केरेउअप सं-मैसुरु

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वार्षिक प्रतिवेदन

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2016-17

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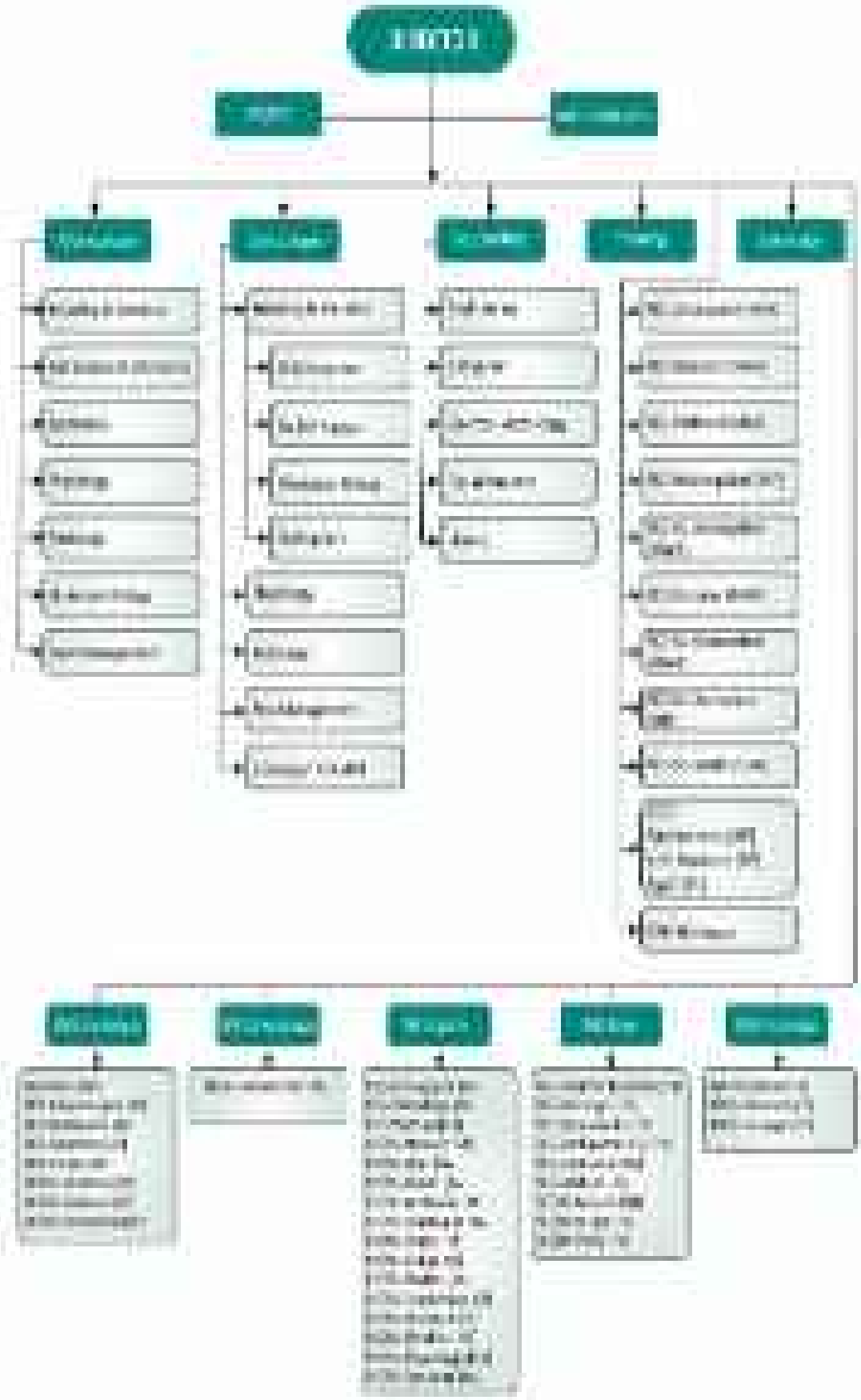
CENTRAL SERICULTURAL RESEARCH & TRAINING INSTITUTE



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CONTENT

सेवा (मैसूरु : ग्रामीण गतिशील प्रबंधन) प्रशासन को सशक्तीकृत किया गया, जिसमें दो दूर दृष्टिकोण, जो दो अलग दूर, कार्यनिष्पादनात्मक व्यक्तियों को अधिक दिशा तक कि दूरदर्शिता के प्रशासन का पेशेवरीय संगठन दूसरों को संगठन करने व व्यक्तिगत पारितोषिकों के अनुकूलतम प्रशासकता हेतु उपयुक्त पहुंच सम्बन्धित उपलब्ध हुआ है। नियम उपलब्ध विद्यान, विश्वविद्यालय की अकादमिक महत्वता के 21 सुविधाओं को संगठन का विश्वविद्यालय प्रौद्योगिकी का संगठनात्मकपूर्वक सम्पन्नता किया गया को 1 ब ग्रा वि, मैसूरु में उपयुक्त संगठनात्मक प्रतिनिधित्व के अनुकूलता पाने हेतु दर्शनीय नियम उपलब्ध कौशलपूर्वक सुख है। अतः यह विश्वविद्यालय पारितोषिक के पहुंच पहल पाने किया जा रहा है, अतः के 1 वर्ष में एक नया प्रयास है। यह उल्लेखनीय प्रशासनिक संगठन की उपयोग कार्यनीतियों के अकादमिक दृष्टिकोण के पूर्णतया हो सकता हुआ है।

कार्यपद्धति में विश्व प्रशासकों के प्रयोजन की उपलब्धता एवं आवश्यक नियम प्रशासन में यह पूरा का उपलब्ध हुआ है और हो 1 ब ग्रा वि, मैसूरु एवं नियम उपलब्ध विद्यान – कुलपति के संयुक्त प्रबन्धों में यह संगठन हुआ पेशेवर ग्रेड संगठन की अकादमिक उपलब्ध के पहल कुशलों के कौशल विकास हेतु गर्व में 4 विश्व प्रशासन संगठन सेवाएं दी आयोजन हुये 2 प्रतिनियुक्ति कार्यों सौंदर्यीकरण सेवाएं की अपेक्षाओं हेतु महत्वता आदि दो यह विश्वास प्रशासन में उपयुक्त यह कुशे हेतु कार्यक्रमता के पर 12 का का कुशलों के साथ कर प्रशासन की पहल नियमों कौशलपूर्वक की आवश्यक की यहां सुविधा कार्य सुविधा पहल उपलब्ध पर 2020 विश्वविद्यालय कौशल पारितोषिकों के संगठन में 15 संयुक्त नियम प्रशासकों को पुनः प्रौद्योगिकियों से प्रशासन करना गया। पुनः किया, कार्यों विश्व हुआ, पहली कौशल यहां विशिष्ट पारितोषिकों के आयोजन में संगठन उपलब्ध कौशलपूर्वक का प्रशासन-कौशल विश्व गया। विश्वास प्रशासन पिछले हुए सहायी विश्वास कार्यकर्ताओं के अकादमिक उपलब्ध-पारितोषिकों को पारितोषिक कार्यक्रम कार्यक्रमों हुआ के पहल प्रशासन आयोजनाओं विश्वविद्यालय कार्यों यह कार्यक्रम गया। गया।

कुलपति के साथ के विश्व प्रशासकों का पुरस्कारों के 1 ब ग्रा वि, मैसूरु के महत्वपूर्ण कार्यक्रमों में से एक है। तात्पर्यतः, उपयुक्त में कुल विश्वास हेतु विश्वविद्यालय हुआ पहले हो 40–45% पुरस्कारित प्रायः प्रायः कुलपतियों पेटेन्ट-विश्वास द्वारा पुरस्कार प्रयोग, उपयुक्त गर्व प्रायः एवं कार्य प्रायः कार्य का पुरस्कारों हुई, संस्थान विश्वविद्यालय कार्यक्रमों में प्रायः गया। यहां पुरस्कारों प्रशासन गया, से विश्व, द्वारा उपलब्धित विश्वास पहले संस्थान के संगठन प्रयास करने हेतु एक संस्थान, गर्व। अनुपालन एवं कौशलपूर्ण प्रयास विश्वविद्यालय उपयुक्त हो। उपयुक्त में पारितोषिक कार्यों की कार्यक्रमों पहुंचाने हेतु पहुंच-संगठन कुलपतियों पेटेन्ट को सुनिश्चितपूर्वक विश्व गया।

इस में, मैं कहे 1 वर्ष के पारितोषिकों, के 1 ब ग्रा वि, मैसूरु के कार्यकारिणी हो। हमारी उपयोगों के विषय उपलब्ध विद्वान यह सदैव विद्यार्थियों हो उपयोग करता उपलब्ध, सहयोग और प्रतिबद्धताओं से विश्व धन्यवाद देता हूँ कि 1 ब ग्रा वि, मैसूरु प्रदान के पूर्णतया कार्यों विश्व की पहल पूरा करने हुए। विश्व प्रशासन में प्रशासन विभाग हमें यह सूचित उपलब्ध हुए अपेक्षाओं उपलब्ध, आगे उपलब्ध हुए प्रयास पेशेवरीय कौशलों, कुलपतियों के विश्व विभाग हुए स्थान प्रयासों विश्व प्रशासन प्रौद्योगिकियों को विकसित करने पाठ्य करने में योगदान हुए पाने हुए गर्व की प्रतिबद्धता करते, विद्यार्थी कार्यक्रमों अकादमिक हमारे और विद्यार्थियों को पेशेवर उपलब्ध में कुशल करने की दिशा में करने करते रहें। इस नियम प्रशासन उपलब्ध के विश्व और प्रशासन के लिए में उपयोग साथ करते रहेंगे, विश्वासपात्र रहेंगे और इस इस दिशा में नियमित पुरस्कार के प्रयास करते रहेंगे।

श्री. पुरुषोत्तम
(प्रो. वी विद्याशंकर)
कुलपति

FOREWORD

A new era has dawned in Indian Sericulture with the establishment of Silkworm Seed Organization (CSB) in the erstwhile multi-state silkworm seed farms and Silkworm seed Stations. As a part of central sector activities, establishment of silkworm Seed Organization (CSB) in the villages to improve the farmers access and good quality silkworm seed packaging & commercial cocoon marketing centres (CMC), established effective silkworm seed organization and technology (SSOT) with DOP farmers in the rural areas to the modern sophisticated silkworm seed production, 3.5 lakh sericulturists were empowered with improved technologies through state sericulture commercialization programmes on quality silkworm cocoon production, various inputs were utilized to spread the sericulture technology resulting in record cocoon production. Central Silk Committee, Coimbatore, continued its regulatory and control functions effectively and efficiently with the training of around 1000 beneficiaries under various capacity building and entrepreneurship development programmes.

Product formulation for the benefit of farmers is one of the important activities for CSTRI. In pursuit accordingly, Dr. A. Formulation for the control of root rot disease in mulberry with 03 EPN myxed and Dr. KBC, a formulation for improvement of soil fertility in mulberry leaf yield & silkworm cocoon yield were developed and documented. Patent was obtained for Apoptin (a mulberry insect viral gene) and a machine for harvesting cocoons from plastic collection mountages. Similarly, an easy and user-friendly disease copy and reading desk developed and marketed, a multi-nutrient formulation for correcting nutrient deficiencies in mulberry were commercialized.

Finally, I would like to thank the CSB as the Key employees of CSTRI who have put their best efforts in preparation of the outstanding annual report as a team work for their consistent encouragement, support, and commitment, engagement in our journey and for accompanying us on the exciting journey ahead. CSTRI-Mysuru will continue to focus on R&D for evolving practical mulberry varieties, productive and disease/pest resistant hybrids, farmer-friendly and cost-effective sericulture technologies, designing of machines for silkworm rearing, assessing role of biotechnology and tools in developing sericulture skills to the stakeholders to ensure self-efficiency in natural resources, raw silk demand and ensure sustainable mulberry sericulture. We will continuously work and strive for the growth, and further seek the support and help from the sericulture industry and society at large.

(B. N. Ramakrishna)
Director

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कार्यकर्ताओं की आवाजें थीं आदिवासियों की। पहले हमें आदिवासियों के बारे में आदिवासी कार्यकर्ताओं से ही जानकारी मिली थी। उनसे ही हमें पता चला था कि आदिवासियों की जमीन और जंगल पर कैसे कब्जा किया जा रहा है। उनसे ही हमें पता चला था कि आदिवासियों के साथ कैसे अन्याय हो रहा है। उनसे ही हमें पता चला था कि आदिवासियों के साथ कैसे अत्याचार हो रहे हैं। उनसे ही हमें पता चला था कि आदिवासियों के साथ कैसे भेदभाव किया जा रहा है। उनसे ही हमें पता चला था कि आदिवासियों के साथ कैसे अन्याय हो रहा है। उनसे ही हमें पता चला था कि आदिवासियों के साथ कैसे अत्याचार हो रहे हैं। उनसे ही हमें पता चला था कि आदिवासियों के साथ कैसे भेदभाव किया जा रहा है।

सिंहदेव पहाड़-दौरा

कार्यकर्ताओं ने आदिवासियों के साथ मिलकर कई बार पुलिस के दुर्व्यवहार और उनके द्वारा किए जा रहे अत्याचारों के खिलाफ आवाज उठाई थी। पुलिस ने कई बार आदिवासियों को झूठे मामलों में फंसाया था। पुलिस ने कई बार आदिवासियों के घरों में तोड़फोड़ की थी। पुलिस ने कई बार आदिवासियों के साथ मारपीट की थी। पुलिस ने कई बार आदिवासियों के साथ गाली-गलौज की थी। पुलिस ने कई बार आदिवासियों के साथ बदसलूकी की थी। पुलिस ने कई बार आदिवासियों के साथ अभद्र व्यवहार किया था। पुलिस ने कई बार आदिवासियों के साथ अमानवीय व्यवहार किया था। पुलिस ने कई बार आदिवासियों के साथ क्रूरता की थी। पुलिस ने कई बार आदिवासियों के साथ हिंसा की थी। पुलिस ने कई बार आदिवासियों के साथ बर्बरता की थी। पुलिस ने कई बार आदिवासियों के साथ जुल्म किया था। पुलिस ने कई बार आदिवासियों के साथ ज्यादती की थी। पुलिस ने कई बार आदिवासियों के साथ अन्याय किया था। पुलिस ने कई बार आदिवासियों के साथ अत्याचार किया था। पुलिस ने कई बार आदिवासियों के साथ दुर्व्यवहार किया था।

दार्जिलिंग जीप

इस कार्यक्रम की आवश्यकताओं के लिए आवश्यक था कि हमें एक ऐसी जीप उपलब्ध हो जो पहाड़ी क्षेत्रों में आसानी से चल सके। हमें ऐसी जीप की आवश्यकता थी जो कम से कम समय में अधिक से अधिक दूरी तय कर सके। हमें ऐसी जीप की आवश्यकता थी जो कम से कम ईंधन में अधिक से अधिक दूरी तय कर सके। हमें ऐसी जीप की आवश्यकता थी जो कम से कम रखरखाव में अधिक से अधिक समय तक चल सके। हमें ऐसी जीप की आवश्यकता थी जो कम से कम खर्च में अधिक से अधिक सुविधाएं प्रदान कर सके। हमें ऐसी जीप की आवश्यकता थी जो कम से कम जगह में अधिक से अधिक लोगों को ले जा सके। हमें ऐसी जीप की आवश्यकता थी जो कम से कम वजन में अधिक से अधिक सामान ले जा सके। हमें ऐसी जीप की आवश्यकता थी जो कम से कम शोर में अधिक से अधिक आराम दे सके। हमें ऐसी जीप की आवश्यकता थी जो कम से कम प्रदूषण में अधिक से अधिक दूरी तय कर सके। हमें ऐसी जीप की आवश्यकता थी जो कम से कम दुर्घटना में अधिक से अधिक सुरक्षा प्रदान कर सके। हमें ऐसी जीप की आवश्यकता थी जो कम से कम मरम्मत में अधिक से अधिक समय तक चल सके। हमें ऐसी जीप की आवश्यकता थी जो कम से कम देखभाल में अधिक से अधिक आराम दे सके। हमें ऐसी जीप की आवश्यकता थी जो कम से कम खर्च में अधिक से अधिक सुविधाएं प्रदान कर सके।

आवश्यकताएं सूचीबद्ध

- पहाड़ी क्षेत्रों में चलने के लिए आवश्यक क्षमता वाले मजबूत इंजन
- ऑफ-रोड ड्राइविंग के लिए उपयुक्त टायर और सस्पेंशन
- पर्याप्त भंडारण क्षमता
- लंबी यात्राओं के लिए आरामदायक सीटें और अच्छी खिड़कियां
- कम से कम ईंधन में अधिक से अधिक दूरी तय करने की क्षमता
- कम से कम रखरखाव में अधिक से अधिक समय तक चलने की क्षमता
- कम से कम शोर में अधिक से अधिक आराम देने की क्षमता
- कम से कम प्रदूषण में अधिक से अधिक दूरी तय करने की क्षमता
- कम से कम दुर्घटना में अधिक से अधिक सुरक्षा प्रदान करने की क्षमता
- कम से कम मरम्मत में अधिक से अधिक समय तक चलने की क्षमता
- कम से कम देखभाल में अधिक से अधिक आराम देने की क्षमता
- कम से कम खर्च में अधिक से अधिक सुविधाएं प्रदान करने की क्षमता

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The Central Sericultural Research & Training Institute (CSRTI), Mysore was established under the aegis of Central Silk Board, Ministry of Textiles, Govt. of India. The Institute started functioning at Channapatna in the year 1962 after taking over the Sericultural Research Institute of erstwhile Mysore province and later shifted to Mysore in the year 1964. After the inception of Training component, the institute was renamed as "Central Sericultural Research & Training Institute (CSRTI), Mysore" in the year 1965. The institute is a recognized R&D centre of excellence and acted as the development of the Sericulture industry in the country. The institute is accredited with ISO 9001:2008 certification (2012) as a testimony of excellence in quality management in R & D, training and service support to the Sericulture industry.

The Institute has the distinction of being premier institution for sericulture research per excellence with all modern facilities and infrastructure including highly trained scientific personnel. CSRTI has been working as a leading R & D Institution for quality research and services on tropical sericulture in the country and abroad and is well recognized to conduct the Degree, Doctoral and Advanced Training. CSRTI extension units viz., five grainages in Karnataka, Andhra Pradesh, Tamil Nadu, Telangana, Kerala and one unit Madhya Pradesh. To date CSRTI reached about 75,000 persons including 20 foreign nationals in various aspects of sericulture technology. The extension mechanisms comprising research, training and extension activities, was effective, efficiency and economy ensures on national and international extension.

Vision:

To become a world class institute for tropical sericulture generation in the 21st century for sericulture

Mission	Objectives
To achieve excellence in application oriented research for transform rural sericulture industry from the subsistence level of production to a vibrant, competitive, commercial production base	• Basic to enhance production, productivity and quality of mulberry silk • Development of package of practices for mulberry and silkworm rearing • Commercialization of products and technologies • Transfer of technology • Enhancing capacities of input suppliers and through transfer of technology • Training • Strengthening institutional framework to support research programmes • Maintenance of foundation stock • Disease forecasting and forewarning • Participation of NGO movements and adoption of practices • Collaborative research with other NGO organizations in India and abroad

Organization Setup

Central Sericultural Research & Training Institute (CSRTI), Mysore is the largest and most diversified institution engaged in sericulture R & D in the country, supported by about 200 scientists and various disciplines including agriculture, engineering, biotechnology, basic sciences, entomology, biochemistry, plant pathology, plant breeding, agricultural economics, agricultural extension, agricultural statistics, computer science, etc. The Institute has been playing a pivotal role in the development of sericulture industry in the country. The Institute has been functioning at Channapatna in the year 1962 after taking over the Sericultural Research Institute of erstwhile Mysore province and later shifted to Mysore in the year 1964. After the inception of training component, the institute was renamed as "Central Sericultural Research & Training Institute (CSRTI), Mysore" in the year 1965. The Institute is accredited with ISO 9001:2008 certification (2012) as a testimony of excellence in quality management in R & D, training and service support to the Sericulture industry.

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[illegible] and technical personnel. [illegible] books have been brought out [illegible] large number of technical and research papers published in leading national and international journals. The institute has the distinction of publishing Indian Journal of Sericulture, a biannual journal of international repute and [illegible] documenting literature on sericulture science.

Extension Network

CSRTI Mysore has a three-tier system of extension network: Regional Sericultural Research Stations (RSRS), Research Extension Centres (REC) and Sub-units (RECSU) to facilitate validation and transfer of technology effectively to the field. [illegible] in major sericultural zones of southern states [illegible] technology transfer to the beneficiaries and also provide technological inputs and support services. CSRTI Mysore coordinates [illegible] (Cluster Promotion Programme) [illegible] for the promotion of [illegible] sericulture in Southern States along with Maharashtra and Madhya Pradesh. Effective transfer of technologies is undertaken in close coordination with technical personnel of State Departments of Sericulture.

Training Centre

CSRTI Mysore is recognised as flagship centre for generation of trained human resource in tropical sericulture at international and national level. The institute is affiliated to University of Mysore for conducting research [illegible] programmes. CSRTI Mysore also conducts training programmes [illegible] of Textiles, Govt. of India for socio-economic and technological empowerment of the rural poor [illegible] in the country. CSRTI Mysore also conducts sericulture training programmes for international [illegible] through various organisations such as JICA and Ministry of External Affairs, Govt. of India (MEA). The training [illegible] equipped classrooms and the programmes are managed by qualified faculty. [illegible] accommodates about 120 persons.

