farmers' practice.

**Greengram:** 67 demonstrations on integrated pest and disease management, integrated crop management practices and new varietal introduction (BGS-9) in green gram covering an area of 27 ha under rainfed situation were undertaken in six districts of Karnataka state. The average yield increase was 25 % under Integrated Pest and Disease Management, 17.76% under Integrated Crop Management and 35.92% under variety introduction with an average yield of 7.98 q/ha as against 6.45 q/ha under farmers' practice. The BCR recorded under demonstrations was 3.11 as against 2.66 under farmers' practice.



**Table:103 Effect of frontline demonstrations on improved technologies in pulses production during Kharif 2014-15.**

Thematic Area	District	Farming Situation	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C	
						Demo	Check		Demo	Check
<b>Karnataka</b>		<b>Pigeonpea</b>								
Integrated Crop Management	Kalaburagi	Irrigated	BSMR 736	10	4	26.78	15.57	72.00	3.44	2.60
	Belagavi	Rainfed	TS-3R	10	4	17.7	14.32	23.60	3.89	3.34
	Bidar	Rainfed	BSMR-736	10	4	24.6	11.25	118.67	4.87	3.00
	Tumkur	Rainfed	BRG-4	12	4	10.67	10.55	1.14	3.42	3.19
	Chitradurga	Rainfed	BRG -2	15	6	17.6	14.1	24.82	5.05	4.37
	Kalaburagi	Rainfed	TS-3R	12	5	9.3	7.92	17.42	3.46	3.08
				<b>69</b>	<b>27</b>	<b>17.45</b>	<b>12.26</b>	<b>40.65</b>	<b>4.08</b>	<b>3.34</b>
Integrated Disease Management	Bidar	Rainfed	BSMR-736	25	10	7.49	5.9	26.95	1.85	1.46
	Tumkur	Rainfed	BRG-4	10	5	9.74	7.83	24.39	2.26	1.81
				<b>104</b>	<b>42</b>	<b>14.16</b>	<b>10.22</b>	<b>35.46</b>	<b>3.33</b>	<b>2.71</b>
<b>Karnataka</b>		<b>Blackgram</b>								
Integrated Crop Management	Bidar	Rainfed	TAU-1	5	5	8.42	7.28	15.66	1.65	1.59
	Kalaburagi	Rainfed	DU-1	12	5	8.71	7.6	14.61	3.26	2.92
	Dharwad	Rainfed	DU-1	5	2	6.9	6.33	9.00	2.01	1.90
				<b>22</b>	<b>12</b>	<b>8.29</b>	<b>7.26</b>	<b>14.11</b>	<b>2.38</b>	<b>2.20</b>
<b>Karnataka</b>		<b>Greengram</b>								
Integrated Pest & Disease Management	Chitradurga	Rainfed	BGS-9	15	6	4.26	3.42	24.56	2.11	1.83
	Belagavi	Rainfed	DGGV-2	10	4	11.3	8.4	34.52	3.41	2.77
				<b>25</b>	<b>10</b>	<b>7.08</b>	<b>5.41</b>	<b>25</b>	<b>2.63</b>	<b>2.45</b>
Integrated Crop Management	Bidar	Rainfed	BGS-9	10	4	10.04	8.06	24.57	3.34	3.22
	Dharwad	Rainfed	DGGV-2	5	2	7.21	6.42	12.31	2.65	2.58
	Kalaburagi	Rainfed	BGS-9	5	2	10.69	8.89	20.25	3.12	2.27
	Kalaburagi	Rainfed	BGS-9	12	5	9.25	8.15	13.50	3.86	3.49
				<b>32</b>	<b>13</b>	<b>9.40</b>	<b>7.97</b>	<b>17.76</b>	<b>3.40</b>	<b>3.08</b>
Variety Introduction	Koppal	Rainfed	BGS-9	10	4	5.6	4.12	35.92	3.36	2.45
					<b>67</b>	<b>27</b>	<b>7.98</b>	<b>6.45</b>	<b>24.44</b>	<b>3.11</b>
<b>Kharif total</b>				<b>193</b>	<b>81</b>					

### Rabi pulses 2014-15

A total of 226 demonstrations on pulse crops namely chickpea (89), green gram (60) and black gram (87) covering an area of 90.2 ha were implemented in the pulse growing districts of Karnataka and Tamil Nadu states under technology demonstration for harnessing pulse production in the country during rabi 2014-15 (Table 104).

**Chickpea:** 89 demonstrations on integrated crop management practices, Integrated Disease Management and variety introduction (JG-11



**Farmers feedback on performance of Jaki-9218 and JG-11 varieties of chickpea**

and JG-14) were demonstrated covering an area of 35 ha in 8 districts of Karnataka state. The average yield increase was 24.43 % under technology demonstration over farmers' practice. An average yield of 13.62 q/ha was recorded under demonstrations as compared to 10.96 q/ha under farmers' practice. The demonstration on Integrated Crop Management gave an average yield of 13.93q/ha as against 11.38 q/ha recording an increase of 22.60% over farmers' practice. The BCR recorded under demonstrations was higher in all technologies as compared to BCR recorded under farmers' practice.



**Green gram demonstration under Special Pulses programme at Tuticorin district**

**Blackgram:** 77 demonstrations on farm mechanization, Integrated Crop Management practices and new varieties introduction (VBN-6, MDU-1) covering an area of 27.2 ha were conducted in 7 districts of Tamil Nadu state. The average yield increase in black gram was 12.04% over farmers practice. The average yield recorded under technology demonstration was 8.31 q/ha as compared to 7.27 q/ha under farmers' practice. The variety MDU-1 at Vellore district did not perform well as compared to farmers' practice as the variety recorded 20.69% lower yield as compared to local check. The BCR was higher in rest of the technologies demonstration as compared to farmers' practice.

**Greengram:** 60 demonstrations on integrated crop management practices and new varieties introduction (Co (Gg)-7 and Co (Gg)-8) in green gram covering an area of 28 ha were conducted in 5 districts of Tamil Nadu state. The average yield increase due to technology demonstration was 25.74% over farmers' practice. The yield recorded under Integrated Crop Management was 7.01 q/ha as against



5.92 q/ha under farmers' practice, whereas under new variety demonstration it was 8.01 q/ha against 6.55 q/ha under check variety. The demonstration on integrated disease management gave an average yield of 18.28

q/ha as against only 10.27 q/ha there by recording 77.99% increase in yield. BCR recorded under demonstrations was higher as compared to BCR achieved with farmers' practice in both the states.