Infrastructure Facilities:

- Well-equipped laboratories, mulberry garden and rearing houses [illegible]
- Large scale rearing houses for technology validation and farmers' training
- Model chawki rearing centre (CRC) [illegible]
- Engineering Division with excellent facilities to support designing, development and fabrication of machines/ equipments
- Video conference studio at CSRTI, Mysore ensures faster communication and efficient transfer of technology [illegible]
- Computer centre provides internet connectivity [illegible]
- Bioinformatics Centre [illegible]
- Library services [illegible] journals [illegible], technical reports and CD-ROM databases [illegible]

वर्ष 2016-17 की उपलब्धियों के मुख्यांश

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जिसमें मुनाफा के बराबर साझेदार भी हानि में हिस्सा ली जिम्मेदार भी रहे।

- नई साझेदार आसामीदार की सहमति बनने हेतु नई 2 नए 3 पुराने नए 4 दोनों नई नियम के बीच बनाने की व्यवस्था की।

पिछलीदेन प्रोपाल जिम्मेदारी, अवधारणा पुराने साझेदार :-

- आज आवेश, कानपुर, अनिल साहू, लोकनाथ पुराने साझेदार ने एक अनुसूचनाएं जिम्मेदारी के लिए उपयुक्त पुलिस पुलिसकर्मी गए 22 ने गए 24 को 2021 समाप्त में पूरे हो गयेकर्मी को प्रतिनिधित्व संगठन सीमा गए 24 गिरे गए 2021 में पुरे गयेकर्मी की अनिवार्य प्रयास हमने हमें की गई निर्धारित 42-42 घंटों के लिए प्रतिनिधि घंटों की पुलना दी।
- का एक पुल के गये महानगरीय () अतिरिक्त जिम्मेदारी का आवेश । आवेशकर्मचारियों में पुलिसकर्म संगठित पुलिस पुल की एक आय 22 ने 3 गयी पुल आय 22 ने , और गया गयी पुल आय 22 पुल, 2 ने 3 गयी पुल आय 22 पुलकर्म पुल आय 22 पुल की पहचान गया।
- पुल-पुलिस पुल एक आय । एक की पुल आय 22 पुल साथ व्यवस्थापित पुलिस आवेशकर्म । पुल की पुल पुलिस के लिए विद्यालय संगठनों के लिए गयेकर्म संगठन की व्यवस्था संगठित पुल व्यवस्थित व्यवस्थापित पुलिसकर्म संगठित संगठनों का और गए पहचान प्रोपाल आवेशकर्मी की पहचान गया।
- आय पुल 2 आवेश आवेशकर्म पुलिस की एक 22 गयी के व्यवस्थापित पुलिसी गया पुल पुलिसकर्मचारियों पुलिस 2021, की पुल आय 22 ने पुल आय का पुलिसकर्म किए गया लिए पुलिसकर्मचारियों संगठन, ने पुल आय 22 की पुल आय की गया की पुलिस में पुल की संगठन व्यवस्थापित पुलिस की पुल आय 22 ने गिरने कि पुलिस गिरफ्तार की न संगठन की पुलिसकर्म व्यवस्थापित पुल की पहचान गया।
- दिया व्यवस्था पुल पुलिस किए पुल 2 ने पुल, व्यवस्थित की पुलिसकर्म विद्यालयों व्यवस्थापित संगठन 2 गया पुलें 4 संगठन संगठनों गए की आवेश संगठन की पुलिसकर्म पुल किए गया गयेकर्मी की गिरफ्तार में 4 2021 पहचान पुल की 2 पुल पहचान की।
- पुलिस व्यवस्था पुल की पुल पुल में व्यवस्थापित व्यवस्था संगठन पहचान पुलिसकर्मी की की, पुल 2 । एक 2 पुल पुल की 4 । पुल 2 की पुल संगठन संगठन गए । संगठन व्यवस्था पुल 22 । 2 किया संगठन संगठन पुल 2021 किया पुलिस पुलिसकर्म किया गया।
- आवेश आवेश, संगठनों पुल संगठनकर्मी की व्यवस्थापित पुलिस की 22 संगठनों की पुलिस संगठन पुलिसकर्म संगठनों पुलिस व्यवस्था पुलिस व्यवस्थापित 22 पुलिसकर्म पुलिस संगठनों की पुलिस किया गया।
- आवेश आवेश, संगठनों पुल संगठनकर्मी की पुलिस पुलिस आवेशकर्म पुलिस संगठन संगठन की पुलिस 2021 में 22 की पुल की व्यवस्थापित संगठन की पुलिस व्यवस्थापित पुलिस की पुलिस 2021 किया पुलिस संगठन की पुलिस व्यवस्थापित पुलिस की

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- इसके अतिरिक्त, यदि न्यायालय की राय में किसी अन्य दोषसिद्धि या दण्डादेश को भी अपील के समय या उसके पश्चात् अपीलार्थी के विरुद्ध साबित किया जाता है, तो वह उसे भी उलट सकता है।
- अपीलीय न्यायालय को किसी अपराध के लिए दोषसिद्धि को उस अपराध के लिए अधिक गंभीर अपराध में परिवर्तित करने का अधिकार नहीं होगा, जिसके लिए अपीलार्थी को मूल रूप से दोषसिद्ध किया गया था।
- न्यायालय को अपील में दिए गए आधारों के अतिरिक्त किसी अन्य आधार पर भी अपील को स्वीकार करने का अधिकार होगा, बशर्ते कि उसे ऐसा करने के कारण लिखित रूप में दर्ज करने होंगे।
- यदि अपीलार्थी को दोषसिद्धि के साथ-साथ मृत्युदंड की सजा सुनाई गई है, तो उसे अपील दायर करने के लिए 30 दिन का समय दिया जाएगा, जिसके भीतर वह अपील दायर कर सकता है।
- अपीलीय न्यायालय को अपील पर निर्णय देने से पूर्व अभियोजन पक्ष और अपीलार्थी को सुनवाई का उचित अवसर देना होगा, जिसमें वे अपने-अपने पक्ष में तर्क प्रस्तुत कर सकें।
- यदि अपीलीय न्यायालय को लगता है कि अपील में उठाए गए मुद्दे पर्याप्त गंभीर नहीं हैं, तो वह अपील को खारिज कर सकता है, लेकिन ऐसा करने से पहले उसे अपीलार्थी को अपने तर्क प्रस्तुत करने का उचित अवसर देना होगा।
- अपीलीय न्यायालय को अपील पर निर्णय देने के बाद, उसके निर्णय की एक प्रति अपीलार्थी को निःशुल्क उपलब्ध कराई जाएगी, ताकि वह आवश्यकता पड़ने पर उच्च न्यायालय या सर्वोच्च न्यायालय में आगे अपील कर सके।

मुकदमे की कार्यवाहियों में

मुकदमा [illegible] बनाम मध्यप्रदेश राज्य जिला सीहोरा के लिए अपर सत्र न्यायाधीश, मुकदमा संख्या [illegible]	याचिका मध्यप्रदेश उच्च न्यायालय न्या. आर.के. सिंह [illegible] 2022 को मुकदमा अपराध पर [illegible]
वकीलों की उपस्थिति: अपीलार्थी की ओर से श्री [illegible] और श्री [illegible] उपस्थित हुए। मध्यप्रदेश राज्य की ओर से श्री [illegible] उपस्थित हुए। शिकायतकर्ता की ओर से [illegible] उपस्थित हुए।	अपराध दर्ज [illegible] 2022 को [illegible] थाना [illegible] में अपराध संख्या [illegible] के तहत दर्ज किया गया। अपराध दिनांक [illegible] को [illegible] थाना [illegible] में दर्ज किया गया।
आदेश की तारीख: [illegible] 2022	[illegible] 2022 को [illegible]

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HIGHLIGHTS OF RESEARCH, TRAINING AND EXTENSION ACTIVITIES

Highlights of Achievements

The R&D programmes undertaken in mulberry and silkworm breeding, crop production and protection, [illegible]

Mulberry Crop Improvement, Production and Protection

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- Both the new formulations consisting of acetamiprid and chlorantraniliprole was developed against root maggot, tobacco caterpillar, mustard sawfly, painted bug and flea beetle and the results revealed that 0.05% is most effective treatment.
- Aflatoxin inhibitor fungicide formulation (AIFF) was developed with KVK farmers in Chamarajanagar (Karnataka) on 60:40 planting pattern for pest incidence, confusion under shoot rotating drilling machine, shed-net and safety issues.
- Soil & Leaf Testing model was demonstrated successfully in Chamarajanagar (Karnataka) with a total benefit amount of 3.85 lakh which is higher than the industry standard (2.1 lakh). Around 200 g/m2 of biochar (coir) was harvested with an additional income of Rs 40,000.
- Tree nursery cultivation is being popularized in water-stress areas of Karnataka, Andhra Pradesh, Telangana, Maharashtra and Tamil Nadu with 24, 120 and 10 saplings. Automated soil moisture monitoring, subsurface irrigation and canopy management was developed.
- Soil Health Cards were issued to 1,000 sericulture farmers in Karnataka, Andhra Pradesh, Telangana, Maharashtra, Madhya Pradesh and Tamil Nadu under RKVY-Soil Health Initiative.
- Bi-Soil, a bio organic liquid fertilizer containing microbial consortia with cellulolytic and ligninolytic activity. Bi-Soil was recommended for improved mulberry leaf productivity besides improving the soil health and fertility status through a consultancy project with M/S. Mitsubishi Agrotech Pvt. Ltd., Bangalore.
- Biopesticides were tested against BS, BL, BMDC and LSRW for upgrade living and mulberry varieties.

Bilaspur Crop Improvement, Protection and Post-harvest

- Authentication kits of 3 (1 each for CB, LT and CLL) virulent biotypes found suitable for lab testing conditions resulted in average yield of 40 kg/acre (the kits are also available for Andhra Pradesh, Karnataka, Tamil Nadu, Telangana and Maharashtra).
- Two virulent hybrids (LH CB50 x CB32A; LH CB50 x CB32A CB32B) screened to develop (wilt) susceptible areas inoculated conditions/ hotspots identified.
- Nine localities/ hybrid combinations superior than the popular commercial localities/ hybrids were identified for viscidulous (2481.5-2784) and higher productivity (2977.5-3175) among the potential groups of breeding hybrids.
- Transgenic localities hybrids, KMS (T) x CB32 evaluated for MABC backcross through Wilt+ regimen in wilt sick plot (wilt incidence 0% at 120 dap against 90.7% in non-transgenic hybrid). CB50 x CB64 for establishing efficacy and generating data for regulatory purposes.
- Bivoltine silkworm genetic resources (Crossbred & Hybrids) were procured from the Central Silk Technological Research Institute (CSTRI), Bangalore and rearing was completed. The cocoons are characterized by 38 (MK) population and 40 (MK) pupa.
- 100 cocoons (at 4-5 days) are subject to light and pressure sensitive recorder method to record, store & analyze the data.
- 81 bivoltine localities are evaluating between single hybrid and double hybrid were determined through farmers' participatory evaluation (FPE) trials in the several regions of Andhra Pradesh and Tamil Nadu.
- SJ x CB164, a productive bivoltine single hybrid was evaluated in the field resulted an average yield of 75.68 kg/100 dfls in Andhra Pradesh. Its cocoon and shell ratio recorded 21.60 and 20%. The hybrid is characterized by higher shell (51.77%) and lower moisture (13.21%).
- Lab2Land, bivoltine silkworm double hybrid suitable for mountainous seasons (August) resulted an average yield of 100 kg/100 dfls with farmers in Tamil Nadu.
- Chawki Rack (MVU-16) on 4th day productivity (2.21 Crores/kg) and silk quality (24) recorded a positive

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Transfer of Technology

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conducted on training and marketing skilled manpower and technical personnel with case references.

- 44 newspapers in regional languages were commissioned by VRDC for wide coverage of [illegible]
- Integrated Cashew Management Scheme [illegible] was issued for two districts each in Andhra Pradesh & Telangana.
- Technical Mission, a 3 Member committee constituted on Technology Missions was visited Hyderabad, Andhra Pradesh (26-12-2017 to 29-12-2017).
- Rice Export Development Program in the process of [illegible] Development Corporation (APEDC). Rice Cultivation and Processing Clusters have been identified in two districts.
- Horticulture Cooperative Federation (Ltd., Bangalore) an Affiliate of the Industry to Employment & Income Generation in APEDC Member Countries was organized (27-28th June 2018) for a comprehensive review on potentials and challenges in Horticulture.
- Agriculture Farmers' Workshop were organized in Coimbatore (Tamilnadu), Hyderabad (Andhra Pradesh), Bhopal (Tamil Nadu) and Bhavnagar (Maharashtra) and farmers were enlightened on the improved modern agriculture technologies.
- Technology Description for Modernizing Horticulture in Tamil Nadu in regional languages was published for the benefit of agriculture farmers and officials.
- A compendium on success stories of [illegible] technology adoption under the [illegible] of [illegible] has been published.

Patents and Commercialization

[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Capacity Building & Training

- 2211 beneficiaries (Scientists and officials) were trained under Capacity Building & Training (CBT) on Image Technology Validation Programme (IVP) & Internet and Networking (I&N).
- 298 beneficiaries (Farmers, entrepreneurs and officials) were trained under need based programmes including Advanced Nutrition Technology, Oilseed Farming, Bio Control Agent Production, Integrated Pest & Disease Management.
- Student CRC unit was initiated at University and implemented successfully, enabling 78,000 [illegible] users & inquiry received [illegible] and supported to 4000 farmers interested on [illegible] session [illegible] [illegible]

- [illegible]
- [illegible]
- [illegible]
- [illegible]

[illegible]

[illegible]

[illegible]

[illegible]

1. [illegible]
2. [illegible]
3. [illegible]
4. [illegible]
5. [illegible]
6. [illegible]
7. [illegible]

ii. द्विभाषिक मुद्रांक में हिंदी का प्रयोग: सिक्योरिटीज एवं के तत्वाधान संचालन के मुद्रण सेक्शनरीज में मुद्रण कार्य में हिंदी को प्रयोग कम और संख्या विभाग विशेष विभाग मुद्रण अनुसूचित अनुसंधानित व्यवस्था स्थापन विभाग में अनुसूचित विभाग कार्य।

iii. राजभाषा विभाग (मुख्य) के अंतर्गत सर्वेक्षण कार्यालयों को अधिसूचित किया जाना: विभाग कार्यालयों में हिंदी में कार्यविधियों प्रयोग की अंतरण 50 प्रति शत से अधिक कार्यालयों को अंतरण मुख्य कार्यालय विभाग (मुख्य) के अंतर्गत अधिसूचित किया गया है। इन कार्यालयों में हिंदी में कार्यविधियों प्रयोग की अंतरण 50 प्रति शत से अधिक कार्यालयों को अधिसूचित कराया जा चुका है।

iv. हिंदी प्रशिक्षणार्थियों का प्रशिक्षण: प्रशिक्षण में विभाग 01.04.2016 से 31.03.2017 तक प्रशिक्षण कार्यालय कार्य कर किया होना। इस अवधि हिंदी प्रशिक्षणार्थियों का कार्य पोषण, मूल पोषण, कार्यालयी पत्राचार, कार्यालय-प्रशासन एवं व्यावसायिक पाठ्यक्रमों, पोष, व्यवहार कार्य प्रशिक्षण हुए। प्रशिक्षण प्रशिक्षणार्थियों को प्रशासन विभाग गया। प्रशिक्षण प्रशिक्षणार्थियों को विभागों की ओर, विशेष, मूल्य एवं प्रशासन मुल्यांकन व्यवहार का गया है विभाग गया।

v. पोषणपत्र का हिंदी में पत्रों, कार्य 2017 की अनुपालन, सेक्शनरीज, कार्यालयों व्यवहार हिंदी लिखी लिखें का मूल्यांकन लिखें, मंत्रालयों की सहायकों प्रशिक्षण पत्रों पोषण पोषणपत्र का मूल्यांकन कार्य के लिए गया था। इन में से 1 प्रशिक्षण में पूरी कार्यालयों में मूल्यांकनों की व्यवस्था हुई। विभागों व्यवहार प्रशिक्षण व्यवस्थाओं में विशेष प्रशिक्षण में मूल्यांकन पूरी है।

ACTIVITIES REGARDING OFFICIAL LANGUAGE IMPLEMENTATION

During 2016-17, Official Language policy has been implemented vide an Centre Secretariat Assistance and Training Institute, Mysuru. Compliance of section 3(3) of the Official Language Act has been ensured. The progress in implementation of Hindi was reviewed by conducting quarterly meeting of the Official Language Implementation Committee.

Organization of Hindi workshops, Hindi day, Hindi fortnight, Publication of Hindi magazine have been done and Hindi training/staffing incentive scheme has been implemented.

Action taken on various items of Official Language Implementation during the period is as follows:

1. Compliance of Section 3(3): All the papers coming under section 3(3) of the Official Language Act 1963 have been issued bilingual.

2. Compliance of Rule 10: All types of forms, letter heads, Notice/ stamps, Sign boards, name plate, Invitations, Identity Cards, Visiting cards etc are bilingual. Bilingual packs per Secretariat, Railway Recruitment Boards and the concerned officers have been directed to ensure the same bilingual.

3. Hindi correspondence: During the year the prescribed targets for correspondence in Hindi have achieved by sending 90% Official Hindi letters in Hindi to Central Govt. Offices, 60 % Govt. of India Undertakings/Corporations/Boards in Hindi to State Govt. Offices and Individuals of A & B regions.

4. Organizational meetings on the Official Language Implementation Committee: The progress of implementation of the Official Language was reviewed from time to time by conducting OLIC meeting in every quarter. During the year 2016-17 Official Language Implementation Committee meetings were organized on 11.06.2016, 30.09.2016, 28.12.2016 and 28.03.2017 in which the action was taken on the decisions of the meeting.

5. Organization of Hindi Workshops: Hindi workshop was organized in every quarter for the officers of the Institute to provide information as to use of Hindi in the official work and related information about Official Language Policy. During the year, 14 officers and 44 staff have been trained in Hindi and computer applications.

[illegible] separately for scientific and administrative officials and scientists.

6. **Implementation of Hindi-drafting incentive scheme:** To encourage the officers and staff of the institute and its subordinate offices to do their work originally in Hindi, [illegible] incentive scheme was implemented in which cash awards are given for writing prescribed words in Hindi.

7. **Publications in Hindi:** Annual report of the institute was published [illegible] bilingual [illegible] bilingual. Half yearly house magazine [illegible] was released.

8. **Use of Hindi in Scientific Work:** During the year some of the Scientists prepared research papers and articles originally in Hindi and they were published in [illegible] magazine [illegible].

9. **Notification of the sub-ordinate offices under 10(4) of the Official Language Rules:** The offices in which 80% of the staff have working knowledge in Hindi are notified under 10(4) of the official language rules. In this direction, apart from this office, 4 subordinate offices have also been notified.

10. **Organisation of Hindi competitions:** Official Language fortnight was organised from [illegible] during which [illegible] different Hindi competitions viz. 1. correct writing, 2. dictation, 3. memory test, 4. group discussion, 5. [illegible], 6. [illegible], 7. Technical glossary, 8. Songs, 9. [illegible] were organised. The winners of the competitions were awarded with first, second, third and consolation prizes.

11. **Work on computers in Hindi:** [illegible] Section 3(3), forms, [illegible] quarterly progress report [illegible] computers. Unicode system [illegible] on computers which facilitates to do work in Hindi, English and other Indian languages.

MULBERRY BREEDING AND GENETICS LABORATORY

Concluded Research Project:

All India Coordinated Experimental Trial for Mulberry [illegible]

Regional Coordinator: [illegible]

[illegible]

[illegible]

Objective: To identify and authorize suitable mulberry varieties for commercial use in different agroclimatic mulberry cultivation zones of India

The experiment was laid out [illegible]

[illegible]

[illegible]

the check varieties. Moreover, incidence of bore and root knot diseases were reported in all the varieties. Rooting was highest in Lucca (97%) followed by Jayanthi (>42.5%) and Jet (72.5%).

Bulk Analysis: Leaf area (sq cm/harvest) recorded was significantly higher in Lucca Local followed by Jet (sq cm) and Suguna (sq cm) than the local check. In (2019), value 0.5000 and 0.4 significantly proved higher than the national check Vikram (sq cm). Number of leaves per metre length (pl.), moisture retention capacity (%) of the leaves were significantly higher in Jet, while leaf weight was also significantly higher in Jet (%) followed by Lucca (%). The shoot length was significantly higher in Lucca and Jayanthi over the national check. The leaves characteristics like chlorophyll were significantly higher in Jet over national check. Diseases, like leaves and shoot percentage was significantly superior in Jet over Lucca. The incidence of major foliar pest and diseases also recorded. Rooting was highest in Jet (87.5%) followed by Jayanthi (%) and Suguna (%).

Bulk Analysis: The variety Jet proved significantly higher (%) over the national (%) and local check varieties. The total shoot weight (kg/plant) as well as per metre length (kg/m) of the variety were significantly higher than the check varieties. Jet per hectare (%) and the number of leaves harvested (leaves) of Jet was on par with check varieties. Leaves yield was significantly higher in Suguna (%) followed by Jet (%) over the check variety. In Jet, the leaves yield and shoot percentage were significantly higher in Suguna and Jet over national check and on par with the local check. Incidence of bore and root was recorded (%) in the test varieties, while no incidence of major pests and diseases were recorded. The rooting was highest in Jet (%) followed by Jayanthi (%) and Suguna (%).

Bulk Analysis: Significantly higher leaf area (sq cm/harvest) was recorded in Jet (%) followed by Lucca (%) over Vikram (%) and Raj significantly compared to (%). Jet recorded significantly higher values for total shoot length (cm) (%) and no. of shoots per metre length (%). Moisture content (%) and moisture retention capacity (%) over the national check. The leaves characteristics such as leaves yield (kg/ha), single leaves wt. (%) g and single shoot wt. (%) g were significantly higher in Jet and the national and local check varieties, whilst the other characters were at par with national and check varieties. No incidence of major foliar pests and diseases were recorded during the crop. Highest rooting was recorded in Jet (%) followed by (%) and Suguna (%).

Bulk Analysis: At the three leaf, all foliar characters significantly higher leaf area over both national and local checks. Jet recorded significantly higher yield contributing parameters like total shoot length/plant (%) cm, no. of shoots per metre length (pl./m), moisture retention capacity (%) over national check (%) and local check (%). Rest of the economic characters of leaves like of leaves harvested (%) leaves, leaves yield, single leaves wt., single plant wt. and leaves content were significantly higher in Jet over the national and local check varieties. Maximum incidence of bore disease (%) - (%) was recorded in test varieties than the check varieties (%) – (%). Rooting was highest in Jet (%) followed by Jayanthi (%) and Suguna (%).

Growth & Asset Performance of Industrial Undertakings—A Study of Profits

Industry	Total gross fixed assets (Rs. lakhs)	No. of factories with gross fixed assets	Total net value added (Rs. lakhs)	Labour productivity (Rs. lakhs)	Capital employed (Net fixed assets + working capital) (Rs. lakhs)	Profit before tax (Rs. lakhs)	Profit after tax (Rs. lakhs)	Net profit as % of capital employed
Chemicals								
Cement	1,245,678	1,234	456,789	3,698	1,567,890	345,678	234,567	14.96
Steel	2,345,890	1,876	678,901	3,612	2,789,456	456,789	312,345	11.17
Petrochemicals	1,567,234	1,456	534,678	3,671	1,923,567	389,012	267,890	13.92
Fertilizers	1,234,567	1,123	412,345	3,672	1,678,901	312,456	213,678	12.73
Oil & Gas	2,456,789	1,987	789,012	3,971	3,123,456	567,890	389,012	12.45
Coal & Lignite	987,654	1,345	312,678	2,324	1,234,567	198,765	134,890	10.93
Power Generation	3,456,789	2,134	1,234,567	5,784	4,567,890	678,901	456,789	9.99
Electronics & Telecommunications								
Electronics	1,345,678	1,567	567,890	3,623	1,789,012	389,456	267,890	14.97
Telecom	2,678,901	1,234	1,123,456	9,107	3,456,789	789,012	534,678	15.47
Computer Hardware	1,234,567	1,456	678,901	4,661	1,567,890	345,678	234,567	14.97
Software	1,789,012	1,678	1,012,345	6,035	2,123,456	567,890	389,012	18.32
IT Services	2,345,678	1,890	1,345,678	7,120	2,678,901	678,901	456,789	17.06
Consumer Electronics	987,654	1,234	456,789	3,702	1,123,456	267,890	178,901	15.92
Semiconductors	1,567,890	1,345	789,012	5,866	1,789,012	456,789	312,345	17.46
Automobiles & Auto Components								
Passenger Cars	2,345,678	1,567	789,012	5,035	2,678,901	534,678	367,890	13.73
Two Wheelers	1,678,901	1,890	567,890	3,006	1,789,012	389,456	267,890	14.97
Commercial Vehicles	1,234,567	1,345	456,789	3,397	1,456,789	312,456	213,678	14.67
Tractors	1,456,789	1,678	534,678	3,187	1,567,890	345,678	234,567	14.97
Auto Components	1,890,123	2,345	678,901	2,894	2,123,456	456,789	312,345	14.71
Tyres & Rubber	1,123,456	1,234	456,789	3,702	1,234,567	267,890	178,901	14.49
Textiles & Apparel								
Cotton Textiles	1,567,890	1,890	567,890	3,006	1,789,012	345,678	234,567	13.11
Synthetic Textiles	1,234,567	1,456	456,789	3,138	1,456,789	312,456	213,678	14.67
Garments	987,654	1,678	345,678	2,060	1,123,456	234,567	156,789	13.96
Jute Textiles	456,789	1,234	123,456	1,000	567,890	89,012	56,789	9.99
Woollen Textiles	678,901	1,345	178,901	1,330	789,012	123,456	78,901	9.99
Food Processing								
Sugar	2,345,678	1,890	567,890	3,006	2,678,901	456,789	312,345	11.66
Edible Oils	1,678,901	1,567	456,789	2,916	1,789,012	345,678	234,567	13.11
Dairy Products	1,234,567	1,678	345,678	2,060	1,456,789	267,890	178,901	12.28
Beverages	1,890,123	1,456	567,890	3,900	2,123,456	456,789	312,345	14.71
Tobacco Products	2,456,789	1,234	789,012	6,392	2,678,901	678,901	456,789	17.06
Total	45,678,901	38,456	14,567,890	3,789	52,345,678	11,234,567	7,890,123	15.08
Median	1,678,901	1,567	567,890	3,702	1,789,012	389,456	267,890	14.67

Name	Value of Asset (Cost) Purchase	No. of Depreciation months in Year of Sale	Depreciation for the year	Total Depreciation upto the year	Net Block (WDV)	Profit/ Loss on Sale	Gain/ Loss to be taxed	Total gain/ loss to be taxed
(A) Unsecured								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
(B) Secured								
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Statement of Profit and Loss for the year ended 31st March

Particulars	Note No.	Figures for the current reporting period (₹)	Figures for the previous reporting period (₹)
Income			
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
Expenses			
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]						
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]						
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]						
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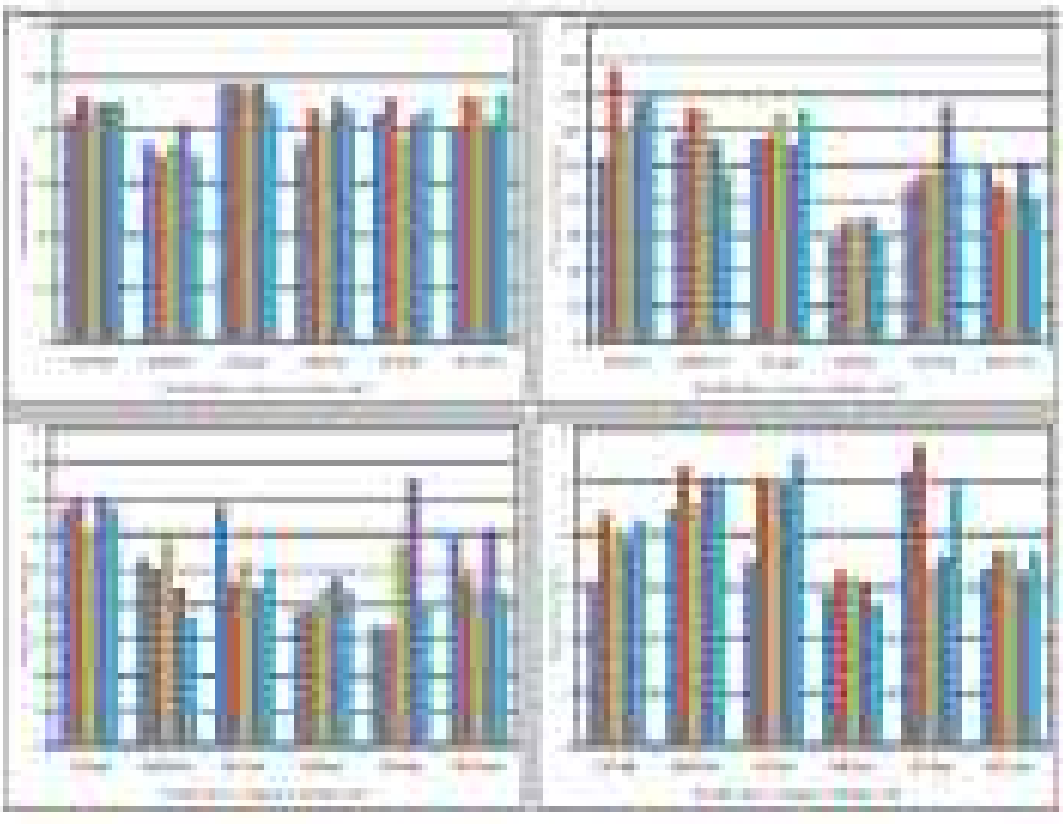
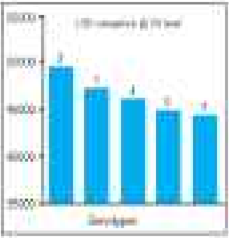
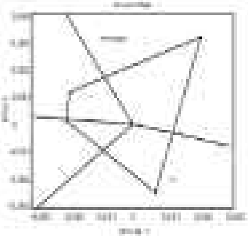
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]







Ongoing Research Projects

[illegible] [illegible] (Jan. [illegible] – Dec. [illegible])

[illegible]

Objectives: [illegible]

[illegible]

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Grand mean	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PIP 3555: Identification of indices for abiotic stress tolerance in mulberry and their influence on nutrition and [illegible] (Oct. 2016 - Sept. 2019)

[illegible], [illegible], [illegible] and [illegible]

Objective: To identify physiological and biochemical indices of abiotic stress tolerance in mulberry

Biochemical Analysis of Different Mulberry Genotypes under Optimal Conditions

Variety	SOD (units/g)	POD (units/g)	Phenols (mg/g)	Ascorbic acid (mg/g)	Reduced GSH (mg/g)	Proline (µmoles/g)	Soluble Sugar (mg/g)
V1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Biochemical assays of [illegible] mulberry genotypes was carried out for estimating the levels of antioxidant enzymes (superoxide dismutase (SOD), peroxidase (POX)), non-enzymatic antioxidants (phenols, ascorbic acid & reduced glutathione) and osmolytes (proline & soluble sugars) under optimal conditions. Highest superoxide dismutase activity (units/g) was recorded in [illegible] and [illegible], and maximum peroxidase activity (units/g) recorded in [illegible]. [illegible] antioxidants and osmolytes [illegible] phenols [illegible] mg/g, ascorbic acid [illegible] mg/g, reduced glutathione [illegible] mg/g, proline [illegible] µmoles/g, soluble sugars [illegible] mg/g.

PIB 3551 (PPV & FRA Phase III): Development of Distinctness, Uniformity and Stability (DUS) descriptors for Mulberry (*Morus* spp.) and their validation (Apr. 2015 - Mar. 2018)

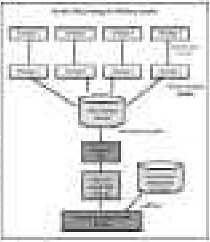
[illegible], V. Girish Naik and [illegible] (PPF)

Objectives:

- Development of database for the mulberry DUS descriptors [illegible]
- Establishment and maintenance of example and reference varieties
- Establishment of [illegible] DUS test centre at CSRTI [illegible]
- DUS testing of new/ extant varieties and their registration under PPV & FR Act, 2001

A Task Force meeting was organized on [illegible] at CSRTI Mysuru and the committee approved the DUS test guidelines for mulberry after incorporating the suggestions/modifications. The DUS test guidelines was notified by



[illegible] for soil samples (0-15 depth) in agricultural fields of [illegible] and [illegible] districts. Processing and characterization of fungal isolates based on morphological characters and molecular identification. Soil fungal gene sequences and the sequences were deposited in NCBI database under GenBank accession numbers [illegible], [illegible], [illegible], [illegible], [illegible], [illegible], [illegible], [illegible], [illegible], [illegible].

Continuing/Ongoing Activities

Maintenance of mapping materials

- [illegible] and yield monitoring plots (Hybrid Cotton - 10, progeny - [illegible])
- [illegible] and efficiency (Hybrid Maize - [illegible], 3 progeny - 200 [illegible] Hybrid Cotton progeny - 40 [illegible] and Cotton progeny - [illegible])
- Seed test (Cotton Hybrid - 25 progeny - 1000 Kg, Fungicide and Chemicals progeny - 25 Kg)
- Adaptive Research (Cotton - 3 x 10 progeny - [illegible])
- Intercropping (Hybrid Maize and Cotton - 20 Kg)
- Maintenance of Hybrid and Parental Lines ([illegible])

SOIL SCIENCE & CHEMISTRY

Continuing/Other Activities:

PPG 0000 - Soil health cards for Cultivators farmers in Block of [illegible], Tamil Nadu, Andhra Pradesh, Telangana, Kerala, Maharashtra and Madhya Pradesh (Apr. 0000 - Mar. 0000)

[illegible], [illegible], [illegible], [illegible], [illegible] + [illegible] [illegible] & [illegible]

[illegible], [illegible], [illegible], [illegible], [illegible], [illegible]

Objectives: To create the farmers aware about the importance of soil fertility on the production of quality mulberry leaves by adoption of soil health cards.

Soil fertility plays an important role in quality mulberry leaf production. Imbalance use of fertilizers, over application of organic manure and non-replacement of depleted micro and secondary nutrients over the years, has resulted in decrease in soil fertility, unbalanced nutrient management leading and the lowest productivities of farmers. Looking to the above, government of Tamil Nadu and Andhra Pradesh has taken up the concept of soil fertility mapping and issuing soil health cards to the farmers. Soil testing is conducted to determine the status of soil with respect to pH, EC, OC, P, K, Ca, Mg, Zn, Fe, Cu, Mn, B and details of the results, the fertilizer recommendations and soil amendments to be undertaken are recommended for the farmers. [illegible] Mulberry growers having soil health cards [illegible] in 5 years for the sericulture farmers in Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Kerala, Maharashtra and Madhya Pradesh. The soil testing should be conducted at the main institute and also to intercropping, research and seven [illegible] soil sampling points collected from agriculture farmers of Karnataka, Tamil Nadu, Andhra Pradesh,

Critical Levels of Soil Parameters for Mulberry			
pH	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

Telangana, Kerala, Uttarakhand and Madhya Pradesh in descending order (Table 2). These soil samples were analyzed for pH, electrical conductivity, organic carbon, available N, P, and micronutrients (Zn, Fe, Mn, Cu, B). Electrical conductivity was determined using a conductivity meter (Jackson, 1973) and pH was measured by Madhya Pradesh (8.5) and Karnataka (8.2%). Both crucial samples analyzed were of neutral range in Karnataka. The result for conductivity of most of the soils (>0%) in all the states were under the normal range. More than 70% of the soils in the study districts are low in organic carbon content (<0.5%) and maximum in Andhra Pradesh (54%) followed by Karnataka (13%), Maharashtra (10%) and Tamil Nadu (3%).

State	Samples Analysed	Soil Fertility Index of							
		OC			N			P	
		deficient	sufficient	adequate	Low	Medium	High	Deficient	sufficient
Kar.	1000	3	480	517	384	2	614	386	0
TN	1000	3	187	810	191	7	802	217	0
AP	1000	3	61	936	1000	0	000	211	0
MP	1000		260	2	262	0	738	264	0
MH	1000	10	100	900	1000		000	000	0

The status of available N (kg/ha) in the same districts was 100 kg/ha in low category, 101-280 kg/ha in medium and >280 kg/ha in high category. The soils of Andhra Pradesh (62%), Tamil Nadu (26%) and Karnataka (7%) are under low category. Nearly 90% of soil samples analysed in Karnataka, Tamil Nadu and Andhra Pradesh are low in available phosphorus (<23 kg/ha) whereas most of the soils of Maharashtra and Madhya Pradesh comes under moderate to sufficient category, with regard to this nutrient. Most of the soils have responses to sufficient fertilizers. Soils with sufficient level of available K are observed maximum in Maharashtra (62%) followed by Andhra Pradesh (62%), Tamil Nadu (13%) Karnataka & Madhya Pradesh (8%). The status of available sulphur was low (<10% in soil (), 21-10% in moderate (m), >10 ppm in sufficient (S) category. Maximum sulphur deficiency was observed in Madhya Pradesh (20%) followed by Andhra Pradesh (10%), Maharashtra (7%) and Karnataka (3%).

Micro Nutrients	Samples
Mn	31
Cu	0
Fe	4
Zn	15
B	22
Mn+Cu	21
Mn+Fe	146
Cu+Fe	40

Micronutrients analysis showed that most of the soils in Tamil Nadu and Andhra Pradesh were sufficient in micronutrients whereas Maharashtra soils were low in micronutrients. Micronutrients analysed in these soils showed that Mn was sufficient in 31% soils followed by Cu (0%), Fe (4%), Zn (15%) and B (22%). Mn and Fe were found in 146 (14.6 percent) soils followed by Andhra Pradesh (40%) and Karnataka (40%). Mn and Fe also follow the same trend. The highest sufficiency of Zn and Mn was observed in Telangana (65% & 31%) followed by Andhra Pradesh (40% & 15%) and Karnataka (15% & 40%) respectively. In the soils of Maharashtra showed sufficient zinc (0%).

Status of Available N, P, K, S & B

State	No. of Samples Analysed	Available N			Available P			Available K			Available S			Available B		
		L	M	H	L	M	H	L	M	H	L	M	H	L	M	H
Kar.	1000	76	23	1	87	13	0.1	1	92	100	28	17	97	100	49	51
TN	1000	62	38	0	97	28	7	1	29	70	22	20	80	77	31	0
AP	1000	90	10	0	10	90	23	1	12	87	90	10	100	97	23	12
MH	1000	61	39	0	100	49	21	0	92	100	27	73	93	100	11	39
MP	1000	92	27	0	0	100	3	1	12	100	94	30	120	100	49	51

The soil analysis in the mulberry growing areas are helpful to assess the soil reaction, due to moderate fluctuations, such as available P and potash levels of the soil, with respect to micronutrient status, the soils are sufficient in Zn, Mn and Cu, whereas Fe is sufficient in the soils. Based on the soil test results, recommendations of manures and fertilizers were given to the farmers to maintain the soil health and fertility.

Continuous Extract Assessment

Quality Testing of disinfectants and insecticides used in sericulture

The disinfectants, critical inputs in sericulture of mulberry silkworm are more important for assuring the cleanliness of sericulture industry by assessing the quality norms.

Out of [illegible] samples were found moderately suitable for irrigation purposes in [illegible] cases and 5 samples were not suitable. Dicofol formulation [illegible] was detected in 23 samples amongst various formulations. Acaricide residues [illegible] were recorded in [illegible] water samples which indicates contents of residues need to be stopped for utilization of the same. Mineral sachets of Vigilex, vitamin supplement, Lactic, Ascorbic and Palmitic were evaluated for active ingredients content as per quality norms and pH values were found accordingly. An amount of Rs.7.047 lakhs were collected towards testing charges.

RESEARCH SECTION

Ongoing Research Projects

PROJECT: Development of Technology for Production of Organic Silk [Jan. 2010 - Dec. 2012]

Principal PI[illegible] Co-Investigators [illegible], PC [illegible], M. Ramesh Assistant [illegible] Dec 2010 and field staff

Objectives:

- To produce the mulberry leaf and cocoon through organic
- To study the rearing parameters in organic silk
- To conduct the economics for production of organic silk

The experimental plots were complied with the recommended mulberry cultivation practices including organic cultivation. Soil samples collected from the experimental plots assigned for organic [illegible] and inorganic treatments [illegible] were analyzed and data was recorded. The samples were also sent to the identified agencies for organic certification analysis [illegible]. The leaf yield in the plots was collected for the second purpose and samples for leaf biochemical and data on rearing performance and economic parameters were recorded. The silkworm crop protection measures practiced, viz., soil and water sanitation, disinfectants and safe to the pre-requisite basis [illegible] for effective phase in disease management. The rearing and further process was conducted by recommended methods under shelf and rearing appliances.

Soil Chemical Properties - Organic Cultivation

[illegible]	pH	EC (mmhos/cm)	OC (%)	P (kg/ha)	K (kg/ha)	Cu (ppm)	Zn (ppm)	Mn (ppm)	Fe (ppm)
T1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
T2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
SE	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CD (P=5%)	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PIN 3640: Carbon sequestration in mulberry cultivation and strategies to enhance carbon sequestration (Jan. 2018 - Dec. 2019)

[illegible]

Objectives:

- Assessment of carbon sequestration efficiency of mulberry cultivars under irrigated condition
- To develop strategies to enhance carbon sequestration in irrigated mulberry plantation

[illegible]

Soil analysis										
				Available		Microbial Population (CFU/g soil)				
Plot	pH	[illegible]	OC (%)	P (kg/ha)	K (kg/ha)	Fungi	Bacteria	Actinomycetes	Azotobacter	
Treated	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Control	7	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	

Mulberry Leaf Yield Data					
Plot	Av. Plant Height (cm)	Av. Length of Longest Shoot (cm)	Lateral Shoot (No.)	Branches (No.)	Leaf Yield (kg/ha/crop)
Treated	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Control	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

PIN 3240: Evaluation of modified spacing with special reference to planting geometry for sustainable mulberry leaf production (Jan. 2018 - Dec. 2019)

[illegible]

Objective: Identification of appropriate planting geometry for facilitating mechanization and quality mulberry leaf production

[illegible]

MYCOLOGY INVESTIGATIONS

Completed research Projects

PRP (E28) Development of a broad spectrum formulation for effective management of mulberry root rot disease (Oct. 2006 – Dec. 2010)

P.I.: [illegible] Co-P.I.: [illegible] (upto February 2011)

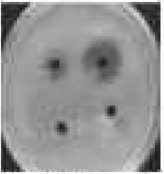
Objective: To develop a broad spectrum formulation for effective management of root rot disease of mulberry

In vitro screening for antifungal activity against fungi that associated Pathogens of Mulberry

The root rot associated pathogens of mulberry viz., Rhizoctonia bataticola, Fusarium oxysporum, F. solani and Sclerotium rolfsii Sacc. were subjected to in vitro screening of extracts of 11 plant species. 14 alternative fungicides and 10 fungicides was conducted for antifungal activity in solid and liquid media. The plant species, Allium sativum, Strychnos potatorum and Azadirachta indica were highly effective in suppressing the fungi responsible for root rot in terms of radial growth. Among the fungicides, Carbendazim and Mancozeb completely suppressed R. bataticola, F. oxysporum and F. solani and Hexaconazole and Propiconazole at 0.1% concentration and Carbendazim, Mancozeb and Propiconazole at 0.2% concentration completely suppressed the growth of all the pathogens. Trichoderma viride, Trichoderma harzianum and Bacillus subtilis in case of alternative fungicides, complete fungal suppression exhibit at 4% concentration was observed in presence of Trichoderma viride (TCA) treatments also and recommended. The effectiveness of bio fungicide from each group (plant extracts, alternative fungicides, fungicides) was evaluated for their most effective concentration in antifungal activity. The identified plant extracts (3%) and alternative fungicides (4%) as fungicides (100%) effectively controlled root rot disease fungi.

Plant species	Radial growth (mm)			
	R. bataticola	F. oxysporum	F. solani	R. bataticola
Allium sativum	0.00	0.00	0.00	0.00
Azadirachta indica	25.00	15.00	20.00	15.00
Strychnos potatorum	0.00	0.00	0.00	54.00
Lawsonia inermis	0.00	0.00	0.00	0.00
Calotropis gigantea	11.00	10.00	15.00	10.00
Ocimum basilicum	0.00	0.00	0.00	0.00
Jatropha curcas	0.00	0.00	0.00	0.00
Cymbopogon citratus	0.00	0.00	0.00	0.00
Azadirachta indica	0.00	0.00	0.00	0.00
Phyllanthus niruri	0.00	0.00	0.00	0.00
Control	90.00	90.00	90.00	90.00
CD (P=0.05)	0.00	0.00	0.00	0.00
Fungicides				
Hexaconazole	0.00	0.00	0.00	0.00
Propiconazole	0.00	0.00	0.00	0.00
Difenoconazole	0.00	0.00	0.00	0.00
Validamycin	0.00	0.00	0.00	0.00
Thiophanate methyl	0.00	0.00	0.00	0.00
Carbendazim	0.00	0.00	0.00	0.00
Carbendazim+Mancozeb	0.00	0.00	0.00	0.00
Tebuconazole+Trifloxystrobin	0.00	0.00	0.00	0.00
Control	90.00	90.00	90.00	90.00
CD (P=0.05)	0.00	0.00	0.00	0.00
Alternative fungicides (Commercial)				
Bacillus subtilis	0.00	0.00	0.00	0.00
Trichoderma viride	0.00	0.00	0.00	0.00
Pseudomonas fluorescens	0.00	0.00	0.00	0.00
Trichoderma harzianum	0.00	0.00	0.00	0.00
Control	90.00	90.00	90.00	90.00
CD (P=0.05)	0.00	0.00	0.00	0.00

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CD (P≤0.05)	[illegible]	[illegible]	[illegible]	[illegible]



Effect of different formulations on rotting & wilting of mulberry		
Formulation	Rotting (%)	Wilting (%)
[illegible]	[illegible]	[illegible]
F1	[illegible]	[illegible]
F2	[illegible]	[illegible]
F3	[illegible]	[illegible]
F4	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
CD (P≤0.05)	[illegible]	[illegible]
[illegible]		

[illegible]				
[illegible]	[illegible]		[illegible]	
	Treat	Ctrl	Treat	Ctrl
1	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	[illegible]	[illegible]	[illegible]
Mean	[illegible]	[illegible]	[illegible]	[illegible]
T-test	[illegible]		[illegible]	

Evaluation under simulated conditions

Five formulations were evaluated with [illegible] effective substances, [illegible] fungicides and fungicides [illegible] plants grown in earthen pots under artificial simulation of root rot disease. Five replications were maintained against each combination and control. Untreated plants and plants treated with existing recommendation, [illegible] were maintained for comparison. The formulation, F1 was highly effective and controlled [illegible] root rot and [illegible] wilt in comparison to [illegible] ([illegible] and [illegible], respectively). The most effective formulation for [illegible] root rot in mulberry was named as [illegible].

In situ evaluation of effective formulations in farmers' areas

The effectiveness of [illegible] has been evaluated in various [illegible] areas of [illegible]. The [illegible] after application of the formulation and [illegible] was effective in reducing the disease severity and reduced the root rot affected plants by [illegible] of the [illegible] fields. In all the areas, the spread of the disease was controlled considerably and farmers were able to [illegible] without any [illegible] from the root rot affected gardens. [illegible] did not show any [illegible] effects on growth and development of [illegible] and mulberry plants. [illegible] did not show significant variation with regard to soil microbial populations as compared to [illegible] soils.

[illegible] organised in the farmers' [illegible] held on [illegible] at [illegible], [illegible] and [illegible]. Technical pamphlets have been published in [illegible] and English.

PIP Activity: Recommendation of mulberry accessions for management of root knot disease in mulberry (Kharif 2012 - Rabi 2017)

I. Sunitha Bai, Lydia Mary (RSRS), P.M. Parthasarathy Reddy, K. Jayaveera, T. Rajkumar, G. A. Ravishankar/
Mysore, Hosur, Kodathi, Thrissur, Kalimpur

Objectives:

- To develop an entomopathogenic nematode for application and commercial production of formulation
- To demonstrate effective crop protection through integration for management of root knot disease
- To popularize the product among sericulturists

Nemplant is an eco-friendly formulation developed for the management of root knot disease (mycotrophy caused by meloidogyne incognita). As a part of farmers' popularization programme, large-scale field evaluation studies were conducted in Karnataka, Andhra Pradesh and Tamil Nadu. Mild to severe incidence of root knot disease results in stunted growth and reduce leaf yield.

Field Trial at Chamrajnagar			
Plants	Treatment (g)	Larvae (No/g)	Nematode (J2/kg)
T1	1000	12	81
T2	1500	08	72
T3	2000	04	51
Total	4500	1.23	3.27

Nemplant was distributed and demonstrated to the farmers for application in the infected fields (1000kg/10 acres each field infected mulberry gardens (27 farmers)). The data was collected from the treated and untreated plots three months after application of Nemplant. Treated plots showed significant (P<0.05) reduction of root knot due to the application of Nemplant while 48.63% greater growth over the untreated control plants. Similarly, significantly higher mean leaf yield (21% higher) was recorded with the application of Nemplant (18.42% increase) over untreated plants.

Effect of Nemplant for the Control of Root Knot & Mulberry Yield						
Plots	No. of Galls/ Kg roots		Leaf Yield (kg/ plant)		Higher Leaf Yield (%)	Leaf increase (%)
	Treated	Control	Treated	Control	Treated	Control
AP	1.28 (20.2)	4.70 (43.49)	3.51 (27.77)	2.90 (21.85)	18.47 (25.38)	24.07 (29.38)
TN	1.51 (19.01)	5.31 (43.17)	3.58 (27.75)	2.90 (21.85)	19.11 (25.93)	18.94 (25.67)
KA	1.28 (19.47)	4.90 (43.89)	3.57 (27.68)	2.93 (21.87)	18.04 (25.47)	17.92 (25.08)
Overall	1.36 (20.00)	5.00 (43.85)	3.55 (27.73)	2.91 (21.86)	18.54 (25.59)	19.64 (26.04)

Technical programme on commercial scale been published in Malayalam, Telugu, Tamil, Hindi and English and circulated to the farmers for wider popularization. Nemplant has been commercialized by M/S. Parthasarathy Agri Clinic Hosur (TN), Malappa Enterprises (KAR).

MULBERRY PHYSIOLOGY

Plant Physiology

Efficacy of antitranspirants on nutritional efficiency and mulberry productivity under rainfed irrigation condition (Feb. 2012 to Dec. 2017)

M.N. Sastry, Chandrakanth and K.C. Narasimhanna Reddy

Objectives: - To identify suitable antitranspirants for improving moisture retention capacity and productivity under rainfed irrigation

The pilot project did not make substantial progress, as no significant results were recorded from the two crops.

DIRECTORATE OF SEED RESEARCH

Commodity Projects

AICRP(S): Development of new bloomless silkworm hybrids for commercial exploitation (Silks: PT - Pvt CT)

Coordinating Scientist, Dr. Vinay Kumar, and Scientist-in-Charge

Objectives: To develop improved silkworm hybrids for sustainable silk production

Silkworm breeding lines developed by different sericulture institutions for productivity, silk quality, disease, stress and thermo tolerance were screened for understanding single cocoon commercial viability test to develop new silkworm hybrids. Association analysis (cocoon & filament trait), single hybrid cocoon parameters (single hybrid cocoon weight, cocoon shell weight, cocoon length, cocoon width, shell ratio, filament length, denier & renditta) and cocoon yield parameters (deposited cocoon weight, single cocoon yield, effective rate of rearing, yield per 10000 larvae) were evaluated and promising seven hybrid combinations were selected based on overall performance with respect to important economic traits.

Eleven male breeders (CSR2, CSR27, CSR50, CSR58, CSR60, CB, NB4, SK, NB18, SC & BV) and thirteen female breeders (CSR4, CSR6, CSR13, CSR20, CSR21, CSR25, 4E, 4F, SK, SK1, CSR27, RAVIS & PM4R-17) were used for the hybrid evaluation study [24 single hybrids of bivoltine crosses (not a commercial) were evaluated under uniform rearing conditions. Based on survival and quantitative cocoon traits, 10 productive and 2 robust single hybrids were shortlisted. Further, these shortlisted hybrids were evaluated to study their stability in different seasons. The bivoltine hybrids, CSR2 x CSR27, CSR58 x CSR27 and CSR60 x CSR27 for productivity and CSR13 x CSR27 for robustness were identified as promising combinations on the basis of ecovalence index (Si) across six crop to recommend uniformity and better qualitative parameters and recommended for DPCSA use.