**Table: 104 Effect of frontline demonstrations on improved technologies in pulses production during Rabi 2014-15.**

Thematic Area	District	Farming Situation	Name of Variety	No. of farmers	Area (ha)	Yield (q/ha)		% increase over check	B:C	
						Demo	Check		Demo	Check
<b>Karnataka</b>		<b>Chickpea</b>								
Integrated Crop Management	Belgaum	Irrigated	GJ-11	10	4	20.52	16.93	21.20	4.10	3.76
	Bidar	Rainfed	JG-11	5	2	10	7.8	28.21	1.71	1.50
	Dharwad	Rainfed	JG-11	5	2	16.4	13.62	20.41	2.76	2.37
	Gadag	Rainfed	JAKI-9218	10	4	12.45	9.88	26.01	2.37	1.93
	Tumkur	Rainfed	JG- 11	12	4	9.5	8.25	15.15	3.21	3.40
	Chitradurga	Rainfed	JG -11	15	6	13.42	10.48	28.05	3.86	3.21
	Gulbarga	Rainfed	GBM	12	5	14.58	12.25	19.02	4.45	3.78
				<b>69</b>	<b>27</b>	<b>13.93</b>	<b>11.38</b>	<b>22.60</b>	<b>3.45</b>	<b>3.05</b>
Integrated Disease Management	Bidar	Rainfed	Ujjawal	5	2	18.28	10.27	77.99	2.46	2.52
Varietal Evaluation	Bidar	Rainfed	JG-14	5	2	10.69	10.13	5.53	1.82	1.85
Variety Introduction	Koppal	Rainfed	JG-11	10	4	10.63	8.9	19.44	3.94	2.45
				<b>89</b>	<b>35</b>	<b>13.62</b>	<b>10.96</b>	<b>24.43</b>	<b>3.35</b>	<b>2.88</b>
<b>Tamil Nadu</b>		<b>Blackgram</b>								
Farm Mechanization	Virudhunagar	Rainfed	MDU1	10	4	7.91	6.99	13.16	2.33	2.01
Integrated Crop Management	Thiruvannamalai	Irrigated	VBN6	10	4	8.96	6.91	29.67	2.27	2.04
Variety Introduction	Nagapattinam	Irrigated	VBN 6	10	2	5.5	3.9	41.03	2.60	1.48
	Thiruvallur	Irrigated	MDU 1	2	0.2	9.44	7.57	24.70	2.97	2.29
	Vellore	Rainfed	MDU 1	20	8	5.01	6.32	-20.69	1.86	2.01
	Villupuram	Irrigated	MDU 1	15	5	16.32	12.48	30.77	3.37	2.60
	Tuticorin	Rainfed	VBN – (Bg) – 6	10	4	6.01	5.0	20.24	1.54	1.39
				<b>77</b>	<b>27.2</b>	<b>8.31</b>	<b>7.27</b>	<b>12.04</b>	<b>2.28</b>	<b>1.99</b>
<b>Tamil Nadu</b>		<b>Greengram</b>								
Integrated Crop Management	Villupuram	Irrigated	CO8	10	2	1.039	0.697	49.07	2.61	2.01
	Virudhunagar	Rainfed	CO8	20	8	8.5	7.22	17.73	2.48	2.19
				<b>30</b>	<b>10</b>	<b>7.01</b>	<b>5.92</b>	<b>24.00</b>	<b>2.50</b>	<b>2.15</b>
Variety Introduction	Nagapattinam	Irrigated	Co8	10	4	5.5	4	37.50	2.40	2.08
	Thiruvallur	Irrigated	CO (Gg) 8	10	10	11.24	8.9	26.29	4.93	3.83
	Tuticorin	Rainfed	Co (Gg) 7	10	4	5.59	4.78	16.95	3.24	2.32
				<b>30</b>	<b>18</b>	<b>8.71</b>	<b>6.90</b>	<b>26.71</b>	<b>3.99</b>	<b>3.11</b>
				<b>60</b>	<b>28</b>	<b>8.10</b>	<b>6.55</b>	<b>25.74</b>	<b>3.46</b>	<b>2.77</b>
<b>Rabi Total</b>				<b>226</b>	<b>90.2</b>					
<b>Grand Total</b>				<b>419</b>	<b>171.2</b>					

### 3.4.2 National Innovations on Climate Resilient Agriculture (NICRA)

The scheme on National Innovations on Climate Resilient Agriculture (NICRA) is being implemented in the country to develop improved technologies through short term and long term research as well as to demonstrate the existing technologies on farmers' fields for enhancing climate resilience. In Zone-VIII, it is being implemented in nine most vulnerable districts namely, Belagavi (drought/heat), Davanagere (drought/heat), Chikkaballapura (drought/heat) and Tumkur (drought) in Karnataka, Namakkal (drought), Villupuram (drought/flood/cyclone), Ramanathapuram (drought/flood/cyclone/salinity) and Tiruvarur (drought/flood a/salinity) in Tamil Nadu and Alleppey (water inundation/drainage) in Kerala. The

interventions being implemented are based on four modules, i.e. (1) Natural resources management, (2) Crop production, (3) Livestock and fisheries and (4) Institutional interventions (5) Capacity building (6) Extension activities.

#### **Module I: Natural Resources Management**

This module consists of interventions related to *in-situ* moisture conservation, water harvesting and recycling for supplemental irrigation, improved drainage in flood prone areas, conservation tillage where appropriate, artificial ground water recharge and water saving irrigation methods. A total of 505 demonstrations covering an area of 414 ha has been treated with NRM related treatments covering 1473 farmers in 8 villages under NICRA. The details are presented in Table 105.

**Table 105: Details of NRM activities undertaken under NICRA**

Interventions	No of KVKs involved	No. of Demonstrations	Area (ha)	No. of farmers benefitted
<b>In-situ moisture conservation practices</b>				
Trench cum bunding	4	-	220.6	284
Levelling and bunding	1	9	4	9
Broad bed and furrow	1	20	2	20
Strengthening of existing bund	1	23	7146 m <sup>3</sup>	23
Mulching	2	47	6.4	37
		99	233	373
<b>Ground water recharge</b>				
Open well recharge	1	1	-	1
Bore well recharge	1	1	Area 133 m <sup>3</sup>	1
Heightening of check dam	1	2	2 No.	5
Construction of water storage pit	1	1	1	44
Desilting of Nalas	1	3	3086.38 m <sup>3</sup>	127
Desilting of existing tanks	1	2	3715 m <sup>3</sup>	72 farmers applied silt to 38 ha
Channel cleaning	1	1	300 m <sup>3</sup>	Community work
Renovation of defunct check dams	2	2	14975 m <sup>3</sup>	32
		<b>13</b>		<b>282</b>

(Contd...)



Interventions	No of KVKs involved	No. of Demonstrations	Area (ha)	No. of farmers benefitted
<b>Water harvesting and recycling for supplemental irrigation</b>				
Farm pond	3	25		70
Construction of Water storage tanks	1	2	2 (45 X 16 X 1.20 m, 75 X 30 X 1 m)	2
Community pond	1	1	(133 L x 97 B x 18 D) (feet)	126
Deepening, desilting and bund formation of community pond	1	1	(119 L x 87 B x 12 D) (ft)	34
Plastic lining of farm pond	1	1	1 No.	1
Rejuvenation of farm pond	1	4	4 Nos.	8
Renovation of old Minor irrigation tank	1	1	23	1
Temporary water storage pond	1	3	(160 L x 72 B x 12 D) (feet)	3
		38		245
<b>Other technologies</b>				
Compost making	2	13		13
Green manuring	2	15	12	15
Fodder grass on farm bunds	2	49	6	49
Micro irrigation systems	3	60	40.28	60
Planting forest trees	2	2	1850	60+Community
Tree based farming system	1	-	15	50
Tree planting in farm bunds	1	5	2	5
Recycling of organic residues for energy generation and crop production using biogas units	1	16		54
Soil test based nutrient application	2	100	61	100
Vermi-compost making	3	28		28
Large scale composting of aquatic weeds	1	13	45	100
Waste weirs	1	52	104 m3	37
Bio-digester	1	2	-	2
		<b>355</b>		<b>573</b>
<b>Grand Total</b>		<b>505</b>	<b>414 ha</b>	<b>1473</b>

### Module II: Crop Production

This module consists of introducing drought/temperature tolerant varieties, advancements of planting dates, water saving paddy cultivation methods (SRI, aerobic, direct seeding), frost management in crops, community nurseries for delayed monsoon and location specific

intercropping system. A total of 1299 farmers demonstrated large number of technologies in an area of 543.5 ha in eight villages. The increase in yield under technology demonstration ranged from 1.71 % to 193 %. District wise details are presented in Table 106.