Rearing and Breeding Performance of Shortlisted Productive Bivoltine Single Hybrids

Hybrids	Shell Ratio (%)		No. of Cocoons (No.)	Single Cocoon Weight (g)	Shell Weight (g)	Effective Rate of Rearing (%)	Filament Length (m)	Renditta	Pupation Rate (%)	Cocoon Yield (kg)	Denier (d)
	Mean	SE (±)	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean	Mean
CSR2 x CSR27	20.01	0.19	1,450	1,698	21.5	82.7	1,410	1.84	98.4	98.7	2.1
CSR58 x CSR27	20.05	0.16	1,480	1,705	21.6	87.7	1,500	1.92	98.3	99.0	2.0
CSR60 x CSR27	19.93	0.08	1,510	1,715	21.5	89.7	1,520	1.95	98.5	99.2	2.0
CSR4 x CSR27	20.01	0.17	1,490	1,710	21.5	91.1	1,500	1.91	98.1	99.3	2.0
CSR6 x CSR27	19.92	0.18	1,490	1,707	21.5	92.1	1,517	1.93	98.3	99.3	2.0
CSR13 x CSR27	19.93	0.15	1,500	1,702	21.5	92.3	1,502	1.94	98.5	99.5	2.0
CSR20 x CSR27	19.93	0.16	1,510	1,705	21.5	92.5	1,500	1.93	98.3	99.5	2.0
CSR21 x CSR27	19.92	0.18	1,507	1,709	21.5	94.2	1,501	1.93	98.1	99.5	2.0
CSR25 x CSR27	19.91	0.17	1,517	1,707	21.5	95.0	1,500	1.93	98.2	99.6	2.0
4E x CSR27	19.90	0.16	1,520	1,710	21.5	96.4	1,505	1.93	98.3	99.6	2.0
4F x CSR27	19.91	0.16	1,520	1,705	21.5	96.5	1,500	1.93	98.3	99.7	2.0
SK x CSR27	19.92	0.17	1,520	1,705	21.5	96.5	1,500	1.93	98.3	99.7	2.0

Bold: Hybrids Exceeded CD(5%) of All-10 Hybrid Mean (CD)

Heading and reading performance of coordinate based assembly single systems

[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]

By integrating plasma derived extracellular [illegible] (cyan blue) and [illegible] (vermilion) formation values were prepared and evaluated. On the basis of survival as a qualitative factor data, providing over and survival [illegible] were combined for further accurate rapid [illegible] (AD) model hybrid one [illegible] complex [illegible]. These hybrid were evaluated under various conditions to identify the promising combinations on the basis of quantitative and qualitative data. All prepared and characterized hybrid were monitored to study the stability in different [illegible]. Model and evaluation data [illegible] as well as [illegible] efficacy with better quantitative characteristics. [illegible] hybrids [illegible] [illegible] by [illegible] and [illegible] hybrids [illegible] [illegible] [illegible] were selected as promising [illegible] for [illegible] to identify the less [illegible] [illegible].

Heading and reading performance of [illegible] [illegible] [illegible] [illegible]

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Yield performance and seeding performance of seven released hybrids in coordinated trials

Hybrids	Yield (kg/ha)		Days to 50% flowering	Plant height (cm)	Ear height (cm)	Root lodging (%)	Stalk lodging (%)	Husk cover	Ear length (cm)	Ear girth (cm)	Grain type	Kernel row no.
	Mean	Increase over check (%)										
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

(a) Performance of early hybrids in station trials

Hybrid	Location	Year	Yield (kg/ha)	Yield gain over check (%)	Days to 50% flowering	Plant height (cm)	Ear height (cm)	Plant aspect (1-5)	Ear length (cm)	Lodging (%)	Remarks	Rust (%)	Turcicum (%)
EHT1	Barwani	2021	6842	14.2	52.4	198.6	92.1	2.1	18.4	3.2	Good	4.1	6.8
	Rajgarh	2021	6518	8.5	53.1	201.3	94.6	2.3	18.1	4.1	Good	5.2	7.4
	Khandwa	2021	6731	11.8	52.8	199.8	93.4	2.2	18.6	3.6	Good	4.6	6.9
	Avg		6697	11.5	52.8	199.9	93.4	2.2	18.4	3.6		4.6	7.0
EHT2	Barwani	2021	6918	15.6	53.0	205.4	96.8	2.4	19.2	2.8	Good	3.8	5.9
	Rajgarh	2021	6604	10.1	53.6	207.1	98.2	2.6	19.0	3.4	Good	4.4	6.6
	Avg		6761	12.8	53.3	206.3	97.5	2.5	19.1	3.1		4.1	6.3
EHT3	Barwani	2021	7012	16.9	52.1	196.2	90.4	2.0	18.1	2.5	Good	3.5	5.4
	Rajgarh	2021	6689	11.2	52.7	198.5	91.7	2.2	18.3	3.0	Good	4.0	6.1
	Avg		6851	14.1	52.4	197.4	91.1	2.1	18.2	2.8		3.8	5.8
EHT4	Barwani	2021	7104	17.8	51.8	194.8	89.6	1.9	17.9	2.2	Good	3.2	5.1
	Rajgarh	2021	6772	12.4	52.3	196.1	90.8	2.1	18.0	2.7	Good	3.7	5.6
	Khandwa	2021	6938	15.1	52.0	195.4	90.2	2.0	17.9	2.4	Good	3.4	5.3
	Avg		7005	15.1	52.0	195.4	90.2	2.0	17.9	2.4		3.4	5.3
EHT5	Barwani	2021	6842	14.2	53.6	208.2	99.1	2.7	19.6	4.6	Good	5.6	7.8
	Rajgarh	2021	6518	8.5	54.2	210.4	100.6	2.9	19.4	5.2	Good	6.2	8.4
	Avg		6680	11.4	53.9	209.3	99.9	2.8	19.5	4.9		5.9	8.1
EHT6	Barwani	2021	6604	10.1	52.4	193.6	88.9	1.8	17.8	2.0	Good	3.0	4.9
	Rajgarh	2021	6271	4.6	52.9	195.2	90.1	2.0	18.0	2.5	Good	3.5	5.4
	Avg		6438	7.4	52.7	194.4	89.5	1.9	17.9	2.3		3.3	5.2
EHT7	Barwani	2021	6689	11.2	53.1	201.8	93.2	2.3	18.7	3.4	Good	4.4	6.7
	Rajgarh	2021	6356	5.8	53.6	203.4	94.5	2.5	18.9	4.0	Good	5.0	7.3
	Khandwa	2021	6522	8.4	53.4	202.6	93.9	2.4	18.8	3.7	Good	4.7	7.0
	Avg		6522	8.4	53.4	202.6	93.9	2.4	18.8	3.7		4.7	7.0
EHT8	Barwani	2021	6438	7.4	52.8	197.2	91.0	2.1	18.2	2.9	Good	3.9	5.8
	Rajgarh	2021	6105	2.1	53.2	198.9	92.3	2.3	18.4	3.5	Good	4.5	6.5
	Avg		6272	4.7	53.0	198.1	91.7	2.2	18.3	3.2		4.2	6.2
EHT9	Barwani	2021	6772	12.4	52.6	194.1	89.2	1.9	17.9	2.3	Good	3.3	5.2
	Rajgarh	2021	6439	7.5	53.0	195.8	90.5	2.1	18.1	2.8	Good	3.8	5.7
	Khandwa	2021	6605	10.1	52.8	195.0	89.9	2.0	18.0	2.6	Good	3.6	5.5
	Avg		6605	10.1	52.8	195.0	89.9	2.0	18.0	2.6		3.6	5.5
EHT10	Barwani	2021	6271	4.6	53.8	204.6	95.4	2.6	19.1	4.2	Good	5.2	7.5
	Rajgarh	2021	5938	-1.0	54.4	206.2	96.8	2.8	19.3	4.8	Good	5.8	8.1
	Khandwa	2021	6104	1.8	54.1	205.4	96.1	2.7	19.2	4.5	Good	5.5	7.8
	Avg		6104	1.8	54.1	205.4	96.1	2.7	19.2	4.5		5.5	7.8

Conclusion

Based on the performance of all seven hybrids over the three locations, the single-cross hybrids EHT3 and EHT7 have been identified as superior hybrids for their consistency and high yielding, respectively. These hybrids are to be further evaluated in the All India Coordinated Maize Improvement Project trials during the next season.

On going Research Projects

AIR 1999: Development of positive thermotolerant (thermo-sensitive genic male sterility) hybrids of Brassica oleracea L. Var.capitata for exploitation of heterosis (Oct. 2014 – Dec. 2018).

S. Vijayakumar, M. Saravanakumar (upto December 2016) and C. Hemantkumar

Objective: Development of productive thermo sensitive genic male sterile lines in Brassica oleracea var. capitata

Twelve breeding lines (viz., CBE15, CBE16, CBE17, CBE18, CBE19, CBE20, CBE21 & CBE22) and testers (CBE23, CBE24, CBE25, CBE26 & CBE27) were developed utilizing recurrent production of sterile genetic stocks and sib-mating (full-sib and sister-brother mating) (SBM) as detailed in 2015. The breeding lines are maintained through sib-mating (full-sib and sister-brother mating) to generate adequate quantity of genetic stocks as well as to study the stability for sterility incidence as per the breeding procedure. Agronomic traits such as days to curd maturity, curd weight, curd diameter, curd compactness, curd yield per plot and TSS (Brix) were recorded from 10 plants and 3 decent hybrids were prepared utilizing the selected genetic stocks and evaluated. Based on the per se performance, CBE22 x CBE26 (single hybrid) and double hybrid, (CBE20 x CBE21) x (CBE26 x CBE25) were identified as most promising. Further experiments are to be conducted to ascertain the hybrids performance in other seasons.

Performance of Brassica oleracea Single hybrids

Hybrids	Days to 50% curd maturity	Curd weight (g)	Curd diameter (cm)	Curd yield per plot (kg)	Total yield per plot (kg)	Curd compactness (1-5)	Curd TSS (°Brix)	Curd colour	Curd shape
CBE22 x CBE26	84.0	1.2	1.250	0.450	10.8	4.0	6.5	4.0	Round
CBE24 x CBE26	83.0	1.1	1.200	0.420	10.1	4.0	6.0	4.0	Round
CBE23 x CBE26	85.0	1.0	1.150	0.400	9.6	4.0	6.0	4.0	Round
CBE20 x CBE21	84.0	1.1	1.200	0.430	10.3	4.0	6.0	4.0	Round
CBE20 x CBE25	85.0	1.1	1.200	0.420	10.1	4.0	6.0	4.0	Round
CBE20 x CBE26	85.0	1.1	1.200	0.420	10.1	4.0	6.0	4.0	Round
CBE22 x CBE21	85.0	1.1	1.200	0.420	10.1	4.0	6.0	4.0	Round

Performance of sterility maintainer lines for sterile CBE22 x CBE26

Hybrids	Days to 50% curd maturity	Curd weight (kg)	Curd diameter (cm)	Curd yield per plot (kg)	Total yield per plot (kg)	Curd compactness (1-5)	Curd TSS (°Brix)	Curd colour	Curd shape
CBE22 (MS) x CBE23 (CMF)	85.0	1.0	1.200	0.420	10.1	4.0	6.0	4.0	Round
CBE22 (MS) x CBE24 (CMF)	84.0	1.0	1.200	0.420	10.1	4.0	6.0	4.0	Round
CBE22 (MS) x CBE25 (CMF)	85.0	1.0	1.200	0.420	10.1	4.0	6.0	4.0	Round
CBE22 (MS) x CBE27 (CMF)	85.0	1.0	1.200	0.420	10.1	4.0	6.0	4.0	Round

All India coordinated project on cassava breeding in India and adjacent tribal areas – Indo-USAID

S. Vijayakumar and S. Manikanda Boopathy

Objectives:

- To develop cassava breed / hybrids with high dry content
- To identify cassava hybrids suitable for cultivation in tribal conditions of Tamil Nadu

Five cassava genotypes (Kent 2, Dr 92 x 2, Dm, H226 and Sm) and two hybrids (CO 1 x H1 x H2 x H3 & Adira 1 x Adira 4) were collected from Tamil Nadu Agricultural University, Coimbatore, Tamil Nadu as part of collaborative research project and tried with Rutgers. The quarantine testing of the imported stocks was conducted following appropriate procedures under the supervision of quarantine department, NBPGR-CRI, Bangalore. The investigations were performed in red lateritic soils as prescribed in the Method Thesaurus agronomic practices. Single row (60cm x 90cm) was used, utilizing the augmented germplasm stocks and indigenous stocks. Row planting programmes including intercropping and hybridization were initiated to develop cassava breeds with high dry content.

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[illegible] efficacy and generate data for their regulatory approval [illegible] Inter-Institutional Collaborative Project with [illegible]

[illegible]

Objective: [illegible] efficacy

[illegible]

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Performance of elite/ IC- resistant genotypes in cycle and control cycle

Material	Condition	Nos.	Yield (1000 L/ ha)	Yield (Q/ ha)	Test Wt. (g)	Shelling (%)	Oil (%)	FFA (mg KOH/ g)	Iodine value	Peroxide value (%)	Protein (%)	Tocopherol (mg/ kg)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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AT 1999 Development of multi-trait advance inbred (BnHBP), BnHBP & BnHBP-1 Hardline tolerant/ early/ [illegible] at Bhubaneshwar, through marker-assisted selection (Sep. 2016 - Aug. 2020)

L. [illegible], L. [illegible], S. [illegible], [illegible], [illegible] and M. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

Objectives:

- Identification of multi-trait inbred lines/ varieties using molecular markers
- Development of multi-trait inbred lines/ varieties through marker-assisted breeding
- [illegible] of identified hybrids at [illegible]

Popular, productive, temperature tolerant and elastic breeding genetic stocks (PT) were evaluated for resistance to BnHBP-1 by pot and inoculation (out of 8 inputs) factors @ 10^6 (Alcohol) 5-6 per 100 larvae. The data on rearing performance and economic traits were recorded for the resistant populations. The resistant populations were subjected to PCR for BnHBP-1 gene/s markers amplification. The BnHBP-1 resistant population stocks (PT) were developed and maintained for further evaluation as per trait desired objectives.

A1.Aqu1. Interactome analysis of adaptors for identification of molecular markers for improvement of pig quality (Sept. 2017 - Aug. 2019)

L. Sukeshi, N. Nik-Zainal, S. Mishra & Mudithy and M.R. Chandrashekar

Objectives:

- To carry out transcriptome analysis of sub-gland vs. ovulatory adaptors levels for identification of markers for pig quality
- To analyze important sub-tissue gene networks in ovulation and selection gene gene and gene protein interaction pathways

Ovulation (ovulation) cloned (SAC & CMC) with superior pig quality and multiparous (PQ & PQM) with inferior pig quality were tested for three generations to develop inbred lines. Tissue samples were collected and stored in liquid nitrogen for further use. The platform and a device for transcriptome analysis have been finalized (e.g. nucleotide annotation, mapping of transcriptome data on reference genome, and assay of various functional annotation of expressed genes significant up- and down-regulated genes, KEGG Pathway analysis). Web-platform for these methods are standardized and genomic information between ovulation and reproductive characters have been validated. Based on literature survey, 78 genes have been identified showing correlation to improve pig quality and the same would be utilized to establish gene-gene and gene-protein interaction pathway.

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Coordinating Officer Activities

Maintenance of breeding stock/germplasm

S. Vidhya, D. M. Ajithan Kumar, S. Jeyakumar Ebenezer, L. Rajendran and L. Parthiban

Objective: To maintain various crop/line specific resources conforming to the original traits characteristics

Production technical reports (18), natural pollinated varieties (11), hybrid parents (breeding lines) (7) and key material seeds (5) were maintained for conservation and evaluation. The varieties released for the farmers were maintained conforming with the original breeder/foundation.

Characteristics of released varieties/ resources

Crop/Type	Name(s)		Year of release	Duration (days)	Yield potential (kg/ha)	Special characters	Area of adaptation	Reaction to pests and diseases	Remarks
Groundnut	CVR-1 CVR-2 CVR-3 CVR-4 CVR-5	CVR-6 CVR-7 CVR-8 CVR-9 CVR-10	Under release	100	2500-3000	High oil content	Rainfed	Resistant to rust and late leaf spot	Under release
Redgram	CORG-1 CORG-2 CORG-3 CORG-4 CORG-5 CORG-6	CORG-7 CORG-8 CO-1 CO-2 VBN-1	1999	180	1500-2000	Wilt resistant	Rainfed	Resistant to wilt	Released
Tree Borne Oilseeds	CORTBO-1 CPTT		Under release	Perennial	2.5 kg/tree/year	Oil content 35%	Rainfed	Resistant to pests	Under release
Sesamum	CORS-1(L) CORS-2(L) CORS-3(L)	CORS-1(B) CORS-2(B)	1997	100	500-600	Tolerant to phyllody	Rainfed	Resistant to phyllody	Released

Transfer of Technology (ToT)

Field testing of new varieties/ released materials

S. Vidhya, D.M. Ajithan Kumar, S. Manivannan Thangaraj, L. Rajendran and L. Parthiban

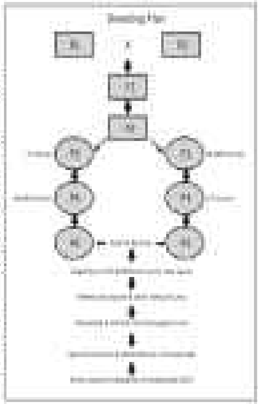
Cotton hybrid (Asymmetrical) CORH2 (CO4) x CORL3 (CO2) is (BC4F3S2) developed by CORI-Vigour, Jassid, Root rot tolerant for delivering the yield potential by environmentally enough GOT programme with the farmers of Kariapatti, Tamil Nadu and Andhra Pradesh.

Details	Yield (kg/ha)	Increase (%) over	Total cost of cultivation (Rs/ha)
Cotton hybrid			
Coimbatore	2500	20	27.5
Tamil Nadu	2400	15	25.5
Andhra Pradesh	2700	5	30.5
Total Area	45000	200	75.0
Check Variety			
Coimbatore	2000	0	25.5
Tamil Nadu	2100	0	23.5
Andhra Pradesh	2600	0	28.5
Total Area	2100	0	25.5

MULTIVOLTINE BREEDING LABORATORY

Concluded Projects

Objectives:



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Heating Performance of Room Conditioners

Combination	Area	Nominal (W)	Low (W)	Mid (W)	Max (W)	Power efficiency (%)	Fuel weight (kg)	Noise (dBA)	COP (W)	Annual (kWh)
12 + 24	800	800.00	1,000	1,000	800.00	80.00	800	1,000	800.00	800
600 + 600	900	900.00	1,000	1,000	900.00	900.00	700	1,000	900.00	900
1000 + 800	1000	900.00	1,000	1,000	900.00	900.00	700	1,000	900.00	900
900 + 1000	900	900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900
Total	3,600.00	3600.00	4,000.00	4,000.00	3600.00	3600.00	3,000.00	4,000.00	3600.00	3600.00
Average	900.00	900.00	1,000.00	1,000.00	900.00	900.00	750.00	1,000.00	900.00	900.00

Note: The percentage breakdown (12 + 24 & 600 + 600) were calculated on 1000 of southern region (Gwalior, Chambalpradesh, Amarkapur & Delhi) as COP. The newly developed Lossless work's chart as per with MCC + 00 and home appliance with PM + CDC.

COP Performance of Promising Combinations

Location	Combination	Nominal (W)	Low (W)	Mid (W)	Max (W)	Power efficiency (%)	Fuel weight (kg)	Noise (dBA)	COP (W)	Annual (kWh)
Gwalior, Rajasthan	12 + 24	800.00	1,000	1,000	800.00	80.00	800	1,000	800.00	800
		800.00	1,000	1,000	800.00	80.00	800	1,000	800.00	800
	600 + 600	900.00	1,000	1,000	900.00	900.00	700	1,000	900.00	900
		900.00	1,000	1,000	900.00	900.00	700	1,000	900.00	900
	1000 + 800	900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900
		900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900
	900 + 1000	900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900
		900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900
Chambalpradesh, Amarkapur & Delhi	12 + 24	800.00	1,000	1,000	800.00	80.00	800	1,000	800.00	800
		800.00	1,000	1,000	800.00	80.00	800	1,000	800.00	800
	600 + 600	900.00	1,000	1,000	900.00	900.00	700	1,000	900.00	900
		900.00	1,000	1,000	900.00	900.00	700	1,000	900.00	900
	1000 + 800	900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900
		900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900
	900 + 1000	900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900
		900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900
Others	12 + 24	800.00	1,000	1,000	800.00	80.00	800	1,000	800.00	800
		800.00	1,000	1,000	800.00	80.00	800	1,000	800.00	800
	600 + 600	900.00	1,000	1,000	900.00	900.00	700	1,000	900.00	900
		900.00	1,000	1,000	900.00	900.00	700	1,000	900.00	900
	1000 + 800	900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900
		900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900
	900 + 1000	900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900
		900.00	1,000	1,000	900.00	900.00	800	1,000	900.00	900

1. Regular combination symbol 2. Regional combination (source)

Varietal Recommendation:

The five new polyvoltine breeds viz., LL-19_HR2, HR4 and HR8 were developed through selection adopting high temperature and SHAPY pathogen as stress factors could be involved and effectively utilized in further breeding programmes to develop polyvoltine breed resistant to biotic and abiotic stress. The new breeds need to be changed for saturnia shakes at least once in a year to keep the vigor alive. Two new crossbreds CSR 2 × SK and HR4 × SK performed significantly superior over the existing popular crossbreds, PM × CSR2 with respect to cocoon/shell and cocoon/seed traits and can be further tested and recommended for commercial exploitation to increase the quality of bivoltine silk production in India.

Ongoing Project:

ABITEM: Improvement of Pure Mysore race for productivity and silk quality (Jan. 2017 – Dec. 2018)

Undertaken by: Dr. (Mrs.) Jayalakshmi and Dr. Rudresh, Pr. Scientists and Dr. Vijaya

Objective: To improve Pure Mysore race for improved hybrid vigour and fibre quality

The Pure Mysore race selected from the identified isolates (PM 3 & 5x2) were maintained for further selection based on race appearance and compared using with other elite characteristics of the bivoltine selection was followed for the isolation of improved PM lines based on cocoon characters grading. Eight improved PM lines with longer filament length were maintained for further characterization for silk fibre quality as per targeted objectives in the generations.

Traits	Mean value of PM lines		Pure PM
	Range	Mean	
Cocoon wt.	1.62	1.80	1.70
Shell wt.	0.31	0.33	0.32
Shell ratio	19.8	18.4	18.8
Filament length	1.80	1.90	1.85
Denier	2.80	2.90	2.85
Reelability	77.0	81.0	79.0
Raw silk	0.49	0.51	0.50
Cocoon yield/100 dfls	160	167	164
Shell yield/100 dfls	31.0	33.0	32.0

Characters	Cross 1		Cross 2	
	Range	Mean	Range	Mean
Cocoon wt. (g)	1.62 – 1.80	1.70 – 1.90	1.62 – 1.80	1.70 – 1.90
Shell wt. (g)	0.31 – 0.33	0.32 – 0.34	0.31 – 0.33	0.32 – 0.34
Shell ratio (%)	18.4 – 19.8	18.8 – 20.0	18.4 – 19.8	18.8 – 20.0
Filament length (m)	1.80 – 1.90	1.85 – 1.95	1.80 – 1.90	1.85 – 1.95
Denier	2.80 – 2.90	2.85 – 2.95	2.80 – 2.90	2.85 – 2.95
Reelability (%)	77.0 – 81.0	79.0 – 83.0	77.0 – 81.0	79.0 – 83.0

ABITEM: Development of improved cross breeds of Silkworm, *Bombyx mori* L. suitable for south India (Mar. 2015 – Mar. 2018)

Undertaken by: Dr. (Mrs.) Jayalakshmi, S.M. Ghosh Kumar, Dr. Basavaraj, Dr. Vijaya and Dr. Rudresh

Objective: To develop crossbreds with high cocoon productivity and improved silk quality

The project was initiated with 10 parental breeds (3 grainage yellow, 3 dark yellow & 3 white). From which 90 PL crosses were evaluated for overall performance, cocoon yield/100 dfls and fibre quality. Twenty two selected PL's were utilized further for some good multivoltine strains. Four generations (F1-F4) of these lines were reared and evaluated for the targeted objectives (details are mentioned in Table, cocoon shell and silk quality) and 08 lines were released for further evaluation.

Yielding performance of improved cut flower lines

Breeding Lines	Parentage	No. of Days	[illegible]	[illegible]	[illegible]	[illegible]
1	[illegible]	144	[illegible]	[illegible]	[illegible]	[illegible]
2	[illegible]	161	[illegible]	[illegible]	[illegible]	[illegible]
3	[illegible]	153	[illegible]	[illegible]	[illegible]	[illegible]
4	[illegible]	143	[illegible]	[illegible]	[illegible]	[illegible]
5	[illegible]	140	[illegible]	[illegible]	[illegible]	[illegible]
6	[illegible]	134	[illegible]	[illegible]	[illegible]	[illegible]
7	[illegible]	151	[illegible]	[illegible]	[illegible]	[illegible]
8	[illegible]	150	[illegible]	[illegible]	[illegible]	[illegible]
9	[illegible]	147	[illegible]	[illegible]	[illegible]	[illegible]
10	[illegible]	153	[illegible]	[illegible]	[illegible]	[illegible]
11	[illegible]	152	[illegible]	[illegible]	[illegible]	[illegible]
12	[illegible]	147	[illegible]	[illegible]	[illegible]	[illegible]
13	[illegible]	151	[illegible]	[illegible]	[illegible]	[illegible]
14	[illegible]	150	[illegible]	[illegible]	[illegible]	[illegible]
15	[illegible]	147	[illegible]	[illegible]	[illegible]	[illegible]

Commercial and other Activities

Post trial of improved cut spikes, Cookery demonstration etc.

S.E. Kulkarni, Seema, P.C. and V. Deshpande

Objective: Generation of SNP and SSR data useful for PI protection and fine mapping of new QTL

TC seed production for [illegible] as work germplasm [illegible] (Jung, 96, Wing) in 2 patches for the production of [illegible] Pauley Rust. The [illegible] were [illegible] to the Recovery (1 QTL) in [illegible], 47 and Rpm1 Rust under TC throughout the year and an average yield of 74 kg/ha was recorded. Dr. quality test [illegible] has recorded to be [illegible] as compared to [illegible] in the [illegible] hybrid, Pusa DMC.

Rust Pb Resistance of Recovery Gene (RPG-MD)			
Rpm	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

Maintenance of [illegible] disease [illegible]

Chandrashekhar, S.Q., Dayananda, J.B. Kulkarni, R.K. Deepthi, and Ashappa

Objective: Maintenance of [illegible] disease screening to [illegible] resistance

Multiplication [illegible] were maintained conforming to their original breed characteristics by free [illegible]

[illegible] LABORATORY

[illegible] Research Projects:

[illegible] Evaluation of FC1 x FC2 - A new bivoltine double hybrid for sub-tropical conditions
Jan. 2015 - Dec. 2016

[illegible]

[illegible]

Objective: To evaluate the field performance of newly evolved bivoltine double hybrid, FC1 x FC2 for productivity and silk quality.

[illegible]

[illegible]						
Hyb.	Dfls (Nos)	Yield/ 100dfls (kg)	Pupation Rate (%)	Cocoon wt. (g)	Shell wt. (g)	Shell ratio (%)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Total/Mean	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Total/Mean	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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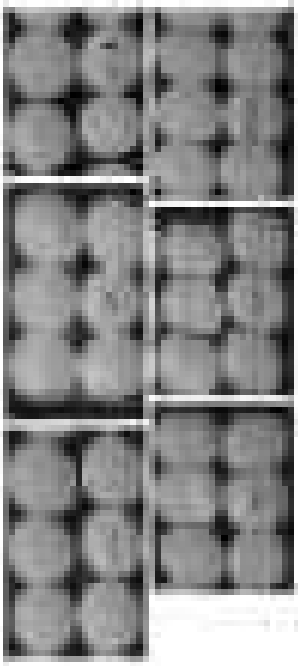

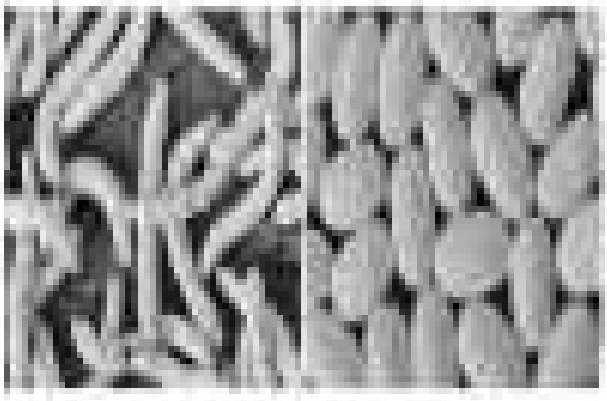

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I	[illegible]	[illegible]	[illegible]
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III	[illegible]	[illegible]	[illegible]
IV	[illegible]	[illegible]	[illegible]
V	[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]

Field Performance of Hybrids

The [illegible] of [illegible] hybrid, [illegible] were [illegible] to the farmers' [illegible] around the [illegible] through [illegible] [illegible] of [illegible], AP, TN and Maharashtra. The data on [illegible] performance of [illegible] was collected and documented. The farmer's opinion [illegible] was recorded and evaluated for [illegible] parameters with [illegible] [illegible] of [illegible].

Trait	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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अनुसूचित जातियों के लिए उपयोजना

Maintenance of Shuddha Sitaamru-Germplasm Stocks

...conservation seeding of six Shuddha germplasm stocks involving breeding line accessions as sub-samples from previous breeding programmes and four F2H breeds confirming to the original characteristics was undertaken for their conservation maintenance and further utilization.

Field testing of newly developed Shuddha crosses hybrid, ...

Preliminary field testing of ... was carried out at ... and ... showing good adaptability. No significant variations in the morphological parameters were observed in the DFT performance at ... Germplasm.

Name/Performance of ... Hybrid Testing					
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...

Performance of ... Germplasm Hybrid Stocks					
...	...	...	...	...	...
...	...	...	...	...	...
...	...	...	...	...	...

were kept blooming for self and cross (Shivamogga Maintenance) Procedures. The ripening performance of pods was documented and monitored in conformity with the original breed characteristics. The hybrid vigour of commercial hybrid combinations was evaluated each hybrid to determine the stability of breed and hybrids.

Performance of Modified Breeds					
Method	Important trait (%)	Yield potential (kg/ha)	Common use (g)	Seed size (g)	Yield (%)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

A total of [illegible] elite breed lines (P4, F3, & F2) were prepared from the selected pools of seven inspection crosses for supply to F3 and F2 multiplication centres of SAT & CES to join the requirement (2445 qtls). Potential monitoring of these plants was monitored systematically at pre-designed stages following stringent measures/ methods.

SUGARCANE PHYSIOLOGY LABORATORY

Ongoing Projects

AP 1005: Development of value added products from sweet sorghum, Bombay sorrel & [illegible] (Collaborative with SAMP-Bangalore, Apr. 2018 - Mar. 2019)

CSRI-Maligaon: [illegible]

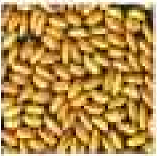
SAMP-Bangalore: [illegible]

Objectives:

- [illegible]
- [illegible]

Isolation and Characterization of [illegible] from Pigeon Pea

[illegible]



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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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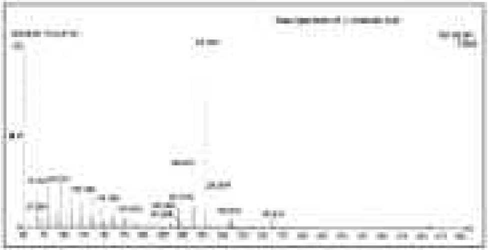
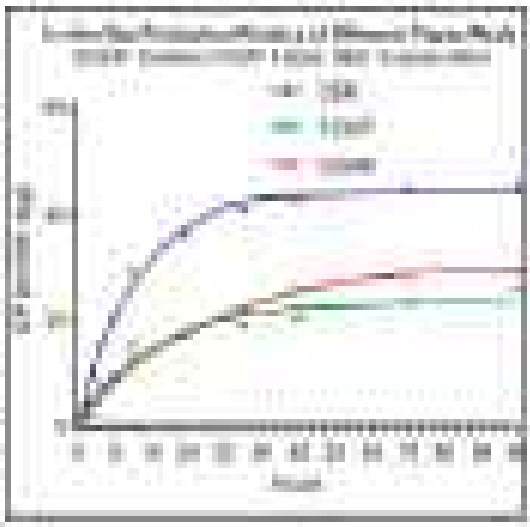
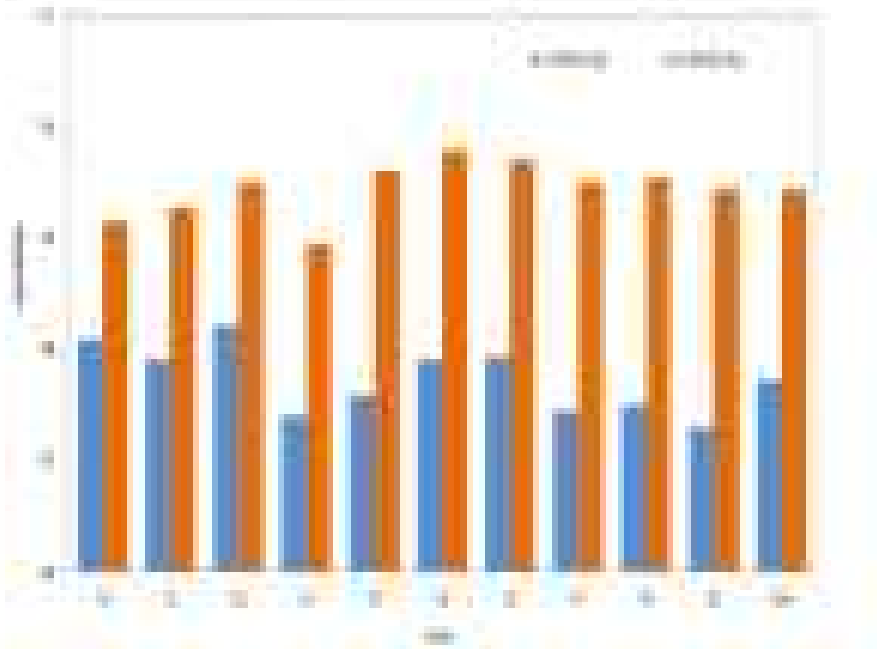


Development of UAV Web decoding Lotte Hub





AP 5554 Feed Supplementation studies for improving young age Silkworm rearing in Chawki Rearing Centres (2021-2024-upto 2025)

P. Basavaraja, P. Thiyagutheeb and M. Muralidharan Reddy

Objectives: To enhance feed response, growth and survival of young silkworms through feed supplementation and normalize chawki food growth for cocoon productivity

Various feed supplements were identified and are being evaluated for improving chawki larval feed response and growth through mulberry leaf and artificial diet. Maximum survival, feed response and larval growth rate observed with ascorbic acid. Most effective supplements would be further evaluated by artificial diet for better chawki rearing.

Continuous/Other Activities

Mother culture maintenance of Cordyceps and production of fruiting bodies

[illegible]

Objective: To maintain Cordyceps and other spp. cultures for original characters

Mother cultures of 11 isolates of eight Cordyceps spp. from different sources are being maintained and multiplied on potato dextrose agar (PDA) and Sabouraud dextrose agar yeast (SDAY) media periodically at [illegible]. All isolates were tested for viability in [illegible] [illegible] fruiting body formation of Cordyceps. [illegible]

[illegible]

Ongoing Research Projects

[illegible] Identification of robust silkworm double hybrids suitable for different regions of high temperature and high humidity conditions [illegible]

[illegible]

Objectives:

- To evaluate silkworm double hybrids under high temperature and high humidity
- To determine the factors influencing the post-cocoon parameters under high temperature and humidity

[illegible]

Performance of Cocoon Hybrids @ Poor Temperature & High Humidity

Hybrids	Pupal Weight (g)	Cocoon Weight (g)	Shell Weight (g)	Shell Ratio (%)	Cocoon Length (cm)	Cocoon Width (cm)	Filament Length (m)	Denier	Reeling Percentage (%)	Reeling Out-turn (%)	Overall Grade
CH1A	32.6	1.258	0.278	22.09	3.42	2.29	750.00	3.00	2.77	70.00	FC
CH2A	32.1	1.265	0.265	21.00	3.50	2.30	775.00	2.94	2.74	71.00	FC
CH3A	31.5	1.250	0.255	20.40	3.45	2.28	760.00	2.97	2.76	70.50	FC
CH4A	32.0	1.260	0.260	20.63	3.48	2.29	765.00	2.95	2.75	70.80	FC
CH5A	31.8	1.255	0.258	20.56	3.46	2.28	758.00	2.96	2.75	70.60	FC
CH6A	32.3	1.270	0.270	21.26	3.44	2.30	770.00	2.93	2.73	71.00	FC
CH7A	32.4	1.275	0.272	21.33	3.47	2.31	780.00	2.92	2.72	71.20	FC
CH8A	32.2	1.268	0.268	21.14	3.49	2.30	772.00	2.94	2.74	71.00	FC
CH9A	32.0	1.262	0.262	20.76	3.43	2.29	768.00	2.96	2.75	70.70	FC
CH10A	31.9	1.255	0.255	20.32	3.41	2.27	755.00	2.98	2.77	70.40	FC
CH1B	31.1	1.230	0.240	19.51	3.38	2.25	740.00	3.02	2.80	69.80	FC
CH2B	30.8	1.215	0.230	18.93	3.35	2.24	730.00	3.05	2.83	69.50	FC
CH3B	31.0	1.225	0.235	19.18	3.36	2.24	735.00	3.04	2.82	69.60	FC
CH4B	30.5	1.205	0.225	18.67	3.33	2.23	720.00	3.07	2.85	69.20	FC
CH5B	30.9	1.220	0.232	19.02	3.34	2.24	728.00	3.06	2.84	69.40	FC
CH6B	31.2	1.235	0.245	19.84	3.39	2.26	745.00	3.01	2.79	69.90	FC
CH7B	31.4	1.245	0.250	20.08	3.40	2.26	750.00	3.00	2.78	70.00	FC
CH8B	31.3	1.240	0.248	20.00	3.41	2.27	748.00	3.01	2.79	69.90	FC
CH9B	31.0	1.228	0.238	19.38	3.37	2.25	738.00	3.03	2.81	69.70	FC
CH10B	30.7	1.210	0.228	18.84	3.32	2.22	725.00	3.08	2.86	69.30	FC
CH1C	30.2	1.190	0.210	17.65	3.28	2.20	710.00	3.12	2.89	68.90	FC
CH2C	30.5	1.200	0.215	17.92	3.30	2.21	715.00	3.11	2.88	69.00	FC
CH3C	30.0	1.180	0.205	17.37	3.26	2.19	705.00	3.14	2.91	68.80	FC
CH4C	30.3	1.195	0.208	17.41	3.27	2.20	708.00	3.13	2.90	68.90	FC
CH5C	30.1	1.185	0.202	17.04	3.25	2.18	700.00	3.15	2.92	68.70	FC
CH6C	30.4	1.198	0.212	17.70	3.29	2.21	712.00	3.10	2.87	69.00	FC
CH7C	30.6	1.205	0.218	18.09	3.31	2.22	718.00	3.09	2.85	69.20	FC
CH8C	30.2	1.192	0.208	17.45	3.28	2.20	708.00	3.13	2.90	68.90	FC
CH9C	30.0	1.180	0.200	16.95	3.24	2.17	695.00	3.17	2.94	68.60	FC
CH10C	29.8	1.170	0.195	16.67	3.22	2.16	690.00	3.19	2.96	68.40	FC
CH1D	29.5	1.150	0.180	15.65	3.18	2.13	675.00	3.24	3.00	67.90	FC
CH2D	29.8	1.165	0.188	16.14	3.20	2.14	682.00	3.22	2.98	68.10	FC
CH3D	29.4	1.145	0.175	15.28	3.16	2.12	668.00	3.26	3.02	67.80	FC
CH4D	29.6	1.158	0.182	15.72	3.17	2.13	675.00	3.24	3.00	67.90	FC
CH5D	29.3	1.140	0.170	14.91	3.14	2.11	660.00	3.28	3.04	67.70	FC
CH6D	29.7	1.160	0.185	15.95	3.19	2.14	678.00	3.23	2.99	68.00	FC
CH7D	29.9	1.172	0.192	16.38	3.21	2.15	685.00	3.21	2.97	68.20	FC
CH8D	29.6	1.155	0.178	15.41	3.15	2.12	670.00	3.25	3.01	67.80	FC
CH9D	29.4	1.148	0.172	14.98	3.13	2.10	662.00	3.27	3.03	67.60	FC
CH10D	29.2	1.135	0.165	14.54	3.11	2.09	655.00	3.30	3.06	67.40	FC
CH1E	28.8	1.110	0.150	13.51	3.06	2.06	640.00	3.36	3.11	66.90	FC
CH2E	29.1	1.125	0.158	14.04	3.08	2.07	648.00	3.33	3.09	67.10	FC
CH3E	28.7	1.105	0.145	13.12	3.04	2.05	635.00	3.38	3.13	66.80	FC
CH4E	28.9	1.118	0.152	13.59	3.05	2.06	642.00	3.35	3.10	67.00	FC
CH5E	28.6	1.100	0.140	12.73	3.02	2.04	630.00	3.40	3.15	66.70	FC
CH6E	29.0	1.130	0.162	14.34	3.09	2.08	652.00	3.32	3.08	67.20	FC
CH7E	29.2	1.140	0.170	14.91	3.12	2.09	660.00	3.30	3.06	67.40	FC
CH8E	28.8	1.112	0.148	13.31	3.07	2.06	638.00	3.37	3.12	66.90	FC
CH9E	28.7	1.108	0.142	12.82	3.05	2.05	632.00	3.39	3.14	66.80	FC
CH10E	28.5	1.095	0.135	12.33	3.03	2.03	625.00	3.42	3.17	66.60	FC

Hybrid	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Denier	[illegible]	[illegible]	[illegible]
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Hybrid	[illegible]	[illegible]	[illegible]	[illegible]	Hybrid	[illegible]	[illegible]	[illegible]	[illegible]
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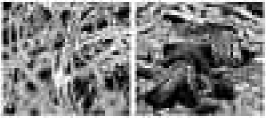
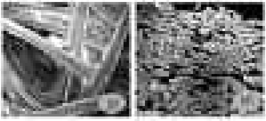
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

The cocoons of bivoltine hybrids reared at high temp. & high humidity and optimal conditions were subjected to scanning electron microscopic (SEM) studies on cocoon surface and cocoon cross section to record the filament density and sericin content.



Scanning electron microscopic images of (a) cocoon surface of bivoltine reared at high temp & high humidity (SEM) with [illegible] sericin content & (b) cocoon cross section (SEM) showing loosely packed [illegible] filaments.



Scanning electron microscopic images of (c) cocoon surface of bivoltine reared at optimal temp. & humidity (SEM) with normal sericin content & (d) cocoon cross section (SEM) showing closely packed filaments.

Other Activities

Large Scale Multiplication of Planned Breeds

Hatching of chicks once in three months as per the schedule, for the egg production and large scale multiplication of Nandanam-I and Chandragiri, a quantity of 1,250 DAY OLD CHICKS were generated for nucleus stock preparation

Breed	Month	No.	Sex ratio (M:F)	Body weight (g)	Hatchability (%)	Remarks
Nandanam-I	April	600	1:5	1,250	92.5	Good
	May	650	1:5	1,260	93.0	Good
Chandragiri	April	550	1:5	1,240	91.8	Good
	May	600	1:5	1,255	92.4	Good
Total		2,400				

EXTENSION SECTION

Continuous/Other Activities

E-Linkages

Telephonic Incentive (TIME) and Motivational (MET) sessions from Scientists/ Veterinary Officers were conducted to conduct technical sessions and production training for the newly appointed Para-VAHWs. A total of 1542 Incentive and motivational trainings were conducted on chicks/ layer/ eggs/ and the reproductive performance of pure lines and synthetic.

Breed / Line	Age at First Egg (Days)	Body Weight at First Egg (g)	Egg Weight at 28 Weeks (g)
Nandanam-I	168	1,420	52.5
Chandragiri	175	1,380	50.8
Nandanam-II	172	1,400	51.6
Control	180	1,350	49.2
Synthetic-A	170	1,410	52.0
Synthetic-B	174	1,390	51.1

TECHNOLOGY VALIDATION & DEMONSTRATION CENTRE

Continuous/Other Activities

Large Scale Production and Multiplication of Nandanam Breeds/Hybrids

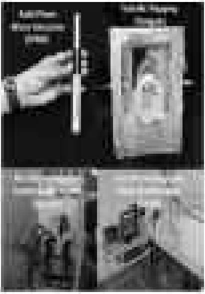
TC, Centre and C.Chickpeas

Objective: To evaluate different breeding lines and multiply the elite line for seed production

Technology Validation and Demonstration Centre produces large scale in house evaluation of promising crossbreeds/synthetic and validate for further field testing and adoption. This exercise carries out during production in conditions resembling farmers conditions, ensures large scale multiplication of parental stocks for commercial hybrid production, facilitating field testing of hybrids, which (multiplication) and 10 (evaluation) are two new crossbreed breeds identified for the production of marketable crossbreed. Carcass yield, FCR, Laying rate, Egg production, Egg weight, Egg quality, Egg shell thickness, Egg shell strength, Egg shell colour, Egg shell texture, Egg shell porosity, Egg shell permeability, Egg shell conductance, Egg shell resistance, Egg shell capacitance, Egg shell inductance, Egg shell impedance, Egg shell admittance, Egg shell susceptance, Egg shell reactance, Egg shell resonance, Egg shell damping, Egg shell attenuation, Egg shell absorption, Egg shell reflection, Egg shell transmission, Egg shell scattering, Egg shell diffraction, Egg shell interference, Egg shell polarization, Egg shell birefringence, Egg shell dichroism, Egg shell fluorescence, Egg shell phosphorescence, Egg shell luminescence, Egg shell chemiluminescence, Egg shell bioluminescence, Egg shell electroluminescence, Egg shell photoluminescence, Egg shell thermoluminescence, Egg shell triboluminescence, Egg shell sonoluminescence, Egg shell crystalloluminescence, Egg shell fractoluminescence, Egg shell piezoluminescence, Egg shell radioluminescence, Egg shell cathodoluminescence, Egg shell anodoluminescence, Egg shell electroluminescence, Egg shell photoluminescence, Egg shell thermoluminescence, Egg shell triboluminescence, Egg shell sonoluminescence, Egg shell crystalloluminescence, Egg shell fractoluminescence, Egg shell piezoluminescence, Egg shell radioluminescence, Egg shell cathodoluminescence, Egg shell anodoluminescence.

The crops of [illegible] were raised and generated [illegible] kg (2.50 lakh) seed material. These seed were utilized for common farmers' production [illegible] and to evaluate existing performance

PEST MANAGEMENT LABORATORY



were characterized, among them monoterpenes, diterpenes, phenolic compounds and sesquiterpenes.

Solid Phase Micro Extraction (SPME) technique was developed for the detection of all fly attractants, which was rapid in analysis, solventless and extracts more number of volatile fungal chemicals with single fibre. Use of a confusing mix on food and the larval host directly attracts flies but no one paid much attention using safety software. The medical fly antenna was found to be more sensitive and intelligent detectors and responds to female sex pheromones. The antennae and EC (claw) were recorded and the excitatory peaks were identified. The volatiles from the all fly assaulting microbes were identified using gas chromatography coupled mass spectrometer (GC-MS). Mass fragmentation patterns were used for the identification of volatiles, which helped the presence of chemicals viz. Acetophenone, benzoyle, Benzyl, Phenyl propanoic acid, Hexadecane and Octadecadienoic. Aromatic alkane nature was identified through the antennal detector.

Retention time (RT) in min	Name	Chemical nature (Type of)
4.5	[illegible]	[illegible]
5.1	[illegible]	[illegible]
5.5	[illegible]	[illegible]
6.2	[illegible]	[illegible]
7.1	[illegible]	[illegible]
8.3	[illegible]	[illegible]
9.1	[illegible]	[illegible]
10.2	[illegible]	[illegible]
11.1	[illegible]	[illegible]
12.3	[illegible]	[illegible]
13.1	[illegible]	[illegible]
14.2	[illegible]	[illegible]
15.3	[illegible]	[illegible]
16.1	[illegible]	[illegible]
17.2	[illegible]	[illegible]
18.3	[illegible]	[illegible]
19.1	[illegible]	[illegible]
20.2	[illegible]	[illegible]
21.3	[illegible]	[illegible]
22.1	[illegible]	[illegible]
23.2	[illegible]	[illegible]
24.3	[illegible]	[illegible]
25.1	[illegible]	[illegible]
26.2	[illegible]	[illegible]
27.3	[illegible]	[illegible]
28.1	[illegible]	[illegible]
29.2	[illegible]	[illegible]
30.3	[illegible]	[illegible]
31.1	[illegible]	[illegible]
32.2	[illegible]	[illegible]
33.3	[illegible]	[illegible]
34.1	[illegible]	[illegible]
35.2	[illegible]	[illegible]
36.3	[illegible]	[illegible]
37.1	[illegible]	[illegible]
38.2	[illegible]	[illegible]
39.3	[illegible]	[illegible]
40.1	[illegible]	[illegible]
41.2	[illegible]	[illegible]
42.3	[illegible]	[illegible]
43.1	[illegible]	[illegible]
44.2	[illegible]	[illegible]
45.3	[illegible]	[illegible]
46.1	[illegible]	[illegible]
47.2	[illegible]	[illegible]
48.3	[illegible]	[illegible]
49.1	[illegible]	[illegible]
50.2	[illegible]	[illegible]

Antennal EAG Response to [illegible] in male and female flies

Treatment	Conc.	Male Response (mean mV ± SE)
[illegible]	1 mg	1
[illegible]	0.1 mg	1
[illegible]	0.01 mg	1
[illegible]	0.001 mg	1
[illegible]	0.0001 mg	1

Antennal EAG Response to [illegible] in male and female flies

Conc. (mg)	Male Response	Female Response (mean mV ± SE)
1	1	1
0.1	0	0
0.01	1	1
0.001	0	0
0.0001	0	0
0.00001	1	1

Antennal EAG Response to [illegible] and [illegible] in male and female flies

Ratio	Male Response (mean)	Female Response (mean mV ± SE)
0.1 mg + 0.01 mg + 0.1 mg	0	1
0.1 mg + 0.01 mg + 0.1 mg	0	1
0.01 mg + 0.1 mg + 0.01 mg	0	1
[illegible] (Control @ 0 mg)	0	1

Bioassay identification

Solvent extracts of different plant parts were tested for their bioactivity against *Helicoverpa armigera* (Hübner) and *Spodoptera litura* (Fabricius) in the laboratory. Results revealed that the hexane extract of leaves of *Jatropha curcas* L. was highly effective against *H. armigera* with 100% mortality at 48 hours after treatment. The LC50 value was 0.42% and the LC90 value was 0.89%. The extract also showed significant antifeedant activity, reducing leaf consumption by 78% at 0.5% concentration. Gas chromatography-mass spectrometry (GC-MS) analysis revealed the presence of 12 major compounds, including phorbol esters, curcin, and jatrophone. These compounds are known for their insecticidal properties. The findings suggest that *J. curcas* leaf extract can be developed as a botanical insecticide for the management of *H. armigera* in cotton and pigeonpea.