**Table 106: Effect of crop production technologies on yield and income.**

Interventions	Name of district	No. of farmers	Area (ha)	Yield (q/ha)		% increase in yield	B.C ratio	
				Demo	Farmers' practice		Demo	Farmer's practice
<b>Advancement of sowing</b>								
Fodder Sorghum CoFs 29 (27. 8.2014)	Namakkal	11	5	84	45	86	3.5	1.8
Groundnut Co 6 (22.8.2014)	Namakkal	14	2.6	17	14.6	16	3.1	2.4
Small onion Co-5 (5. 6.2014)	Namakkal	82	112	163.2	140	16.5	3.5	2.9
<b>Drought tolerant varieties</b>								
Castor (YRCH-1)	Namakkal	2	0.4	171.5	125	38	4.5	1.8
Fodder Sorghum (CoFs 29)	Namakkal	11	5	84	45	86	3.5	1.8
Groundnut Variety (Co-6)	Namakkal	14	2.6	18.5	14.5	27.5	3.4	2.7
Groundnut – TMV 13	Villupuram	12	3	31	22	29	3.79	2.4
Groundnut (ICGV91114)	Tumkur	3	1	17.23	14.5	18.82	1.7	1.46
Groundnut (ICGV91114)	Davangere	2	1	10.1	9.2	9.8	2.1	1.9
Dolichos (Arka Amogh)	Tumkur	15	2	3.2	2.7	9.8	2.9	2.7
Ragi (KMR-204)	Chickballapura	25	10	7.5	6	25	2.04	0.07
Bengalgram (JG 11)	Belgavi	33	7.8	15.63	11.2	39.55	2.45	1.97
Wheat (DWR 2006)	Belgavi	30	11.8	16.25	11.86	37.01	1.7	1.38
Sorghum APK - 1	Namakkal	2	0.8	24	-	-	-	-
Hedge Lucerne	Namakkal	4	0.4	64	-	-	-	-
<b>Short duration varieties</b>								
Avare (HA-4)	Davangere	18	7.2	18.5	14.7	25.85	2.25	1.91
Blackgram (Co 6)	Namakkal	6	3	8.15	7.1	16	3	2.6
Blackgram VBN 6	Villupuram	137	28	13.3	11.9	11.7	2.17	2.07
Green gram (VBN 3)	Namakkal	7	4	8.35	6.92	20.6	3.4	2.5
Paddy ADT ® 49	Villupuram	18	7.2	81.3	64.2	26.64	2.37	1.84
Redgram BRG2	Tumkur	32	3	13.3	10.2	10.7	2.79	2.59
Red gram BRG4	Tumkur	15	5	12.6	10.2	23.5	3.1	2.6
Paddy (Co®-51)	Ramanad	25	10	42	38	9.52	1.82	1.44
<b>Varietal evaluation</b>								
Aerobic Paddy MAS26	Tumkur	5	2	32.5	28.4	14.4	2.2	1.9
Bittergourd - Co 1	Villupuram	10	1	130	105	19.23	3.25	1.9
Groundnut – Co 6	Villupuram	5	1	16.5	13.2	20	2.26	1.85
Jasmine(Ramanathapuram Gundu)	Namakkal	12	1.6	37.5	32	17.1	2.5	2.1
Paddy ADT49	Namakkal	5	2	64.7	59.1	9.5	5.7	3.1
Snake gourd – Plr 2	Villupuram	10	1	280	160	42.9	2.3	1.7
Tomato Heemshona	Namakkal	2	0.6	440	150	193	2.5	2.1

(Contd...)



Interventions	Name of district	No. of farmers	Area (ha)	Yield (q/ha)		% increase in yield	B.C ratio	
				Demo	Farmer's practice		Demo	Farmer's practice
<b>Location specific intercroppings</b>								
Castor (YRCH-1) + Black gram Co 6	Namakkal	2	0.4	171.5	125	38	4.5	1.8
Groundnut +Redgram (8:2)	Chickballapura	28	35	8.16	52	63	1.02	0.72
Groundnut Variety (Co-6) + redgram Co(RG)7	Namakkal	14	2.6	17	14.6	16	3.1	2.4
Maize + redgram (BRG-2)-6:2	Davangere	102	42	84.5	44.5	89	2.55	1.66
Rabi Jowar + Bengalgram	Belagavi	40	16	28.75	24.5	17.35	2.81	1.96
Ragi +Redgram(10:2)	Chickballapura	7	5	13.51	8.88	65	2.04	1.07
Redgram – CoRG 7	Villupuram	50	20	2.4	1.5	37.5	3.7	1.57
Safflower + Bengalgram	Belagavi	10	4	27	22.8	18.42	87	2.62
<b>Contingency crop planning</b>								
Horse gram ( PHG-9)	Davangere	35	14	5.3	2.8	90	2.75	2.21
Navane	Tumkur	9	0.4	3.9	-	-	2.52	-
<b>Crop diversification</b>								
Annual Moringa(PKM -1)	Namakkal	5	1.5	162	-	-	-	-
Black gram (Co 6)	Namakkal	6	3	8.3	7.15	16	3	2.7
Cockscomb	Villupuram	10	1	74	55	25.6	3.5	2.3
Crossandra	Villupuram	10	2	18	13	27.8	3.2	1.9
Green gram -VBN 3	Namakkal	7	4	8.45	7.3	15.7	3.3	2.8
Greengram variety VBN-2 (Rice fallow)	Ramanathapuram	19	7.6	7.3	4	45	1.28	1.11
Jasmine	Villupuram	5	1	68	52	23	4.1	2.7
Paddy (ADT 49)	Namakkal	5	2	64.7	59.1	9.5	5.7	3.1
Red gram – Co(RG) 7- (Sole crop)	Villupuram	25	12	8	7.2	10	2.17	1.95
Rose	Villupuram	5	2	61	52	14	2.8	2.3
Seed Onion Co 5	Namakkal	5	2	166	163.2	1.71	3.6	3.5
Tuberose	Villupuram	25	5	66	48	27.3	2.7	1.8
<b>Seed production</b>								
Black gram (Co 6) vs. Local Variety	Namakkal	6	3	8.3	7.15	16	3	2.7
Fodder Sorghum (Co Fs 29) vs. Red sorghum	Namakkal	5	3	10.5	10	5	3.2	2
Green gram (VBN 3) vs. Local Variety	Namakkal	7	4	8.45	7.3	15.7	3.3	2.8
Groundnut Variety (Co-6) vs. Local Variety	Namakkal	14	2.6	18.5	14.5	27.5	3.4	2.7
Seed Onion Co 5 vs.Valayapatti Local Onion	Namakkal	5	2	166	163.2	1.71	3.9	3.5
<b>Low water requirement crops</b>								
Fodder Sorghum (Co Fs 29)	Namakkal	11	5	84	45	86	3.5	1.8
Hedge Lucerne	Namakkal	4	0.4	64	-	-	-	-
Nutrient management in Blackgram – VBN 3	Villupuram	84	25	12.8	7.5	43	2.3	1.44

(Contd...)