Chemical profile of hexane extract of *Jatropha curcas* leaves			
Peak no.	Retention time (min)	Compound name	Area (%)
1	12.45	2-Hexenal, (E)-	3.21
2	15.78	1-Hexanol	1.84
3	18.92	Phorbol-12-myristate-13-acetate	22.47
4	21.36	Curcin	15.63
5	24.10	Jatrophone	9.75
6	27.58	Linoleic acid	6.12
7	30.44	Oleic acid	4.38

Identification of volatiles from Mulberry Leaf

GC-EAG and GC-MS studies confirmed the presence of 15 electrophysiologically active compounds in the mulberry leaf volatile. Further, electrophysiological studies were conducted for determining the behavior of adult moth in response to the identified pheromone components. The mulberry leaf volatiles and synthetic pheromone components did not attract adult moths in the olfactometer bioassay. However, in combination with the pheromone components, they significantly enhanced the attraction of male moths. The results suggest that mulberry leaf volatiles may act as synergists for the pheromone components in the attraction of male moths.

Electrophysiological activity of volatiles from mulberry leaf		
Compound	Mean EAG response (mV)	Behavioral response (%)
Control (hexane)	0.12 ± 0.03	5.2 ± 1.8
Pheromone blend (Z9-16:Ald + Z11-16:Ald)	1.45 ± 0.21	62.4 ± 4.1
Mulberry leaf volatile blend	0.98 ± 0.15	38.6 ± 3.5
Pheromone + mulberry leaf volatiles	1.87 ± 0.26	81.3 ± 5.2
(Z)-3-Hexenol	0.76 ± 0.11	24.7 ± 2.9
(E)-2-Hexenal	0.64 ± 0.09	18.3 ± 2.4
Linalool	0.41 ± 0.07	9.8 ± 1.6
Benzaldehyde	0.33 ± 0.06	7.1 ± 1.3

Conclusion

- The pheromone components were isolated from the abdominal extract of virgin female adults and the pheromone blend was prepared as per the ratio of pheromone components. The lures were found effective in attracting male moths.
- Sex pheromone traps were effective in trapping male moths in the experimental plots.
- Neem oil was found effective in trapping the adult moths in the laboratory conditions.
- Four botanicals namely Neem oil, Karanj oil, Nirgundi oil and Tobacco decoction were found effective in trapping the adult moths in the laboratory conditions.

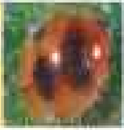
PME 2017: Survey & Surveillance of major pests and their natural enemies in multiple cropping system (Jan. 2016 - Dec. 2016)

J.S. Hanchinal, Sunanda [P], N. Hiremani*, K. Jameer*, S.S. Patil*, J. Gadhiya*, Mahesh Kumar* and Sandip Ahir [P.G. student] and Rahman Sab*

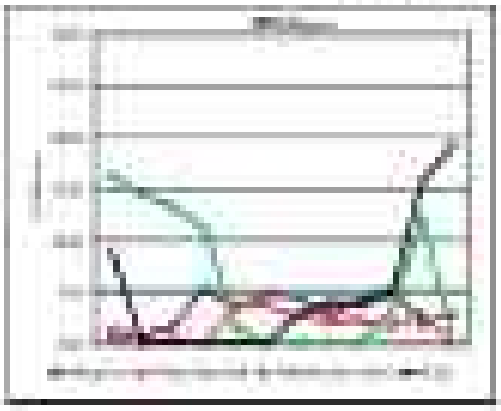
*Agricultural Entomology, Agricultural Microbiology, Agricultural Biochemistry, Agricultural Statistics, Agricultural Extension, Navsari Agricultural University, Navsari

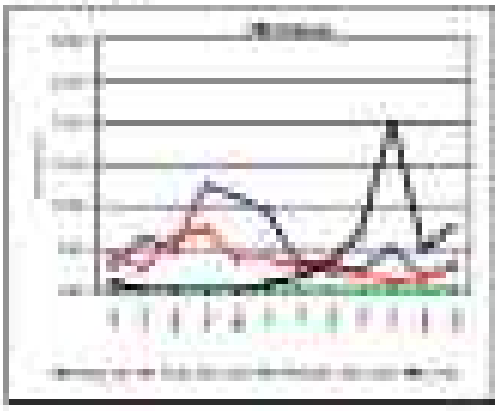
Objectives:

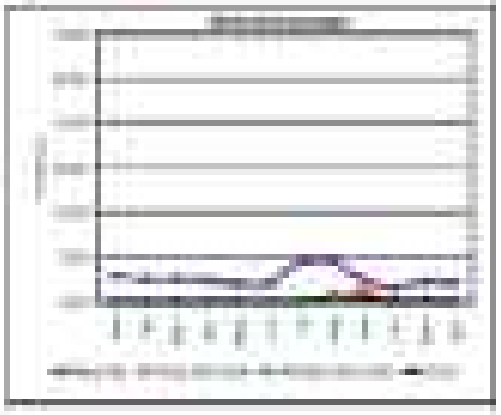
- To monitor the incidence of insect pests and their natural enemies in multiple cropping system
- To conduct the survey and study the seasonal incidence of insect pests, their parasitoids and predators
- To evaluate the cultural practices and their potential role in management of insect pests

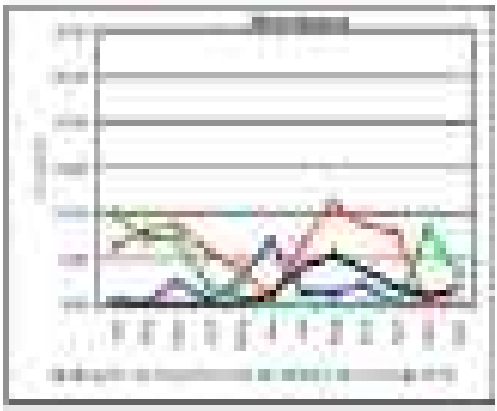


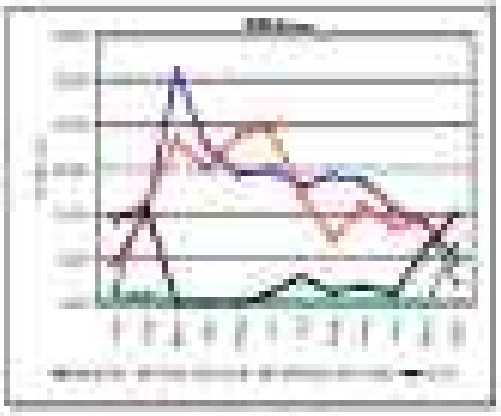
Instances of Major Accidents / Risks

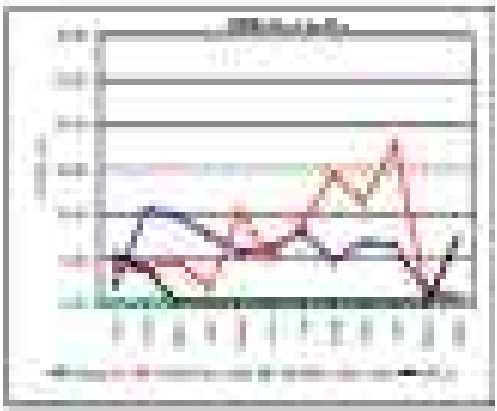


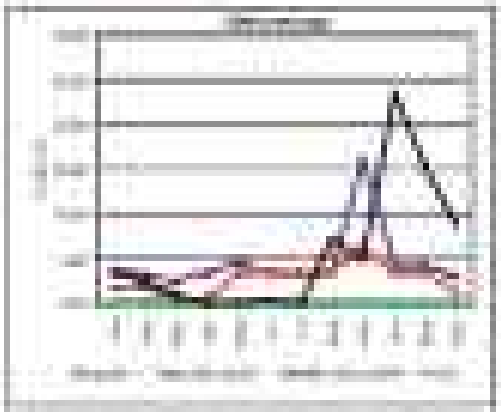












[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

Ongoing Projects

PIR 2040: Identification, characterization, synthesis and field evaluation of sex pheromones of the mulberry leaf roller, *Diaphania pulverulentalis* Swinhoe. Prioritized (In collaboration with Nikkh-sangrur) (Dec. 2008 - Dec. 2011)

I. S. Harrison Kumar (PI), Vinod Kumar Gupta (Co-PI), H. Ramesh*, N. Jayaramaiah** (PI) and Jayaramaiah** (Co-PI)
*RSC, Hoskote, **Kolar, Bangalore

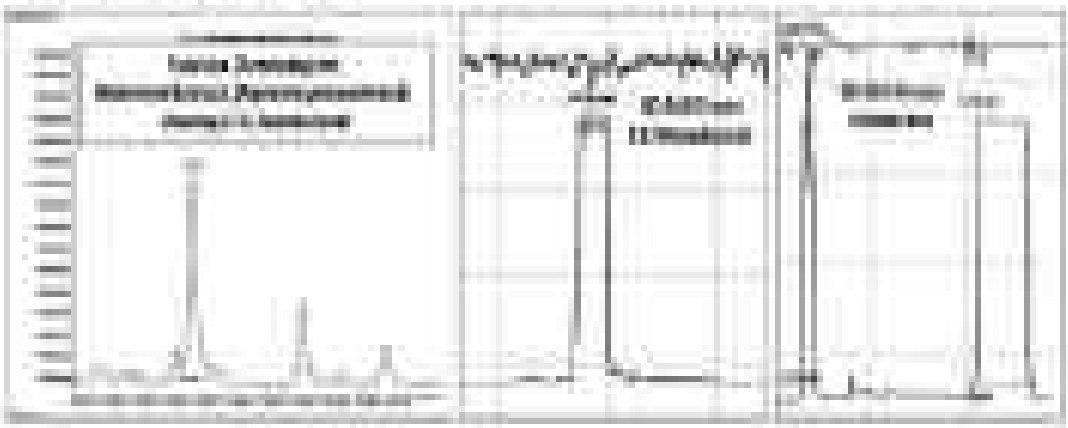
Objectives:

- To isolate and identify the sex pheromones of the leaf roller, *Diaphania pulverulentalis*
- To determine the bioefficacy of sex pheromone against leaf roller
- To develop suitable pheromone based trap for the leaf roller

Pheromone Analysis

Virgin female moths were made to contact the dorsal abdominal cuticle/setae and tested on the mulberry leaves. In the laboratory and pupae were used for further studies. The adults upon emergence were collected, sexed and maintained in cages. The virgin females between pre-oviposition and peak oviposition were used. The glands were dissected using a stereo zoomer (Nikon SMZ 745) and the extracts were filtered through Whatman filter paper and concentrated. The extract was used for the electrophysiological studies and analytical studies.

Gas Chromatography-Mass Spectrometry (GC-MS) technique was followed for the sex pheromone analysis. The GC-MS was kept in an active mode with the electron flash to trap the volatiles in glass chamber with virgin females of *Diaphania pulverulentalis* for around 2hr, after which the moths were directly injected into the GC-MS and the peaks were analyzed using Wiley software.



The male moths attracted was fixed in electroantennogram assembly and exposed to the female extracted extract. Antennae and EAG traces were recorded and the responding peaks were identified. The volatiles from the pheromone extract were identified using the gas chromatography coupled mass spectral detector (GC-MS). Mass spectrum index and mass spectra were used for the identification of volatiles. The volatiles from females were collected using entrainment method and the volatiles were identified using library library. The major component was identified as (3,4-epoxybutane) in GC-MS and other compounds as Octadecane.

Thereafter biochemical studies indicated that PBO-metabolic/esterase/glutathione enzyme system is higher in resistant, in addition to octadecane, there are other minor components which probably may be involved in behavioural and pheromonal functionalities. Further identification and characterization of major and minor pheromone components using FTIR & NMR spectroscopy and their field bioassay studies will be carried out.

[illegible] Activities

Maintenance of mother cultures for production of recommended biocontrol agents and host insects

[illegible] (up to September 2015), [illegible] (from July 2015), [illegible]

[illegible]

Objective: To maintain nucleus culture of bio control agents for mass production, research and supply to stakeholders

Nucleus cultures of the [illegible] parasitoids of uzi fly [illegible], [illegible], [illegible] and host [illegible] are maintained throughout the year. Besides, [illegible] the [illegible] units are also involved in the production of biocontrol agents and distributing to the stakeholders in the respective [illegible] areas. The release of biocontrol agents in the field facilitates effective management of [illegible] and uzi fly [illegible].

[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

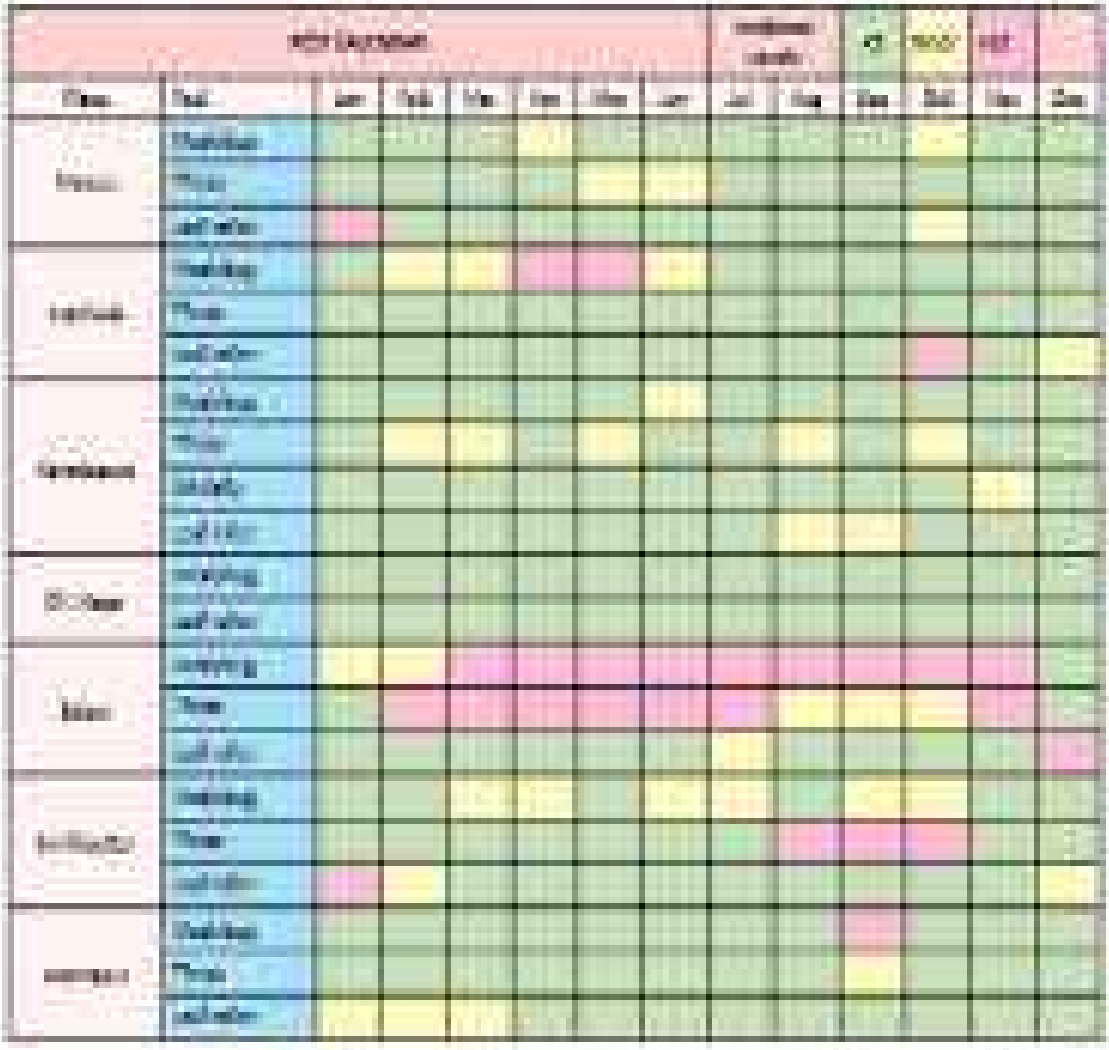
[illegible]

Forewarning and forecasting of mulberry pests

[illegible]

Objective: To document the status of mulberry pest incidence in southern India

[illegible]					
State	Season	[illegible]	[illegible]	[illegible]	[illegible]
Karnataka	Summer	[illegible]	[illegible]	[illegible]	[illegible]
	Rainy	[illegible]	[illegible]		[illegible]
	Winter	[illegible]	[illegible]	[illegible]	[illegible]
Tamil Nadu	Summer	[illegible]	[illegible]	[illegible]	[illegible]
	Rainy	[illegible]	[illegible]	[illegible]	[illegible]
	Winter	[illegible]	[illegible]	[illegible]	[illegible]
Andhra Pradesh	Summer	[illegible]	[illegible]		[illegible]
	Rainy	[illegible]	[illegible]		[illegible]
	Winter	[illegible]	[illegible]		[illegible]



SUBMISSION ANTHOLOGY SECTION

Continuous Assurance Projects

JAP 1000 Validation Hub of Automated Distribution of Hearing Forces (Jan. 2018 - Mar. 2019)

A. A. Hargreaves (Lead), G. Hatchcliffe, K. C. Lawrence, L. Hargreaves, Jonathan Lee, K. A. Wolf (Hub)

Objective: To evaluate the effectiveness of Automated Distribution of Hearing Forces in Hospitals

The concept of Automated distribution model for distribution of Unicorn Hearing Forces was presented at Transylvania Symposium Forensic Pathology (Oct. 12th 2016) on 1,000 Patients by a progressive Forensic Dr. S. A. Hargreaves, Magnificent Magic Lecturer, Scientist, Genetics. The Secretary Innovation was the Guest by the scientists at JAP Hospitals. The Framework model is validated at different medical units of JAP Hospitals (TVSC, JAP Hospitals, Wellington, FBI Hospitals and JAP Headquarters).

Hospitals	Manual		Automated	
	No.	Cost (%)	No.	Cost (%)
Headquarters	4	1,000	40	40
Tower	4 Nurses	40	4 nurses	40
Total	8 Nurses and 4	1,080	1 unit 40 nurses	1,080

Unicorn Hearings were processed in the hospitals units after conducting distribution through automated distribution system and regular distribution through power adapter was manipulated as control. 1000 participants

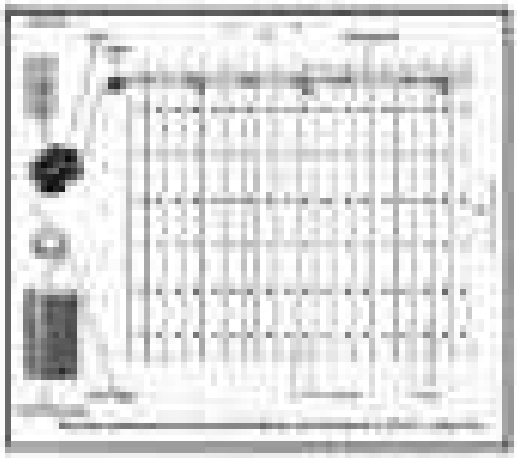
of on the stomach in the pots was on par with the scores. The survey model for automatic distribution of biocontrol resting shelf which reduces the drudgery and avoids exposure of the farmers to disinfectants. The models of different capacities were approved by CIPHET[illegible] and the units were priced at Rs.2500/- (2500.00 Rs) and Rs.3400/- (3400.00 Rs). These models are also marketed at [illegible] and complaints received in a timebound [illegible] manner. The automatic distribution model is being promoted by [illegible] under the Mechanization [illegible] of Agriculture Department and all units of automatic distributor models were [illegible] with the manufacturers.

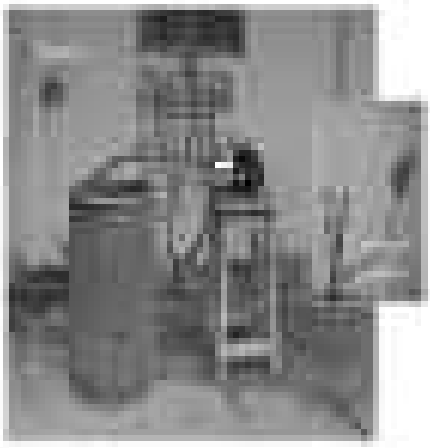
[illegible]	Resting House Size	
	30" x 30"	30" x 30"
[illegible]	800	800
[illegible]	4000	5000
[illegible]	3400	4500
[illegible]	1800	1800
[illegible]	[illegible]	[illegible]
[illegible]	4000	5000
[illegible]	1800	1800
[illegible]	1800	1800
[illegible]	30,200	34,500

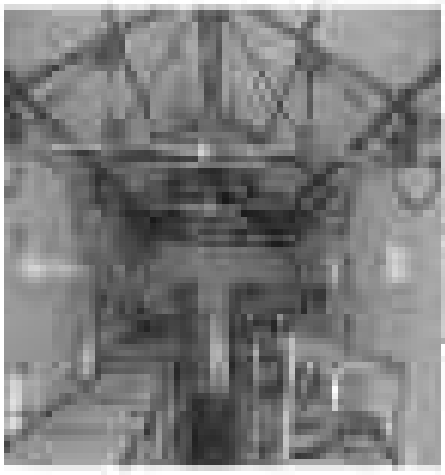
[illegible]

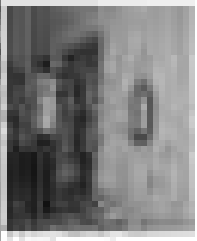
Automated distribution model is recommended to the farmers and the technical units of CIBCDoE to reduce drudgery and avoid exposure to disinfectants. After successful [illegible], the model was released in the farmers' [illegible] on [illegible] on 17.12.2017 and is [illegible] by CIPHET [illegible].

Automated Distribution Model for Biocontrol Resting Houses









Spray Box

Ongoing Projects

[illegible]

[illegible]

Objectives:

- [illegible]
- [illegible]

Silkworm disease monitoring is being conducted in every crop of [illegible]

[illegible]					
State	BSFs	Disease incidence (%)			
		Grasserie	Flacherie	Muscardine	Pebrine
Karnataka	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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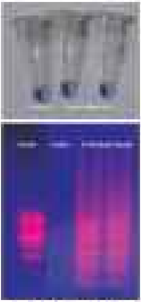
APF 0091: Standardisation and Validation of LAMP (Loop-mediated isothermal amplification assay/test) technique for the detection of Nosema bombycis infection in silkworm (Oct. 2015 - Sep. 2017)

Objectives:

- Standardization and Validation of LAMP based technique for specificity and sensitivity in detection of Nosema bombycis infection in silkworm and silkworm eggs.
- Fine tuning LAMP based techniques for specificity and sensitivity in early detection of N. bombycis.



A simple, efficient, cost-effective and less time consuming diagnostic system based on direct PCR and LAMP primers was developed as Modified LAMP method for pebrine detection in silkworm. The pebrine infection in N. bombycis inoculated silkworm was detected by modified LAMP method and dye (Hydroxy Naphthol Blue) was used as indicator dye. The PCR colour reactions of Modified LAMP were also confirmed by agarose gel electrophoresis of PCR products. The pebrine in the samples was confirmed by microscopic examination. Various indicator dyes (Neutral red, Methyl orange, Phenol Red, Malachite Green) were tested for developing contrasting colour observations instead of reaction mixture turning into light blue from dark purple blue in case of HNB. The utilization of these dyes were evaluated for easy sensitivity and specificity in the Modified LAMP method.

The basic seed production samples were utilized for validating Modified LAMP method. The results of regular microscopic test were similar to the observations by Modified LAMP method in egg shell, larval, pupal and moth samples. The egg production samples validated the microscopic examination of mother moth samples during egg production.

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POST COCOON EVALUATION UNIT

Continuous Activities

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INSTITUTIONAL RESEARCH PROJECTS

Commenced Projects

Project code: Design and development of silkworm rearing house models for hot and dry and hot and humid areas of peninsular India (Jan. 2014– Dec. 2016)

Project Scientists: Dr. Jayaprakash Rao, K.V. Sampathkumar, Dr. Chandrakala

Objectives: To design and develop silkworm rearing house models for non-traditional areas of sericulture which may be hot & dry and hot & humid climates

Management of controllable environmental conditions in the silk worm rearing house

A comprehensive study on the influence of microclimatic conditions prevailing in the silkworm rearing house on the performance of silkworm in non-traditional areas of sericulture in Karnataka, Andhra Pradesh and Telangana was undertaken based on meteorological data for the past 30 years (Indian Meteorological Department, MoEF, Govt. of India). The climatic conditions of non-traditional sericultural areas are very much different from the traditional areas of sericulture, which have relatively higher temperature and low humidity conditions for most of the year. Rearing of silkworms in such areas is a challenging task as the silkworm is very much sensitive to the microclimatic conditions prevailing in the rearing house. Hence, the present study was undertaken to find out the most important criteria for providing comfortable rearing environment for silkworms, instead of simply looking at the absolute figures of temperature and RH.