Interventions	Name of district	No. of farmers	Area (ha)	Yield (q/ha)		% increase in yield	B.C ratio	
				Demo	Farmer's practice		Demo	Farmer's practice
Bio agents & Vegetable micro nutrient mixture in small onion for nutrition management	Namakkal	50	20	166	163.2	1.71	3.9	3.5
Pest and disease management for Small Onion -- Maize barrier crop , Blue sticky trap	Namakkal	50	20	165	154	7.1	3.9	3.3
Resource conserving and eco friendly pest management practices in paddy	Alleppey	38	30	67.56	61.78	9.35	2.29	1.78
Poly bag cultivation of TC banana for overcoming flood during initial growth stages	Alleppey	20	10 cents each	41.53	33.65	23.42	1.57	1.25
Rain shelter cultivation of vegetables in flooded situations	Alleppey	5	35m <sup>2</sup> each	109.4 kg/un it	0	100	1.37	-
Bower system of vegetable cultivation in snakegourd	Namakkal	2	0.8	175	120	45	9.5	5.3
Bower system of vegetable cultivation (bittergourd)	Namakkal	2	0.8	142	98	44	7.2	4.9
Frost management -Using Mobile sprinkler for small onion	Namakkal	1	0.4	157.5	148.8	5.8	3.3	2.8
Water saving paddy cultivation methods (SRI)	Chickballapura	4	2	22	18	22	2.9	2.4
<b>Grand Total</b>		<b>1299</b>	<b>543.5</b>					

### Module III: Livestock and Fisheries

Use of community lands for fodder production during droughts/floods, improved fodder/feed storage methods, preventive vaccination, improved shelters for reducing heat stress in livestock, management of fish ponds/tanks during water scarcity and excess water etc. were

the activities carried out under this module. The KVK's of Zone VIII have introduced 302 number of improved breeds of animals besides vaccination for 4003 animals, 25000 fish fingerlings in 8 selected villages during drought period benefiting 888 farmers. The details are furnished in Table 107.



**Table : 107 Effect of demonstration on production of livestock and fisheries.**

Interventions	No of KVKs involved	No. of demonstrations	No. of animals/ birds treated
Animal health check up camp	6	112	2720
Artificial Insemination	1	1	114
Automatic drinker for dairy animals for reducing the heat stress during summer	1	5	10
Breed up gradation	5	14	302
Cattle insurance	1	2	2
Clean milk production	1	12	12
De-worming in livestock	4	196	3804
Foot and Mouth disease awareness camp	1	2	722
Housing of poultry in slatted floor to overcome flood	1	40	840
Improved shelters for reducing heat stress in poultry	1	13	632
Improved shelters for reducing heat stress in livestock	2	15	72
Intensive goat rearing in raised platform	1	10	84
Introduction of cow mat for stress management in dairy cow	1	20	30
Management of fish ponds/ tanks during water scarcity and excess water in village tank	2	4	25000 fingerlings
Mitigation of mineral deficiencies in animals	5	19	495
Model Dairy Farm Unit	1	5	10
Popularization of backyard poultry	3	27	1446
Preventive vaccination -livestock	4	383	4003
<b>Grand Total</b>		<b>880</b>	<b>15298+25000 fish seed</b>

**Feed and fodder production:** During the period under report, 35 units of azolla and 5 units of silage making were established and 238

demonstrations on improved fodder production were under taken in 8 villages during the year.

**Table : 108 Details of feed and fodder development programmes implemented under NICRA**

Interventions	No of KVKs	No. of Demonstrations	Area (ha)	Total Production (Quintal)
Azolla	6	35	4ft x 10ft/unit	104.03
Improved fodder production	5	238	342.16	10629
Silage making (using polybags)	2	5	5 unit	2
<b>Grand Total</b>		<b>278</b>		<b>10745.03</b>



**Module IV: Institutional Interventions**

The module consists of institutional interventions either by strengthening the existing ones or initiating new ones relating to seed bank, fodder bank, commodity groups, custom hiring centre, collective marketing group, introduction of weather index based insurance and climate literacy through a village weather station. The NICRA implementing centres established 5.42 ha area as fodder bank and 13 ha area as seed bank to meet the drought related situations. Six

commodity groups were formed in the villages for better coordination in technology adoption and marketing of produce. Under mechanization, 323.74 ha area has been cultivated through various implements availing under custom hiring by the villagers to carry out timely farm operations. Farmers were educated on weather aspects using data generated from village level weather stations and providing need based trainings to farmers on all the new technologies to facilitate their faster adoption (Table 109).

**Table 109: Details of Institutional Interventions implemented under NICRA**

Interventions	No of KVKs	No. of demonstrations/ activities	No. of farmers	Area (ha)
Climate literacy through a village level weather station (Agro Advisory services)	3	59	1569	-
Commodity groups	1	6	76	91.2
Community fodder production	1	1	17	2
Community nursery	2	2	28	7
Fodder bank	3	8	51	5.42
Mechanization through custom hiring for timely planting	6	105	613	323.74
Nutritional garden	1	34	34	0.15
Seed bank	3	14	27	13
To protect dry fodder from unseasonal rains (Tarpaulin sheet has distributed)	1	1	85	-
<b>Grand Total</b>		<b>230</b>	<b>2500</b>	

**Capacity building to farmers:** During the year, NICRA implementing KVKs conducted 109 training courses on various topics related to

climate resilient agriculture benefiting 3378 participating farmers including 1182 women farmers. The details are provided in Table 110.



**Table 110: Details of capacity building programmes organized under NICRA**

Title of the programme	No of KVKs	Number of trainings	Number of beneficiaries		
			Male	Female	Total
Awareness on climate change and its effect on agriculture	1	1	71	15	86
Clean and quality Milk production in dairy animals	1	1	-	56	56
Crop management	4	14	247	156	403
Enterprises for self employment	1	2	72	56	128
Farm implements and machineries	3	4	73	17	90
Fertilizer management in kharif crop	1	1	14	16	30
Fodder and feed management	6	9	130	93	223
Forest tree/ agro forestry plantation	1	1	36	13	49
Health and Sanitation	1	6	100	30	130
Improved production technology in tomato	1	1	20	-	20
Irrigation management	1	2	63	49	112
Live stock management	5	10	171	191	362
Management of horticultural crops	2	6	198	105	303
Micro irrigation systems	1	2	24	17	41
Natural resource management	5	10	195	79	274
NICRA awareness	2	5	130	50	180
Non violent direct action(NVDA)	1	1	12	15	27
Nursery production	1	2	13	11	24
Nutrient management in Maize and Redgram	1	2	45	5	50
Nutritional garden	1	2	12	22	34
Pest and disease management in maize	4	11	199	55	254
Resource conservation technology	1	1	32	24	56
Seed production	2	4	77	13	90
Seed treatment with bio fertilizers for Avare crop	1	1	48	-	48
Soil health management	4	5	150	60	210
Vegetable production	2	3	39	27	66
Water saving technology	1	1	12	7	19
Weed management in Maize	1	1	13	-	13
<b>Grand Total</b>		<b>109</b>	<b>2196</b>	<b>1182</b>	<b>3378</b>

**Extension Activities:** During the year, 362 extension activities were carried out by NICRA implementing KVKs in the villages to create awareness among the community about the climate related impacts on the agriculture and

related sector and measures need to be initiated to alleviate these adverse impacts. A total of 4307 beneficiaries participated in these programmes including 1460 women farmers (Table 111).

**Table 111: Details of extension activities implemented under NICRA**

Title of the programme	No of KVKs	Number of activities	Number of beneficiaries		
			Male	Female	Total
Agro-advisory service	3	124	138	49	187
Diagnostic visits	4	116	126	39	165
Exposure visit	7	12	206	107	313
Field day	8	12	490	205	695
Group dynamics ( Group discussion)	7	45	619	316	935
Health campaign	1	2	176	165	341
Kisan Mela	1	1	18	-	18
Method of demonstration	6	31	606	267	873
ICAR foundation day and Agriculture Quiz	3	3	258	36	294
Provided smart farmers card	1	1	96	4	100
Tree planting	1	1	19	18	37
TV programmes	1	2			
Women awareness /Awareness programmes	4	12	95	254	349
<b>Grand Total</b>		<b>362</b>	<b>2847</b>	<b>1460</b>	<b>4307</b>



**Demonstration on raised goat sheds for surviving floods at Alleppey district**



**Collection of aquatic weeds for composting using EM solution at Alleppey district**



**Intercropping system - Banana+ Avare+Cucumber at Davangere district**



**NRM works- Deepening of Rajagalve at Davangere district**



### 3.5. Research Project:

Behavioral Analysis of Farmers Decision Making on Agricultural Innovations

#### Sanctioning Authority

National Fund for Basic, Strategic and Frontier Application Research in Agriculture (NFBSFARA), changed as National Agricultural Science Fund (NASF) in XII Plan

#### PI and Lead Centre

Dr.M.J.Chandre Gowda, Principal Scientist (Ag. Extension), Zonal Project Directorate, Zone VIII, Hebbal, Bangalore 560024

#### CCPIs and Partner Institutes

- i. Dr.S.S.Dolli, Associate Professor, Department of Agricultural Extension Education, University of Agricultural Sciences, Dharwad-580005, Karnataka
- ii. Dr.M.V.Durga Prasad, Professor of Operations Research, Institute of Rural Management, Anand, P.O.box 60 Anand-388001, Gujarat
- iii. Mr. D. Saravanan, Assistant Director (Agriculture) Samuha, Vithalapur road, Kanakagiri, Gangavathi Taluk, Koppal District, Karnataka-583283

Date of sanction: 01.04.2014

Proposed Date of completion: 31.03.2016

Budget of the project: Rs.89.1085 lakh

#### Objectives

- i. Assess the farmers' decision making process in selection, adoption and continuation of innovations in different cropping systems of Karnataka and Gujarat to evolve innovation-decision process models.
- ii. Analyze the influence of push factors exerted from technology generation,

dissemination and facilitation systems and the pull factors emanated from technology utilization, marketing and consumption systems on the farmers' decision making in the two states.

- iii. Categorize farmers on the basis of adoption rate for specific innovations and determine their characteristics based on which recommend strategies to hasten innovation decision among late adopters

#### Summary of the results

Two villages each in Paddy, Cotton, Groundnut, Maize and Potato cropping systems in Karnataka (Koppal, Riachur, Dharwad, Haveri and Chikkaballapura districts) and Gujarat (Khed, Bhavnagar, Junagadh, Panchmahal and Banaskantha districts) have been identified and carried out Participatory Rural Appraisal (PRA). PRA data has been digitized along with GPS readings. Benchmark information has been collected for 3171 households in Karnataka and 2054 households in Gujarat. In each village about 30 to 50 farmers representing different strata of the farming community have been identified randomly to collect in-depth data related to the study. A total of 509 farmers in Karnataka and 414 farmers in Gujarat are serving as respondents for the study. Focused Group Discussions (FGD), structured/semi-structure interviews with individual farmers and key informants and participant observations are being used to collect data on various aspects.

Farmers decisions on choice of crops are influenced by, primarily income, within the season-soil suitability criteria. Cotton is spreading to traditional groundnut area in



Gujarat, due to better market prices. Farmers' decisions on choice of crop production technologies vary hugely. BPT 5204 in paddy, Kufri Jyothi and Pukhraj in Potato, Bt hybrids Jadoo and Ajit 155 in cotton, JL-24 and GG-20 in groundnut, and NK-6240 in Maize are important varieties. Pretilachlor and Anilophos in paddy, Metribuzin in potato, Imazethapyr in groundnut are important herbicides. Farmers use large number of pesticides and fungicides in irrigated situations, However, the usage is not scientific and driven by the advise of input dealers. In paddy, 39 insecticides/fungicides were used in one village in one season. In potato, 40 different chemicals were used as first spray by 30 farmers in one village. Very few farmers use micro-nutrients, limited to only zinc sulphate and boron. Sulphur application, without to their knowledge, as it is a part of N and P fertilizers.

Farmers' selection of innovations is based on attributes of the innovation meeting the local situations like market acceptability (paddy and groundnut) and good yield (cotton, maize and potato). In paddy, BPT-5204 has superior grain quality and has high acceptability in the market (by rice mills). Similarly, JL-24 and GG-20 groundnut varieties released in 1990s are still being cultivated by farmers for their acceptability by oil mills and high oil content. Added advantages are high yield and good fodder quality. Cotton, maize and potato varieties are chosen for high yield and less water requirement.

Based on the rate of acceptance by farmers, innovations have been categorized into (i) steady-stable, (ii) fast-stable, (iii) fast-declining and (iv) slow types. Paddy variety BPT-5204, groundnut varieties JL-24 and GG-20, potato varieties Kufri Jyothi and Pukhraj fall in steady-stable innovations for their long-life among the farmers. Problem-solving innovations like herbicides and drip-irrigation are accepted fast as well as remain for long-time. On the contrary, Bt Cotton hybrids and Maize hybrids are adopted fast but are also replaced swiftly. Micro-nutrients belong to slow and least adopted innovations.

Chemical pesticides have a peculiar pattern of acceptance by farmers. First-use mostly happens without any prior knowledge, forced by the input dealers or company representatives.

The time taken for adoption is as fast as one day and as long as one-two years. The rate at which innovations are introduced in the market has direct relation with adoption rate and continuance. Extension and marketing activities carried out by the chemicals companies are innovative as well as extensive, affecting farmers decision in all stages of Innovation Decision Process. But continued use depends on the performance of the chemical. Government programmes like subsidy have influenced acceptance of cost intensive innovations like sprinkler irrigation.