Climatic zones	Rainy months			Summer months		
	Mean temp. (°C)	Mean RH (%)	Enthalpy of air (kcal/kg of dry air)	Mean temp. (°C)	Mean RH (%)	Enthalpy of air (kcal/kg of dry air)
Hilly & Dry regions of North Karnataka (Zone III & IV)	22.40	68.60	11	1.64	54.00	11
Hilly & Humid regions of Coastal AP	22.40	80.60	11	1.10	80.00	11

Comparisons of temperature & relative humidity and enthalpy (environmentally convenient combination of rearing of mature silkworm)

For the management of optimum environmental conditions inside a silkworm rearing house, enthalpy, the latent heat of the mixture of constituting of temperature and relative humidity of ambient air has been determined using Psychrometrics. The optimum environmental conditions for silkworm rearing is 24–26°C temperature and 70–75% the overall enthalpy of moist air at these conditions works out to 11.8 kcal/kg of air. Based on enthalpy calculations, the combinations of temperature and relative humidity to be provided for a comfortable environment inside a silkworm rearing house have been determined. Enthalpy, the environmental conditions provided for silkworm rearing by maintaining optimum temperature (24–26°C) and relative humidity conditions is not complete. Enthalpy between temperature and relative humidity is a must for creating a comfortable environment for silkworms by maintaining enthalpy at around 11.8 kcal/kg of air. For example, if the temperature is 30°C, the RH should be decreased by 10% (enthalpy to read decrease) if temperature is 20°C, the RH should be increased by 5%.

Temperature (°C)	Relative humidity (%) at which enthalpy is 11.8 kcal/kg of air	Enthalpy of air (kcal/kg of air)
20	100	11.76
21	100	11.81
22	95	11.81
23	90	11.81
24	85	11.81
25	75	11.81
26	70	11.81
27	65	11.81
28	60	11.81
29	55	11.81
30	50	11.81
31	45	11.81
32	40	11.81
33	35	11.81
34	30	11.81
35	25	11.81

Low age silkworm rearing house

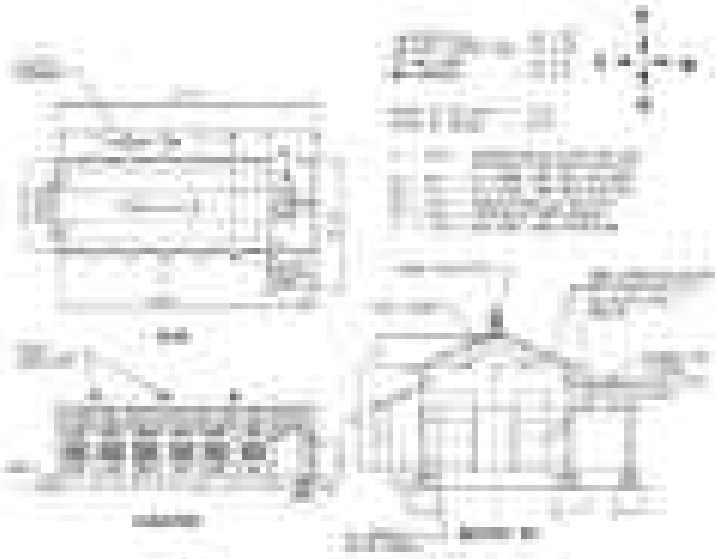
The low age silkworm rearing house in the project area were studied

site region to design, construction material etc. cost of the rearing house have been considered to bring the model designs given by CIFRI keeping in view weather affecting materials like bamboo or semi wood, joint & nails, grass, thatches etc. for making walls, windows or ventilators, colour coated sheets or GI, for roofs, doors, windows and ventilators made out of wood. Most of the farmers built rearing stands with 3 or more tiers to maximize the rearing capacity. Farmers also took care to construct rearing houses of bricks or with cemented pucca floors. Some farmers erected polythene sheet on roof top to reduce solar radiation during summer months.

Most of the farmers practicing silkworm in hot and dry regions realized that most of the time, the temperature is very much higher than 30°C and relative humidity never in the recommended value of 80 - 85% inside the rearing houses, but the cocoon productivity in these rearing houses was not affected and cocoons produced were of good quality. They expressed the need for better management of environmental conditions inside the silkworm rearing houses for further improvements in the cocoon productivity and quality.

Development of Model Silkworm Rearing House

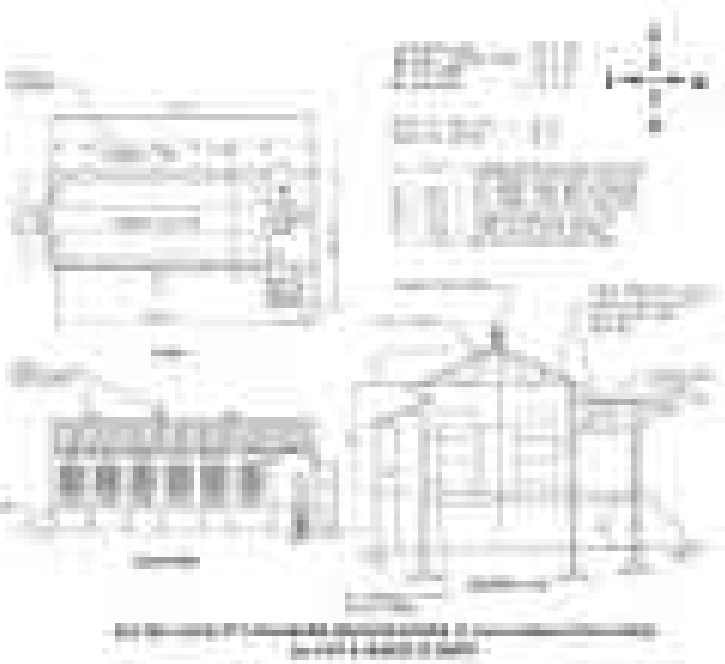
The model silkworm rearing houses for providing a healthy environment to late age silkworms for different climatic conditions have been designed based on the hypothesis that (i) the overlying tiles ceiling is ideal for comfortable climatic conditions rather than the absolute scale of temperature and relative humidity. The designs of silkworm of model rearing houses for different climatic conditions have been developed.



Guidelines for Construction of Silkworm Rearing Houses

The following guidelines should be followed while planning and constructing a silkworm rearing house for rearing better quality cocoons with higher productivity.

- The site for rearing house should be selected according to environmental conditions in which crops, within 3 kilometers, if any, sunny, well-ventilated and well-drained highland should be selected. The location of rearing house in an elevated place with ensure cross ventilation, good drainage system and convenient transportation system. Water should not stagnate around the rearing house premises.
- The rearing house site should have all season approach road for transportation of mulberry, young rearing bedding, workers, cocoons etc. by farm and transport vehicles.
- The orientation of rearing house has direct impact on rearing, lighting and rearing costs. By maintaining



southern exposure to maximize the use of sunlight and also to avoid direct sunlight falling on the birds. Proper orientation of the layer house will result in lower cooling costs, where it is most difficult to provide shade from sun.

- The minimum size of each unit of laying hen should be 4m (L) feet to accommodate two rows of cages back-to-back with a width of 1.5m.
- The poultry should be reared with adequate space and area. For 5000 chickens (100 birds) the land area should be at least 100 feet (wide) in the one and shade and a minimum of 100 feet (wide) is not good sunlight.
- The best location for ventilation is the ground and east direction of laying hen.
- A 1.5m-2m deep channel around inside the laying hall is essential to prevent entry of rats into the laying area and also to drain out water at the time of washing the floor. During summer, the water in the channel increases the humidity and cools the air entering through the open windows.
- The roof of laying house should be either of asbestos or galvanized. The idea of adding a side entry of soft into the laying house and also allow for the operation of cross-ventilators, which are very efficient in evacuating heat and moisture from the building.
- A foot-bath should be provided at the entrance of laying hall for hand and feet washing to the workers to avoid secondary contamination to the chickens.
- All the doors and windows should be fitted with corrosion resistant and fly-proof mesh to prevent entry of birds into the laying house.
- Water facility should be provided in the laying house for watering/sanitary disinfection and also for humidification purpose.
- The laying house should have electrical power supply, adequate lighting arrangements are essential for working during night. Electrical points should also be provided for using equipments such as heaters, humidifiers, coolers, power sprayer, defrosters etc.
- Installation of mesh and other plastic nets to cool the environment resulting in a simple and effective

media to reduce the heat transmission to building. Deciduous trees shall be planted on north and east side of existing house so these will provide shade by cutting very strong sun light during afternoons in summer months, in winter months, these will shed the leaves, hence allow maximum light on building to keep it warmer.

Other Activities

MMC Role Clarification: Developing a Memorandum for Understanding

5. Environment and Safety Issues

Objectives: To demonstrate and popularize modern innovations for safe operation with farmers and ensuring environmental safety.

The Disaster Prevention was demonstrated and on-farm training was organized to train 100 farmers, officials and workers related to tractor operation at CIAE Mini Farm Complex. A lot of enthusiasm was observed among farmers about the safety measures to be taken and some farmers came forward to procure the machines. Several farmers showed keen ability to set right values, including oil, water, and carrying out proper harvesting with minimum loss and time.

Two farmers (J. Sahu from AV & Tammata and a most innovative farmer identified as entrepreneurs and provided with the proper information, these farmers were trained on operation and maintenance of machines and they registered to the farmers in the respective villages. The feedback on the safety of the machine is also the machine was very useful for saving time, labour, expenditure (diesel, by 20%) and minimum reduction in drudgery.

AGRICULTURAL EXTENSION, ECONOMICS & MANAGEMENT DIVISION

S. B. Nagendra, R. Elangovan, A. Abdul Haris, C. S. Swamy, H.M. Mundinamani and R. Vijay Ram

Completed Research Projects

NAIP 10(5): Tools on Drought Management Practices in Mulberry Sericulture (Jan. 2010 – Dec. 2013)

A. Abdul Haris (PI), S. Nagendra, Hosur Narayanan, M.S. Jadeesha, Vidyashree, A. G. S. Gowda and S. Rajanna

Objectives:

- To evaluate the different management practices adopted by farmers to overcome the drought in mulberry cultivation and economic feeding
- To study the adoption level of the scientific drought management technologies popularized by the research institutes and to identify the gaps
- To study the preferences and expectations of farmers from research and extension scientists to overcome the crisis effectively

Study on drought management practices in mulberry sericulture was conducted in Karnataka (Tumkur & Chamarajanagar), Andhra Pradesh (Ananthapur & Kadapa) and Tamil Nadu (Dharmapuri & Krishnagiri districts) covering 600 sericulturists through purposive sampling design with a sample size of 300 farmers. Drought management technologies recommended by various R&D institutions were examined to compile a package for mulberry Drought Management (DMP) module/ practices. Data collection on sericulturists' practices and drought management technologies were collected through specially designed and pre-tested interview schedules by personal interview of the sericulturist farmers.

Integrated Drought Management (IDM) Technology	
Category	Technology
Drought monitoring and forewarning	Establishment of multi-locational experimental fields in drought vulnerable districts
Variation in drought prone areas	Land leveling, Soil testing and sowing of early maturing drought resistant moderate sensitive such as SAU 71, YSR, YCM and YSR 3. Sowing in line with onset of rains
Weather Information	Dissemination of Weather Forecast Information Technology (WIT)
Water conservation and community management	Rainwater Harvesting and recycling. Pond bunds and Arid Bunds should be maintained. Soil testing to be Used Integrated Nutrient Management
Rainwater harvesting	Harvesting rainwater in the ponds, recycling wastewater, runoff water from the farm, pond bunds and bunds
Availability of Nutrients/Fertilizer	Balanced and Judicious Fertilizer Application in time and in adequate quantity
Planting Pit Maximum Soil and Moisture Retention	Single hybrid maize / Maize Intercrop in Red Soils, planting pits across contours to retain the rain water in the pits
Intercropping system	Avoiding pure crop by intercropping with sorghum, pigeonpea, groundnut, sunflower
Agricultural interventions	Avoiding the cultivation of soil exposing crops, Planting soil with cool weather resistant varieties, Planting shallow in heavy soil, Weeding and surface soil mulching, Weeding and surface soil mulching, Using weed control measures, using chemicals as per need
Efficient use of fertilizers	Incorporation of fertilizers using tractor drawn implements
Nursing age management	Proper application of fertilizers according to crop requirement at critical growing stage of crop, application of fertilizers in more number of splits (i.e more frequency of feeding) Foliar use in timely use of an evening foliar spray, harvesting of short duration varieties and crops
Intercropping	Increase frequency of feeding, harvesting of short duration like Red gram and paddy, Covering the nursing bed with old newspaper/paddy straw immediately after feeding until leaf is emerged, Planting pigeonpea
Weed harvesting and preservation	Harvest during water hours of the day, feeding these harvested fodder in proper order like multi-cropping Practices, shade in specific weather conditions, Harvesting after the crop is in the stage, Feeding the fodder of short duration fodder crops
Harvesting and storing care	Maintenance of Temperature and Humidity during the initial 10 hours, Providing ventilation and Harvesting storing to remove the excess moisture

cocoon rates and adoption gaps for all the selected technologies were calculated and adoption gaps were identified to bridge the gap by conducting extension communication programmes. Various communication methods to adopt IDM technologies by individual visits, group discussions, demonstrations and awareness programmes. Field view trips organized on a Handbook on Integrated Drought Management for Mulberry Sericulture in English, Kannada, Telugu and Tamil languages and promoted to the farmers and extension officers. Impact analysis was conducted in the present study, Impact analysis, adoption and gap bridging for some technologies were calculated for significance. Results revealed that, cocoon productivity, cost of cocoon and cocoon rates were selected as measures, indicators to determine the efficiency of IDM technologies. Data collected from high adopters were compared with low adopters and analysed through t-test.

The socio-economic variables were selected to picture the socio-economic profile of farmers, which revealed that the mean experience of sericulture was 19 years, mean age of the farmers was 48 years and 70% respondents were of middle age group (36-55 years). High proportion of respondents (32%) were educated upto high school level,

the mean and coding of respondents was 1.41 as one most nuisance and resting was 4.24. 24% respondents agrees that water resources are one important for carrying out agricultural activities.

Rate of adoption of IDM technologies among the farmers of study area was computed after conducting FGDs and the adoption rate ranges from 4.5% were only 1.22% medium and only 1.22% were high adopters of IDM technologies. reception rate for the individual IDM technologies and adoption also were observed with lower adoption rates of utilizing drought resistant nursery varieties, soil moisture conservation & rain water harvesting. Technology wise extent of adoption at the time of benchmark study showed that only 1/3 of the technologies are said adopted. Important technologies in reaching production as field selling, root covering, splitting soil with compost, hanging water filled earthen pots, practicing furrow on hill, using tree & plants techniques were also adopted which lead to the production of better quality produce. In drought seasons, reaching drought tolerant varieties in time and early sowing of seeds recorded very level of adoption, high level of adoption (72% farmers) in increased feed frequency during drought months, harvesting of nursery around boundaries, transplantation and preservation.

IDM Technology adoption index							
Category	Number of Index	All		Farmers		Non	
Very Low	1-10	1	0.61	1	0.61	0	0.00
Low	11-20	3	20.67	3	20.00	1	20.00
Medium	21-30	1	10.00	1	10.00	1	10.00
High	31-40	1	10.67	1	10.00	1	10.00
Very High	>40	11	20.67	11	20.00	11	20.67

Project Implementation - IDM Technology for Nursery Production
Technology wise Improvement in Adoption

Impact analysis was conducted on the percentage of adoption gaps in the three selected areas. It helped us identified IDM technologies (11) on nursery and (1) on dimension stock; adoption gap was seen in Egaa dominant area region in the dimension technology promoting required attention, harvesting practices (4) value issues of key feeding material & weed management with chemical (1) in plant growth, protecting chemical weight condition, harvesting water & improving shade with pest (1) and recording (1) irregularities of chemical affecting management output. On the other hand, the remaining technologies on both dimension and nursery plots were adopted nearly by the farmers. Implementation of the current project lead to the completely bringing of technologies on dimension plot

adapt to lasting drought conditions such as in Andhra Pradesh. Since it occurs sometimes with a moderate technology adoption has been initiated through repeated extension programmes to the farmers. Statistically highly significant yield and profit gaps ranging from 20 to 40% were observed in the project implementation. Certain technologies like non-lift protection programs and bore well recharging require financial assistance from the state governments, whereas the other technologies like drought resistant nursery, variable green manuring and coiling etc., can be achieved through creation of awareness, understanding and motivation of the farmers. Continuous monitoring of adoption of technologies, assessing through impact models to be carried out in the drought prone areas and capturing the spread of the technologies as well as the benefits of adoption, farmers to combat future droughts are to be effective.

Assessment of Efficiency of ICM Technologies								
Particulars	Post-Kharif			Low Rainfall			Between Farmers	't' Value
	Mean	SD	CV (%)	Mean	SD	CV (%)		
Gross Returns (Rs./ha)	55877	1884.0	33.8	55877.0	1884.0	33.8	8713	0.00**
Cost of Cultivation (Rs./ha)	30000.0	1200.0	33.3	30000.0	1200.0	33.3	7500	0.00**
Net Returns (Rs./ha)	25877	684	2.6	25877	684	2.6	1213	0.00**
Net Returns (Rs./ha)	25877	684	2.6	25877	684	2.6	1213	0.00**

Positive correlation was observed between age and experience of farmers with the adoption index, farming ability and overall economy and with the extent of adoption, while the nature of land holding negatively correlated with the adoption index. Preferences and expectations of farmers from the research and extension scientists to overcome the issues related were enrolled, which include development of drought resistant and high yielding medium duration(70%), encouragement to the availability of quality planting material(60%), development of technical interventions/components suitable for medium plantations & inter-cultivation (55%), monitoring (50%) to locate drought hotspots, access to agro-met (47%) and financial assistance to dig bore well on farm well and farm well recharging (40%).

Impacts/Recommendations: Eighty four percent of farmers reported insufficient water to complete the agricultural activities during the drought period and the assessment study revealed that the extent of adoption of ICM technologies by the farmers to cope up with the situation was only low (3-40%). High adoption gap was observed with accommodative management and non-lift harvesting. CDPs conducted The extent of adoption of ICM technologies increased through the CDPs which in turn helped farmers to improve productivity, profitability and sustainability. Farmers in drought prone areas should be motivated to adopt ICM technologies to overcome the ill effects of drought. Further, there is necessity to conduct studies on the combined effect of ICM technologies on soil moisture management, water use efficiency, soil productivity and system productivity.

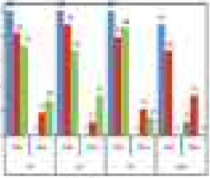
PROJECT CODE: A Study on the impact of pest and disease management practices with effects among the farmers under Crop Promotion Programmes in South India (Jan. 2018 - Dec. 2018)

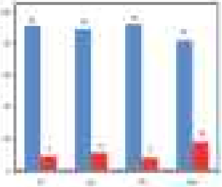
P. Senguttuvel, K. Jayaraj, T. Vidya, Pushpa Kumari and Ramesha

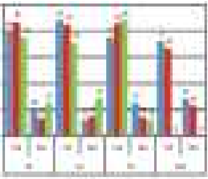
Objectives:

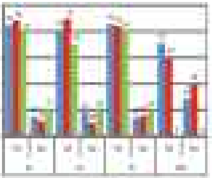
- To study the impact on the adoption level of management practices for pest and disease of multiple and economic importance.
- To study the constraints in adoption of pest and disease management practices

Study on the impact of pest and disease management practices in agriculture among the farmers under Crop Promotion Programme (CPP) in South India was conducted in 17 selected locations in Andhra Pradesh, Karnataka,









The chief measures for the mealybug mulberry pests (pink mealy bug, papaya mealy bug, oleander mealy bug, and other mealy bugs/pests) include cultural methods of clipping and destruction of affected portion was adopted by 44% of all, while chemical measures were as an extent of 44% and biological practices being 12% for the control of pink mealy bugs. In karnataka, the mechanical measures for the control of mulberry pests were to an extent of 68%, chemical measures as 68 % and biological measures as 71 %. The mechanical measures adopted were to an extent of 12%, while chemical and biological measures to an extent of as 44% in tamil nadu. In maharashtra, the mechanical measures were adopted to an extent of 72%, chemical measures as 91.2% and no bio-control measures were adopted.

Scientific conservation adopted and practices applied to overcome diseases in silkworms, in tamil nadu and karnataka. The physical methods for control of soil were followed to an extent of 68% in andhra Pradesh, 88% of the people, 74% in tamil nadu and 44% in karnataka, respectively. The disinfectants control measures for soil by management was to an extent of 64% (1%), 44% (3rd), 44% (3rd) and farmers did not adopt bio-control measures in karnataka.

Impact of population growth and Pesticides: The impact of exposure of rice passage for mulberry diseases reached to significant percentage in the exposure of leaf spot (C. mulberry) from 1.2% to 3%, leaf rust (C. ficus) from 1.5% to 3.25%, powdery mildew (E. cichoracearum) from 1.2% to 2.3%, from 1.2 to 6% root rot (Fusarium) and mulberry root rot was not recorded in andhra pradesh, in karnataka, incidence of mulberry diseases significantly from 2.2 to 4% in case of leaf spot, 2.8 to 3.2% leaf rust), 2.2 to 3% (powdery mildew), 2.2 to 3% (root rot) and was not caused by root fungi(s) and 1.8 (1 to 3.1%) (leaf rust). Mulberry disease incidence significantly reduced from 5.8 to 1.2% in case of powdery mildew and 7.8 to 4.2% (root rot), pink leaf spot, leaf rust and root rot were not recorded in Tamil Nadu. In karnataka, mulberry diseases significantly declined from 2.2 to 1.2% (leaf spot), 2 to 1% (leaf rust), 2.1 to 1.2% (powdery mildew), and 2.1% (root rot) and 2 to 1.2% in case of root rot.

Impact of FCM Pathogens on Mulberry Diseases Incidence

Mulberry Pathogens	Andhra Pradesh			Karnataka			Tamil Nadu			Maharashtra		
	B	A	%	B	A	%	B	A	%	B	A	%
C. mulberry	1.2%	3%	150.0%	2.2%	4.0%	81.8%				2.2%	4.0%	81.8%
C. ficus	1.5%	3.25%	116.7%	2.2%	3.2%	45.5%*				2.2%	4.0%	81.8%*
E. cichoracearum	1.2%	2.3%	91.7%*	2.2%	3.0%	36.4%*	5.8%	1.2%	-79.3%*	2.2%	3.0%	36.4%*
F. solani				2.2%	3.0%	36.4%*	7.8%	4.2%	-46.2%*	2.2%	3.0%	36.4%*
R. solani	6.2%	9.2%	48.4%*	2.2%	3.2%	45.5%*	7.8%	4.2%	-46.2%*	2.2%	3.0%	36.4%*

B: Before, A: After, *Significant @ 5%

The incidence of mulberry pests significantly reduces from 11.2% to 3.4% (scales insects), 4.4% to 2.4% (leaf roller), 2.4% to 1% (thrips), 2.2% to 1.4% in case of other fatty caterpillars, 2.2% to 1.2% (mites) and 2.2% to 1.2% (hairy caterpillars) in andhra pradesh. In karnataka, the pest incidence declined from 2.2% to 1.2% in case of scales, 2.2% to 1.2% (leaf roller), 2.2% to 1.2% (mites), 2.2% to 1.2% (other fatty caterpillars) and 2.2% to 1.2% in case of hairy fly. In Tamil Nadu, the pest incidence decreased from 7.8% to 2.4% in case of scales, 2.2% to 1.2% (papaya mealy bugs/ mealybugs), 2.2% to 1.2% (oleander mealybugs), in maharashtra, the pest incidence declined significantly from 2.2% to 1.2% in case of scales, 2.2% (leaf roller), 2.2% to 1.2% (thrips) and 2.2% to 1.2% (whitefly). The incidence of scales (mealybugs/scales) in all the states, TN and maharashtra. The complete adoption of bio-control measures against papaya mealy bug effectively reduced the incidence in Tamil Nadu, while it was not recorded in AP, Karnataka and Maharashtra.

Impact of IPM technologies on cotton Helicoverpa

Technology / Yield	Arbitrary Area (Ha)			Farmers Yield			Yield Gain			Input Saving		
	T	C	%	T	C	%	T	C	%	T	C	%
Bt Cotton	11.23	0.83	10.40*	11.11	0.83	10.28*	1.00	0.00	10.00*	10.23	0.00	10.23*
Conventional							8.23	0.83	10.40*			
Bt Advantage	0.83	0.83	0.00*	0.83	0.83	0.00*	0.00	0.00	0.00*	0.00	0.00	0.00*
Hybrid	0.00	0.00	0.00*	0.00	0.00	0.00*	0.00	0.00	0.00*	0.00	0.00	0.00*
Bt Hybrid	0.00	0.00	0.00*	0.00	0.00	0.00*						
Bt Advantage	0.00	0.00	0.00*	0.00	0.00	0.00*				0.00	0.00	0.00*

Bt Cotton & Bt Hybrid, * Significant @ 5%

Impact of IPM technologies on Cotton Cotton/Helicoverpa

Technology / Yield	Arbitrary Area (Ha)			Farmers Yield			Yield Gain			Input Saving		
	T	C	%	T	C	%	T	C	%	T	C	%
Bt Cotton	0.00	0.00	0.00*	0.00	0.00	0.00*	0.00	0.00	0.00*	0.00	0.00	0.00*
Hybrid	0.00	0.00	0.00*	0.00	0.00	0.00*	0.00	0.00	0.00*	0.00	0.00	0.00*
Conventional	0.00	0.00	0.00*	0.00	0.00	0.00				0.00	0.00	0.00*
Hybrid	0.00	0.00	0.00*	0.00	0.00	0.00*	0.00	0.00	0.00*	0.00	0.00	0.00*

Bt Cotton & Bt Hybrid, * Significant @ 5%

Overall Impact of all IPM/IRM Technologies Adoption on Cotton Productivity

Technology Parameters	All		Non		Small		Large	
	T	C	T	C	T	C	T	C
Area under Cotton (Ha)	900	0.00*	900	900	700	900	400	700
Yield (Kg/Ha)	11	900	11	11	11	11	11	11
Income (Rs./Ha)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Income (Rs./Ha)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

The adoption of IDM/IPM package against mulberry key diseases/pests resulted in substantial increase in cocoon productivity (20%/ HA) in terms of 20% losses, cocoon yield and income generation in all the four districts.