## Chapter 4

# HUMAN RESOURCES DEVELOPMENT

### 4.1. Orientation Programmes to the newly recruited KVK staff

Orientation Programmes are regularly conducted to the newly recruited KVK staff in order to sensitize them on various mandated activities of the KVK system. During 2014-15, Orientation Programme on mandated activities of the KVK was conducted in two Phases, in which 48 participants have attended. Phase I of the programme was organized at KVK Thrissur from 18<sup>th</sup> November 2014 to 21<sup>st</sup> November 2014. Twenty five KVK staff and four resource persons, Zonal Project Director and officials from Zonal Project Directorate participated. The major technical content of the programme included i) an overview of KVK system, ii) Participatory Rural Appraisal Techniques – Principles and research methodological aspects, iii) Technology Assessment and Refinement, iv) Frontline Demonstration iv) training programmes v) production and supply of technology products including Revolving Fund, vi) maintenance of KVK infrastructures and facilities, vii) extension activities, viii) process documentation ix) database management and x) project proposals. The second phase of the programme with the same course content was conducted during 3<sup>rd</sup> December 2014 to 6<sup>th</sup> December 2014 at KVK Bijapur.

### 4.2. Brainstorming Session on Creating and Sustaining Interest in Agriculture among the Youth The Hindu-NARS Initiative

Brainstorming Session on “Creating and

Sustaining Interest in Agriculture among the Youth The Hindu-NARS Initiative” was organized at CIBA Chennai on 25<sup>th</sup> October 2014. The programme was jointly organized by The Hindu, TANUVAS Chennai, CIBA Chennai and ICAR Zonal Project Directorate Zone VIII Bengaluru under the Chairmanship of Dr. S. Ayappan, Secretary DARE and Director General ICAR, New Delhi. The main objective of the programme was to evolve strategies to bring back rural youth to agriculture and its allied activities. In addition, the importance of agriculture and farming has to be inculcated among the school children.

The following are key ideas/suggestions that emerged out of the Brainstorming.

- 1) Linking agricultural production to proper markets so that the profitability is increased which in turn encourages youth to stay back and pursue agriculture as a profession.
- 2) Agriculture as a subject and a tool for experiential learning must be introduced at middle and higher secondary levels in schools.
- 3) Agriculture must be addressed holistically including horticulture, dairy, fisheries and animal husbandry etc.
- 4) Secondary agriculture must be duly emphasized to attract and retain youth in the sector.
- 5) Regular interaction must be carried out with school children to engage their interest in agriculture and allied sectors through quiz programmes, farm visits and



visit to Agricultural Research Institute.

- 6) The other suggestions from The Hindu School edition included inviting students to write about their experience in agriculture being practiced in their schools; institution of Hindu Scholarships enabling select children and students to travel to different research institutes and farmers fields and institution of a Venture Capital Fund to encourage students and young farmer research.
- 7) The Committee chaired by Dr.K.Ramasamy, Vice Chancellor, Tamil Nadu Agricultural University, Coimbatore in which Dr.Rameshwar Singh, Project Director, DKMA, Delhi; Shri M.J.Prabhu, Agricultural Correspondent, The Hindu; Dr.Sreenath Dixit, Zonal Project Director, Zonal Project Directorate – Zone VIII, Bengaluru as Members will draw an action plan based on the major decisions and execute them involving select KVKs of Zone VIII.

#### **4.3. Training Programme on Integrated Pest Management in Important Crops of Karnataka, Kerala, Tamil Nadu, Goa, Puducherry and Lakshadweep with special reference to bio-control**

The ICAR National Centre for Integrated Pest Management (NCIPM), New Delhi in coordination with ICAR Zonal Project Directorate, Zone VIII Bengaluru conducted two training programmes at National Bureau of Agricultural Insects Resources (NBAIR) during 23-25<sup>th</sup> July 2014 and at KVK Puducherry during

10-12<sup>th</sup> September 2014. A total of 60 participants mostly the Subject Matter Specialists Agricultural Entomology/Plant Pathology/Plant Protection participated in the programme.

Contents were tailored made to south Indian situations, which included i) sustainable crop protection through IPM strategies - perspectives for Southern India, ii) aspects of IPM in pigeonpea, chickpea, mungbean, urdbean, iii) role of Cultural Practices in IPM, iv) weed management and IPM, v) role of biological control and conservation of natural enemies in IPM technology (incl. EPN), vi) synthesis and validation of bio-intensive IPM technology in rice, vii) IPM in protected cultivation w.s.r.t. GAP, viii) mass production of microbial biocontrol agents for IPM programme, IX) IPM technology in coconut, arecanut and cashew, X) IPM in cotton, XI) Pollinator and IPM-an Interface, XII) development and validation of IPM technology in fruit crops, XIII) development and validation of IPM technology in vegetable crops (brinjal, tomato, cole crops, okra, cucurbits), XIV) e-pest surveillance and advisory –perspectives and IPM, XV) nematodes management in field and horticultural crops, XVI) IPM technology in banana, XVII) IPM in major spice crops, and XVIII) socio-economic considerations in implementation of IPM

#### **4.4. Workshop on Frontier Home Science Technologies for Knowledge and Economic Empowerment**

ICAR Zonal Project Directorate Zone VIII Bangalore and University of Agricultural Sciences Dharwad jointly organized a workshop for Subject Matter Specialists (Home Science) from the states of Karnataka, Kerala, Goa, Tamil



Nadu and Union Territory of Puducherry on 28<sup>th</sup> to 30<sup>th</sup> October 2014. The SMS (Home Science) from 57 KVKs participated in the workshop. The workshop was inaugurated on 28<sup>th</sup> October 2014 morning by Dr H S Vijayakumar Director of Education, UAS Dharwad in the presence of DrSreenath Dixit Zonal Project Director, ICAR Zonal Project Directorate, Zone VIII Bangalore and Dr.MB.Chetti, Director of Extension, Directorate of Extension, UAS Dharwad.

The major technical sessions include i) food processing and value addition, ii) drudgery reduction, income generation and women empowerment, iii) textile and apparel designing iv) child care and family management v) extension and communication management and vi) general assessment and demonstrations. Faculty from Rural Home Science College UAS Dharwad conducted the technical sessions.

On 29<sup>th</sup> October 2014, the participants were taken for a field visit in Gadag district, in which they were exposed to home science activities conducted by KVK Gadag including the exhibition, mini processing unit for production of home science products and KVK mall. They visited the sales centre of Mrs.Jayamma Benni where the rural women entrepreneur is selling value added products from minor millets, jaggery added products like holige etc. In addition they had exposure to production of value added products from sorghum and other millets at Padmavathi SHG Production Unit Hulkoti.

The following are the major recommendations / suggestions to be followed by all the KVKs.

- 1) The Subject Matter Specialist (Home Science) has an important role in the

overall KVK performance and hence needs adequate emphasis and encouragement for optimal output

- 2) SMS Home Science must identify the thematic areas under which they can propose OFT/FLD in consultation with experts
- 3) SMS Home Science may propose On Farm Trials in action plan proposed to address location specific issues.
- 4) SMS Home Science should propose more frontline demonstrations on successful technologies
- 5) Home Science technologies, released long ago but not reached to the farmers / stakeholders, can also be taken up be through FLD/ OFT
- 6) Programme Coordinators should facilitate Home Scientists to upscale successful home science technologies through demonstrations on convergence mode
- 7) KVK Home Scientist may encourage SHGs for preparation of project proposals on successful technologies on EDP mode
- 8) Home Scientists may define their roles in demonstration of technologies like backyard poultry, nutritional gardening, storage and preservation technologies, production and supply of bio-products, seed and planting materials, health and hygiene, home medicine etc.

#### 4.5. Participatory Impact Monitoring and Assessment

ICAR Zonal Project Directorate, Zone VIII Bengaluru in coordination with KVK Erode and KVK Mysore conducted training programme in

Participatory Impact Monitoring and Assessment (PIMA) in two batches, at KVK Erode from 19<sup>th</sup> to 24<sup>th</sup> November 2014 and at KVK Mysore from 1<sup>st</sup> to 6<sup>th</sup> December 2014. A total of 50 participants attended.

The course content included i) concept of “participation”, ii) introduction to PIMA: What & Why, iii) Logical Framework Analysis—a brief introduction, iv) steps in PIMA, v) methods and

tools that can be used in PIMA, vi) PIMA in the context of KVK activities, vii) selection of programmes for application of PIMA steps, and allocation of programmes to sub-groups, viii) selection of indicators for impact analysis through field work and defining the selected impacts in specific terms, and ix) research methodological aspects of PIMA



PRA exercises are in progress in Erode district

#### 4.6.. Training for newly recruited Programme Coordinators

Newly recruited Programme Coordinators from Zone VIII have undergone training in three Phases, Phase I at NAARM Hyderabad from

10-24<sup>th</sup> November 2014, Phase II at the Best KVKs in the country (27<sup>th</sup> November to 6<sup>th</sup> December) and Phase III at ICAR Zonal Project Directorate Zone VIII Bengaluru (15<sup>th</sup> to 19<sup>th</sup> December 2014).



In Phase III conducted at ICAR Zonal Project Directorate Zone VIII Bengaluru, nine Programme Coordinators from KVKs Kodagu, Tumkur A, Tuticorin, Thiruvannamalai, Belgaum-A, Vellore, Madurai, South Goa and Bagalkot participated in the Programme. The major course content for Phase III include i) Zonal Project Directorate Zone VIII – an overview, ii) presentation of action plan for the KVK based on learning from Phases I and II, iii) preparation of vision document – perspective plan for KVK, iv) developing data base of district agriculture and compilation of inventory of technologies and extension service and input providers, preparation of EFC document at KVK level and submission of reports and replying to parliament questions, v) application of relevant innovative approaches of agricultural extension in KVKs to enhance its relevancy, efficiency and outreach, vi) interface and convergence with ATMA, line departments, NGOs and other stakeholders, vii) Technological Backstopping by Directorate of Extension , viii) Action taken on the recommendations of SAC, zonal workshops, QRT, National KVK Conference and Regional

Committee meetings/interfaces etc and monitoring, review and evaluation through SAC meetings, zonal workshops , review meetings etc; replying to RTI queries etc., ix) procedures for development of infrastructure and their utilization, as well as repairs and maintenance of equipments, tools, implements, vehicles and other infrastructure in KVKs and resource mobilization, x) preparation of UC and AUC and upkeep of administrative, financial and scientific records and MOU of ICAR with host organizations; replying to audit paras, and xi) writing of field extension and action /adaptive research project proposals; conducting and documenting case studies and success stories and writing of popular and scientific articles; conducting and documenting impact of KVK activities with examples of impact indicators and analysis of data generated under KVK programmes. In addition they have visited University of Agricultural Sciences Bengaluru, KVKs Tumkur A and Chickaballapura and learnt about the technology delivery mechanisms adopted by these KVKs for successful implementation of technology interventions.



## Chapter 5

# Publications

### 5.1 Papers Presented in International/ National Conferences

- 1) C.V.Sairam, B.T.Rayudu, S.Prabhu Kumar, Sreenath Dixit, M.J.Chandre Gowda, D.V.Srinivasa Reddy, R.S.Ramamurthy and Mallikarjun B.Hanji (2014), “*Monitoring and Evaluation of Agricultural Extension Projects*”, Invited Paper presented in the Brainstorming session on Monitoring and Evaluation on Agricultural Research, Education and Extension for Development organised by us on 28th June 2014 at ISEC Bangalore
- 2) C V Sairam, B T Rayudu, D V S Reddy, M J Chandre Gowda, Sreenath Dixit, R S Ramamurthy and Mallikarjun B Hanji, “*Management Strategies for Sustaining Crop Production and Farm Income with Changing Climate – Experiences of Krishi Vigyan Kendras*”, Paper presented in National Seminar on Climate Change and Agrarian Economy at UAS Dharwad during 22-23 January 2015

### 5.2. Research Articles

1. Gopinath, K.A., Ch Srinivasarao, Ravindra Chari, G., Sreenath Dixit, Osman, M., Raju, B.M.K., Ramana, D.B.V., Saroja, D.G.M., Venkatesh, G., and Maheswari, M. (2014) Improving the Productivity of Rainfed Farming Systems

- of Small and Marginal Farmers in Adilabad District, Telangana. *Indian Journal of Dryland Agric. Res. & Dev.*, 29(1): 52-56
2. Venkatachalam M., B.S.Hansra, M.J.Chandre Gowda and P.K.Jain, 2014. An insight into Farmers Perceptions and Adoption Behaviour on Bt Cotton Cultivation. *Journal of Community Mobilization and Sustainable Development*, 9(1):44-47.
3. Venkatachalam M., B.S.Hansra, M.J.Chandre Gowda and A.Arunachalam, 2014. Adoption behavior and constraints faced by Bt cotton growers in India. *International Journal of Agricultural Sciences*, 5(1): 115-122.
4. M.J.Chandre Gowda and Sreenath Dixit, 2015. “Influence of farmers educational level on comprehending, acting-upon and sharing of agro advisories”. Accepted for publication in *Journal of Agriculture and Rural Development in the Tropics and Subtropics*.
5. Arunachalam,V, Rajesh M.K, Jerard, B.A. Jayabose, C and Sairam, C.V (2014) Characterization of a spicata mutant of coconut palm in India. *Journal of Plantation Crops*, 42(1):417-424.
6. Moolchand Singh and C V Sairam (2015),



“Evaluation of Integrated Weed Management Practices in rainfed cotton”. *International Journal of Tropical Agriculture*, 33(1), pp.51-53.

### 5.3. Book / Chapters

1. Srinivasarao, Ch., Venkateswarlu, B., Y. Sudha Rani, Singh, A.K., and Dixit, S. (2014). "Soil Carbon Sequestration with Improved Soil Management in Three Tribal Villages in India". Congress in Soil Science 2014, pp 239-247
2. Sudhakar, N., Chahal, V.P., Sreenath Dixit. (Eds.) 2014 Souvenir. *Toward Climate Resilient Agriculture, KVKs' Experiences from Maharashtra*. Annual Conference of AU Vice Chancellors, ICAR Directors and Progressive Farmers. January 17-20, 2014, Baramati, Pune, Maharashtra. Pp 92.

### 5.4. Technical Bulletins

1. Prasad, Y.G., Osman, M., Singh, S.S., Manoranjan Kumar, Singh, K.M., Dixit, S., Singh, R.D., Singh, A.K., Maheshwari, M., Bhatt, B.T., Venkateswaralu, B., and Sikka, A.K. 2014. "Contingency Measures for Deficit

*Rainfall Districts in South Bihar. Central Research Institute for Dryland Agriculture", Hyderabad, India. P.19.*

2. Prasad, Y.G., Maheshwari, M., Dixit, S., Ch Srinivasarao, Sikka, A.K., Venkateswaralu, B., Sudhakar, N., Prabhu Kumar, S., Singh, A.K., Gogoi, A.K., Singh, A.K., Singh, Y.V., Mishra, A. 2014. "Smart Practices & Technologies for Climate Resilient Agriculture". Central Research Institute for Dryland Agriculture, Hyderabad, India. P.76.

### 5.5. Reports

Annual Report 2013-14, ICAR Zonal Project Directorate Zone VIII, Published by Sreenath Dixit, (Eds: M.J.Chandre Gowda, C.V.Sairam, D.V.S.Reddy, B.T.Rayudu, R.S.Ramamurthy, Mallikarjun B.Hanji and J.Mathew), ICAR Zonal Project Directorate, Zone VIII, Bangalore, India.

### 5.6. Publications by KVKs

KVK staff have published 200 research papers, 95 technical bulletins and 601 popular articles; KVKs have documented 1018 extension literature, 1980 news paper coverage, 50 books, 82 CD/DVD and 165 news letters on various technological aspects of agriculture and its allied enterprises.



## Chapter 6

### Workshops, Meetings, Conferences

During the period under report, the staff of Zonal Project Directorate-Zone VIII involved in organization/participation in various workshops, meetings and conferences as listed here under:

#### 6.1 Organization of Meetings / Workshops

- Review Cum Action plan Workshop for NICRA KVKs of Zone-VIII at ZPD-VIII, Bengaluru on 22<sup>nd</sup> April 2014.
- Zonal Annual Review Workshop of KVKs in Zone VIII at CMFRI, Kochi during 5-8 May, 2014.
- Brainstorming Session on Farmer Producers Organizations (FPOs) and Partnership Approaches in Krishi Vigyan Kendras, at Agriculture college, Madurai on 25 July, 2014
- Training Programme on Integrated Pest Management in Important Crops of Karnataka, Kerala, Tamil Nadu, Goa, Puducherry and Lakshadweep with special reference to bio-control at NBAIR, Bangalore during 23-25<sup>th</sup> July 2014 and KVK, Paducherry during 10-12<sup>th</sup> September 2014.
- Brainstorming Session on Creating and Sustaining Interest in Agriculture among the Youth The Hindu-NARS Initiative at CIBA Chennai on 25<sup>th</sup> October 2014
- Workshop on “Frontier Home Science Technologies for Knowledge and Economic Empowerment” held at UAS Dharwad from 28-30<sup>th</sup> October 2014
- Training on Participatory Impact Monitoring and Assessment at KVK, Erode from 19<sup>th</sup> to 24<sup>th</sup> November 2014 and KVK, Mysore from 1<sup>st</sup> to 6<sup>th</sup> December 2014.
- Database management training for the Programme Assistants (Computer) of KVKs of Zone-VIII in two batches at KVK Pathanamthitta during 11-13<sup>th</sup> November 2014 and at KVK Mysore during 16-17 December 2014.
- Interactive Meeting of Union Agriculture Minister with Agriculture Experts on 9<sup>th</sup> January, 2015.
- Annual Action Plan Workshop 2015-16 for KVKs of Tamil Nadu and Puducherry during 11<sup>th</sup> to 13<sup>th</sup> March 2015.
- Annual Action Plan Workshop 2015-16 for KVKs of Karnataka and Goa during 17<sup>th</sup> to 19<sup>th</sup> March 2015.
- Annual Action Plan Workshop 2015-16 for KVKs of Kerala and Lakshadweep during 24<sup>th</sup> to 25<sup>th</sup> March 2015.

#### 6.2 Participation in Meetings / Workshops/ Conferences/Seminars

The Zonal Project Director/Scientists/ Officials of this Directorate participated in the following meetings/workshops/ conferences/



seminars/training programmes held during the period under report:

- Scientific Advisory Committee meetings organized by KVKs in Zone VIII.
- Technology Week Celebrations held in KVKs of Zone VIII
- Orientation Programmes to the newly recruited KVK staff of Zone VIII
- Brainstorming Session on “Integrated farming systems” held at University of Agriculture and Horticulture University, Shimoga on 4-5<sup>th</sup> April 2014.
- Brainstorming session on “Contingency plans operationalization” on 9<sup>th</sup> and 10<sup>th</sup> May 2014 at ICAR, NRM Division, New Delhi.
- Interface meeting on Operationalization of district specific contingency plans for Kharif 2014 for Karnataka state on 23<sup>rd</sup> May 2014 at UAS, Bengaluru
- Third Annual Workshop of NICRA held at NASC, New Delhi from 2-4<sup>th</sup> July 2014
- KVK Interface for Tamil Nadu state at Agriculture College, TNAU, Madurai on 23<sup>rd</sup> July 2014.
- ICAR-DAC interface meeting at ICAR-NRM Division, New Delhi on 13<sup>th</sup> October 2014.
- NICRA Steering Committee meeting of KVK Tumkur-A at KVK Hirehalli on 31<sup>st</sup> October 2014.
- National level NICRA meeting at CRIDA, Hyderabad on 29<sup>th</sup> October 2014.
- Institute Management Committee meeting of ZPD, Zone-VIII was attended as special invitee on 25<sup>th</sup> April 2014.
- Brainstorming Session on “Monitoring and Evaluation of Projects in Agriculture” held at Institute of Social and Economic Change, Bengaluru on 28<sup>th</sup> June 2014
- International training programme "Market Access for Sustainable Development; Towards pro-poor and smallholder inclusive market development" November 10-28, 2014, at The Centre for Development Innovations (CDI), Wageningen UR, The Netherlands
- National Conference on Sustainability and Profitability of Coconut, Arecanut and Cocoa Farming – Technological Advances and Way Forward” at CPCRI Kasaragod on 22<sup>nd</sup> and 23<sup>rd</sup> August 2014
- Brainstorming Session on Creating and Sustaining Interest in Agriculture among the Youth. The Hindu - NARS Initiative
- Workshop on “Frontier Home Science Technologies for Knowledge and Economic Empowerment” held at UAS Dharwad from 28-30<sup>th</sup> October 2014
- National Seminar on Climate Change and Agrarian Economy at UAS Dharwad during 22-23 January 2015

## Chapter 7

# Personnel

Existing staff position of the Zonal Project Directorate, Zone VIII, Bangalore as on March 31, 2015 is presented below:

Research Management	Dr.Sreenath Dixit	Zonal Project Director
Position		
Scientific	Dr.M.J.Chandre Gowda	Principal Scientist (Agricultural Extension)
	Dr.D.V.Srinivasa Reddy	Principal Scientist (Agronomy)
	Dr.C.V.Sairam	Principal Scientist (Agricultural Economics)
	Dr.B.T.Rayudu	Principal Scientist (Agricultural Extension)
	Dr.D.V.Kolekar	Scientist (Agricultural Extension)
Technical	Shri R.S.Ramamurthy	Field Officer
	Dr.Mallikarjun Hanji	Computer Programmer
	Shri M.N.Prasad	Driver
Administrative	Mrs.C.Sunanda	Finance and Accounts Officer
	Shri J.Mathew	Assistant Administrative Officer
	Shri J.Prabu Kumar	Assistant
	Mrs.Ramola Pinto	Junior Stenographer
	Shri N Vinod Kumar	LDC
	Ms.K.Roopakala	LDC
	Supporting	Shri Channkeshava