Ongoing Research Project

ICAR (2016): Development of a decision support for smallholders in rain cocoon sector of Karnataka (2014-2019 - Rs.45.00 lakh)

Economic Impact and Adoption

Objectives: To study and analyse the feasibility of IDMs and socio-economic factors affecting adoption of IDM practices in cocoon sector and develop optimum economic policy for the Cocoon Sector Road

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Livestock rearing centres (Dairy, Poultry, Piggery, Goat & sheep production, Backyard poultry, Commercial egg production and Hatching) with the interventions selected for the study in AP, TS and Karnataka states. Separate structured tools prepared for data collection from each self-employed unit pre-testing was done. Various parameters like profile of enterprise, farmers input usage, recommended size adoption of technology, investment cost, Annualized investment cost, Input & output relationship, viability, efficiency, financial feasibility, income returns, repayment capacity, risk bearing ability, etc), marketing (product price, price promotion and managerial aspects (planning, challenges faced, existing opportunities, weaknesses & weaknesses, strengthening and upscaling procedures) so considered to collect the primary sample size (10 undertake pilots). Data collection was limited to the evaluation of appropriate techniques models.

Dairy Promotion Programme (DPP)

Table	[illegible]		
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Dairy Promotion Programme is being implemented by Dairy [illegible] in collaboration with the Department of Agriculture [illegible] of respective states in the Southern Zone viz., Karnataka, Andhra Pradesh, Telangana, Tamil Nadu, Kerala, Maharashtra and Madhya Pradesh. Under [illegible] [illegible] (Milk routes (FP routes) & FL packing). The main objective of establishing the clusters is to promote livestock wise milk production to a level of [illegible] by the end of XII plan (2012-17). Clusters are organized based on farmers profile and potentiality. Each cluster is monitored primarily by Cluster Development Facilitators (CDFs), who work coordinated by Dairy Development Officers and State Department of Agriculture.

Cluster Development Facilitators (CDFs)

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Anmeldung	Speichert Anmeldedaten für Login	Cookie
Sprache	Speichert die gewählte Sprache	Cookie
Session	Identifiziert eine Benutzersitzung	Cookie
Suchfilter	Speichert Suchfilter	Cookie
Ansicht	Speichert die Ansichtseinstellung	Cookie
Warenkorb	Speichert Artikel im Warenkorb	Cookie
Lieferadresse	Speichert Lieferadresse	Cookie
Zahlungsart	Speichert gewählte Zahlungsart	Cookie
Newsletter	Speichert Newsletter-Anmeldung	Cookie
Kundenkonto	Speichert Kundenkonto-Daten	Cookie
Warenkorb	Speichert Warenkorb	Cookie
Suche	Speichert Suchbegriffe	Cookie
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The district under the UPP scheme also at [illegible] achieved a record increase in oil production amounting to [illegible] with [illegible] achievement against the target of [illegible] during the year. The increase in [illegible] oil production a result of [illegible] over the previous year further a quantity of [illegible] despite the [illegible] was also produced in the non-[illegible] areas. In the commercial [illegible] of [illegible]. The role of [illegible] in the [illegible] was production in the country [illegible] [illegible] the UPP [illegible] and [illegible] [illegible] production in the country.

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Performance of Clusters

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Performance of Integrated Cluster - Dairy Sector (in Production) (2016-17)

Cluster	Milk Collection			Value Addition (Rs. Lakh)	Sale of Milk Products (Rs. Lakh)				Total Employment Generated (Nos.)
	Target (Lakh Ltrs)	Achievement (Lakh Ltrs)	Ach. (%age)		Target	Ach.	Ach. (%)	Increase over 2015-16 (%)	
Bhuj	1.20	1.10	91.67	75.00	12.00	11.07	92.25	15.00	
Himatnagar	1.40	1.20	85.71	84.00	14.00	13.00	92.86	18.00	1,40,000
Deesa	1.50	1.30	86.67	78.00	15.00	13.50	90.00	17.00	
Jamnagar	1.10	0.95	86.36	66.50	11.00	9.80	89.09	12.00	
Rajkot	1.60	1.40	87.50	91.00	16.00	14.80	92.50	20.00	1,60,000

Performance of Individual Cluster - Dairy Sector (in Production) (2016-17)

Cluster	Milk Collection			Value Addition (Rs. Lakh)	Sale of Milk Products (Rs. Lakh)				Total Employment Generated (Nos.)
	Target (Lakh Ltrs)	Achievement (Lakh Ltrs)	Ach. (%age)		Target	Ach.	Ach. (%)	Increase over 2015-16 (%)	
Ahmedabad	1.80	1.65	91.67	99.00	18.00	16.83	93.50	14.29	1,80,000
Anand	2.20	2.05	93.18	123.00	22.00	21.12	96.00	16.00	2,20,000
Banaskantha	1.60	1.45	90.63	87.00	16.00	14.88	93.00	13.00	1,60,000
Bardoli	1.30	1.20	92.31	72.00	13.00	12.09	93.00	11.00	1,30,000
Bhuj	2.10	1.90	90.48	114.00	21.00	19.32	92.00	15.00	2,10,000
Dahod	1.50	1.38	92.00	82.80	15.00	14.10	94.00	18.00	1,50,000
Deesa	1.90	1.75	92.11	105.00	19.00	17.85	93.95	14.00	1,90,000
Himatnagar	1.40	1.28	91.43	76.80	14.00	13.02	93.00	12.00	1,40,000
Jamnagar	1.10	1.00	90.91	70.00	11.00	10.23	93.00	10.00	1,10,000
Kheda	2.50	2.30	92.00	138.00	25.00	23.50	94.00	17.00	2,50,000
Mehsana	2.80	2.60	92.86	156.00	28.00	26.60	95.00	19.00	2,80,000
Modasa	1.70	1.55	91.18	93.00	17.00	15.81	93.00	13.00	1,70,000
Palanpur	1.60	1.48	92.50	88.80	16.00	15.04	94.00	16.00	1,60,000
Rajkot	1.60	1.45	90.63	87.00	16.00	14.80	92.50	20.00	1,60,000
Surat	2.00	1.85	92.50	111.00	20.00	18.90	94.50	14.00	2,00,000
Vadodara	2.40	2.22	92.50	133.20	24.00	22.68	94.50	15.00	2,40,000
Vijapur	1.90	1.75	92.11	105.00	19.00	17.85	93.95	14.00	1,90,000
Visnagar	1.50	1.38	92.00	82.80	15.00	14.10	94.00	18.00	1,50,000
Vyara	1.20	1.08	90.00	75.60	12.00	11.16	93.00	12.00	1,20,000
Wadhwan	1.30	1.20	92.31	72.00	13.00	12.09	93.00	11.00	1,30,000
Warana	2.10	1.95	92.86	117.00	21.00	19.74	94.00	17.00	2,10,000
Wayanad	1.10	1.00	90.91	70.00	11.00	10.23	93.00	10.00	1,10,000
Yavatmal	1.00	0.90	90.00	63.00	10.00	9.20	92.00	9.00	1,00,000
Zahirabad	1.40	1.30	92.86	78.00	14.00	13.16	94.00	16.00	1,40,000
Zunjarwad	1.50	1.38	92.00	82.80	15.00	14.10	94.00	18.00	1,50,000
Total	45.00	41.50	92.22	2,490.00	450.00	423.00	94.00	15.00	45,00,000

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(in Rs.)

District	Oil Distribution			Total Oil Distribution (KL)	Non Oil Production (KL)				Non Judicial Stamp Revenue*
	Target (KL)	Sales (KL)	Ach. (%)		Target	Ach.	Ach. (%)	Increase over 2015-16 (%)	

Performance of Kerosene Dealers – Kerosene Oil Distribution (2016-17)

Dealer	Oil Distribution			Total Oil Distribution (KL)	Non Oil Production (KL)				Non Judicial Stamp Revenue*
	Target (KL)	Sales (KL)	Ach. (%)		Target	Ach.	Ach. (%)	Increase over 2015-16 (%)	

Performance of Dealers in Chakia Block for Oil Distribution (2016-17)

Dealer	Oil Distribution			Total Oil Distribution (KL)	Non Oil Production (KL)				Non Judicial Stamp Revenue*
	Target (KL)	Sales (KL)	Ach. (%)		Target	Ach.	Ach. (%)	Increase over 2015-16 (%)	

Performance of Hatcheries (Hatchery Quality) - [illegible] (2016-2017)

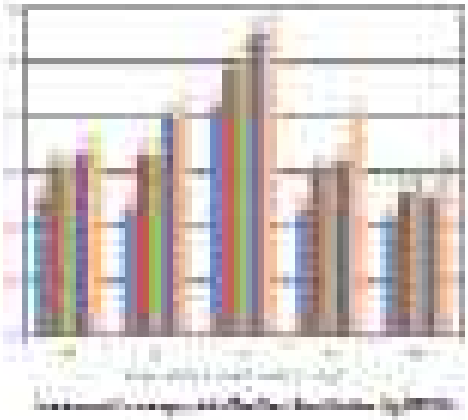
Hatchery	Fry Distribution			Total Seed Production (Nos)	Year Wise Production (Nos)				Fry Stocking Density (Nos/ha)
	Target (Lakhs)	Achieved (Nos)	Ach. (%)		Target	Ach	Ach. (%)	Increase over 2015-16 (%)	
Kakinada	3.00	3.00	100.00	48.00	22.00	21.00	95.45	5.00	10000-15000
Bhimavaram	3.00	2.71	90.33	43.36	7.00	6.00	85.71	3.00	
Machilipatnam	2.00	2.00	100.00	32.00	7.00	6.00	85.71	2.00	
Nellore	3.00	2.80	93.33	44.80	7.00	6.00	85.71	3.00	
Total / Avg	11.00	10.51	95.55	168.16	43.00	39.00	90.70	13.00	

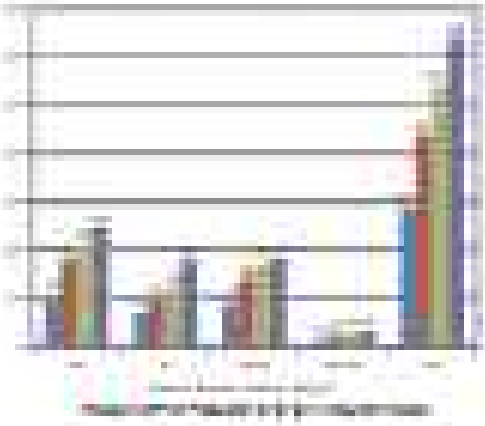
Various IEC (Information, Education, Communication) and Capacity Building programmes, exposure visits, workshops were conducted in the operational areas periodically and the farmers were updated on the new technologies in hatchery production. These programmes helped in motivating the farmers and adopt improved technology for improved productivity in shrimp and fish production.

The clusters in the south zone are coordinated and monitored by the Director (CIFE) Mumbai who made efforts to pay for effective implementation of CIA. The cluster base-wise hatchery progress is available from the zone and analysis. A total of about 300 crore seed distributed to the farmers against the target of 280.00 crore, 107.00% achievement and the stocking capacity of farmers increased by 10.00% due to continuous and effective monitoring of hatchery operations. A total of 10000 SMART brooders systems were installed from 277 all hatcheries with an average output (Nos) of 15.00 lakh/100 sq.

Brooding Year Cycle Production - Cluster Promotion Programme under CIFE Mumbai (2016-17)

Hatchery	Target (Lakh Nos)	Production (Lakh Nos)	Ach. (%)	Increase (%)	Investment (Rs. 000'Lakh)	Annual Expenditure (2015-16) (Rs. Lac)				
						Q1 Sept	Oct-Dec	Jan-Mar	Apr-Jun	Jul-Aug
Vannamei	1000.00	1000.00	100.00	100.00	10.00	250.00	250.00	250.00	250.00	250.00
Indian Prawn	500.00	500.00	100.00	100.00	10.00	125.00	125.00	125.00	125.00	125.00
Mangrove	500.00	500.00	100.00	100.00	10.00	125.00	125.00	125.00	125.00	125.00
Monodon	400.00	400.00	100.00	100.00	8.00	100.00	100.00	100.00	100.00	100.00
Others	100.00	100.00	100.00	100.00	2.00	25.00	25.00	25.00	25.00	25.00
Hatcheries	1000.00	1000.00	100.00	100.00	20.00	250.00	250.00	250.00	250.00	250.00
Total / Avg	3500.00	3500.00	100.00	100.00	60.00	875.00	875.00	875.00	875.00	875.00





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[illegible] Village Linkage Programme [illegible]

Objective: Transfer of technology through Institute Village Linkage Programme (IVLP) for [illegible] cocoon production.

IVLP was [illegible] with 1200 identified farmers covering about 500 acres of mulberry plantation.

State	Cluster	Scientist
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Performance of the Centre

State	...	...	...	...	...	...	...
	...	...	...	...	...	...	...
Andhra	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...
Meghalaya	...	...	...	...	...	...	...
Chhattisgarh	...	...	...	...	...	...	...
Uttarakhand	...	...	...	...	...	...	...
Tamilnadu	...	...	...	...	...	...	...
Nagaland	...	...	...	...	...	...	...
Chandigarh	...	...	...	...	...	...	...
Chandigarh	...	...	...	...	...	...	...
Mizoram	...	...	...	...	...	...	...
Himachal	...	...	...	...	...	...	...
Total	...	...	...	...	...	...	...

Continuous/Mass Activities

Mahatma Gandhi Bhagyodaya (MGB), Mahatma Gandhi Bhagyodaya Programme (MGBP) were conducted in Andhra Pradesh, Assam, Arunachal Pradesh, Telangana, Kerala, Maharashtra and Madhya Pradesh through MGBs, MTTs and RTMs in close coordination with the State Departments of Sericulture and CSRTI Mysuru. Farmers were benefited on new practices, sericulture technologies through MTMs and major topics covered were popularization of new mulberry varieties and rearing, its importance on mulberry silkworm, popularization of new mulberry leaf protect for mulberry, silk integrated disease management practices, disinfection & hygiene in silkworm rearing, popularization of new silkworm hybrids, demonstration of rearing equipments, mounting & spinning and etc.

...	...	...
Silkworm Commercial	...	...
...	...	...
Cocoon/Pupae Disposal	...	...
...	...	...
...	...	...
Farmers Day	...	...
Technical Field Visits	...	...
...	...	...
Cocoon Awarding	...	...
Seminar/Farmers Day	...	...
Total	...	...

Others

- ...
- ... Disease Free Egg ...
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In Bihar, Bhagalpur Silk is one of the farmers in conducting campaign across the state particularly through Krishi Vigyan Kendra (Ministry of Agriculture, Govt. of India), 4 days of 32 Campaign covering various farmers in Jamalpur, Mr. Nalanda, Tej, Khagaria and Mr. were sent during the year as a part of the programme with academic feedback.

Technical Resource Centers: Technical and financial support was extended to the identified progressive sericulture farmers in Karnataka (Kolar, Madakasira, Tq., Chikkaballapur & K.G.Doddi, Ramagiripura) and Tamil Nadu (Hosakote, Krishnagiri, Thoppur) for establishing four Sericulture Resource Centers (SRC) for training of sericulturists/ reelers. The SRCs are well equipped with the infrastructure facilities and already initiated training programmes.

Infrastructure Assistance to Growth Nursing Centres: (CIPHET) During 2020-21, assistance infrastructure assistance of Rs. 10.00 lakhs each to establish Pre Growth Nursing Centres(PGNC) with planting capacity 10000/- plants per annum for supply of horticultural plants/ plantation farmers of CIPHET Regional Stations in Karnataka and Andhra Pradesh. An amount of Rs. 6 lakhs each PGNC equipments viz., Plastic trays, PVC shade netting sheets, 2 HP submersible pump, Rainfed cum water soluble fertigation machine, Insulation material and Greenhouse cum fog cooling machine were purchased and supplied to each unit.

Skilled Farmers Identified: CIPHET-Krishi Vigyan Kendra as a premier agriculture extension institute makes the selection of progressive farmers similar to the survey. Likely agriculture farmers, students from all over the country and foreign nationals visits the institute to learn new and update on the recent innovations in agriculture.

Sub.	Farmers	Students	Officers	Total
Horticulture	2004	900	240	3144
Farmers	97	180	30	307
Plant Pathology	420	307	32	759
Entomology	71	70	7	77
Seed & Planting	32	2	3	37
Agronomy & Soil Sc.	31		20	51
Fruit Science	94		3	97
Post Harvest	91		6	97
Farming & Agriculture		9	1	9
Miscellaneous	11		3	11
Total	2751	1468	351	4570

Agricultural scientists, technologists, agriculture entrepreneurs, extension workers, progressive farmers, students, officials of state agriculture departments and representatives of cooperative banks from all over the country visited the institute to learn new and update on the recent innovations in agriculture. Scientists of the institute delivered lectures on various aspects of horticulture, plant protection, post harvest technology, value addition, protected cultivation, seed production, organic farming, farm mechanization, etc. Besides, scientists also visited farmers' fields to provide on-spot guidance to the farmers.

Technology Exhibition: CIPHET-Krishi Vigyan Kendra organized a Farmers Workshop-cum-Technology Exhibition on the theme "Postharvest Practices to Increase Self-Sufficiency" on 27th February, 2021 at Doddaballapur, Bangalore Rural District. Around 2000 farmers across various districts of Karnataka and scientists participated in the programme. Various technologies developed by the Institute were exhibited. Dr. Jagannath Patil, Director, CIPHET, Abohar was the Chief Guest of the programme. A group discussion session was also organized wherein new technologies/ products/ tools/ machinery/ practices/ policies developed by the Institute were explained. Dr. Jagannath Patil, Director, CIPHET, Abohar was the Chief Guest of the programme. A group discussion session was also organized wherein new technologies/ products/ tools/ machinery/ practices/ policies developed by the Institute were explained. Dr. Jagannath Patil, Director, CIPHET, Abohar was the Chief Guest of the programme. A group discussion session was also organized wherein new technologies/ products/ tools/ machinery/ practices/ policies developed by the Institute were explained.

Technology Exhibits Themes

- Decision Support Tool-Integrated Post Harvest Technology (DST-IPHT)
- Post harvest Management Practices for Fruits and Vegetables
- Value Addition and Processing Technologies for Fruits and Vegetables
- Protected Cultivation Technologies for Horticultural Crops
- Post Harvest Technology for Cereals, Pulses and Oilseeds
- Farm Mechanization Technologies for Horticultural Crops
- Precision Farming Technologies for Horticultural Crops
- Integrated Pest Management Practices for Horticultural Crops
- Organic Farming Practices for Horticultural Crops
- Seed Production Technologies for Vegetable Crops
- Nursery Management Practices for Horticultural Crops
- Micro Irrigation Technologies for Horticultural Crops
- Soil and Water Conservation Practices for Horticultural Crops
- Integrated Nutrient Management Practices for Horticultural Crops
- Integrated Farming Practices for Horticultural Crops
- Protected Cultivation Technologies for Horticultural Crops
- Seed Production Technologies for Vegetable Crops
- Nursery Management Practices for Horticultural Crops
- Micro Irrigation Technologies for Horticultural Crops
- Soil and Water Conservation Practices for Horticultural Crops
- Integrated Nutrient Management Practices for Horticultural Crops
- Integrated Farming Practices for Horticultural Crops

Farmers in attendance were exposed to multi-technology access to agriculture under different categories by the participants of workshop.

Maharashtra: FIET Researcher organized Technical Workshop on Agro village in coordination with Soft Technologies on 15/09/2016. Agriculture Workers (ASW) across Maharashtra participated in the programme and gained information through Solution exhibition on new technologies for achieving higher productivity and reduction post-harvest losses.

Tamil Nadu: FIET Trichy organized Technical Workshop on "Mobile Application for Agricultural Extension" on 12.10.2016. Around 150 farmers/officials including entrepreneurs attended the programme. Two books "Food based Technologies in Horticulture" and "Technologies for Smallholder" were released on the occasion. Best agriculture farmers from the region were also honoured on the occasion.

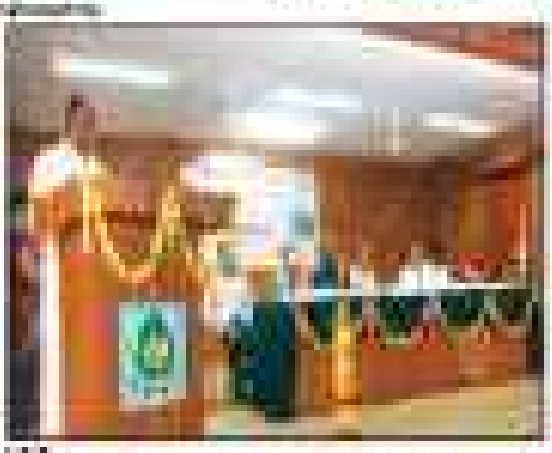
Andhra Pradesh: Sub-Committee organized agriculture technical workshop on "Mobile applications for sustainable income in extreme weather – Technologies for enhancing productivity" on 28th March 2017 in collaboration with Polavaram Left Bank Canal farmers from AP participated in the programme benefited from the presentations and exhibition. The workshop also introduced the impact of a book "Capsicum Cultivation under Protected Cultivation – scientific considerations" compiled in simple manner for the benefit of the agriculture officials.

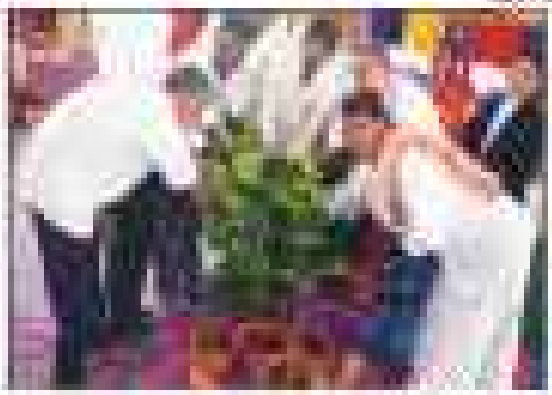
Telangana: ICAR-CIAE has organized a technical farmers' workshop on "Mobile applications for sustainable income in Telangana – Technologies for enhancing productivity" on 22nd February 2017 in Tandoor in collaboration with Department of Agriculture & Horticulture-Telangana. Around 100 farmers across Telangana besides scientists/officials attended the programme. A publication exhibition was also organized wherein new technologies/ products/literature/publications were exhibited for the benefit of farmers/officials. The workshop was culminated the release of a book "Capsicum Cultivation under Protected Cultivation – Scientific considerations" compiled in simple manner for the benefit of agriculture officials.

Madhya Pradesh: ICAR-Mission Directorate Programme (FIET-Mission) sponsored a Farmers Technical Workshop for increasing agricultural income under "Mechanization" in Krishi Vigyan Programme. 39 agriculture (AT) extension workers (Extensionists) of ICAR-FIET from 5th May to 20th September 2017 were trained/oriented. The programme was inaugurated on March 8th 2017 at FIET-Mission in coordination with ICAR-Mission and Soft-Technologies.

Jammu: Overseas Cooperation Volunteer Programme (OCVP), Japan Overseas Cooperation Volunteers programme (JOCV) was initiated during January 2017 mainly to support Soil Conservation activities including regarding soil-improvement (Soil/Cultivation) practices. These JOCVs are currently posted/engaged in Directorate of Agriculture (AT), Kathua and Directorate of Agriculture (AT), Rajouri and Reasi. The Cultivars Free Drills are already released and are functional in agriculture activities and farmers were enlightened through extensive programmes and field tours.

Andaman Nicobar: ICAR-CIAE, Port Blair Centre started work during 2016-17 under Tribal Sub-Plan programme. Each village adopted Bakultala Village (Mayabunder Tehsil) with an aim for the overall development of village including health camps and education on hygiene. The programme was formally inaugurated on 30.12.2016 and which aspect a Solar Lighting Kit per each household cover 150 school children, teachers, women self-workers, Gaon Bura, NGO officials participated in the programme on the occasion. Interactive sessions on personal hygiene and cleanliness were conducted besides distributing personal hygiene products and basic first-aid kits as support was provided to the schools.





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CAPACITY BUILDING AND TRAINING

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Training Programme	Courses	Duration (days)
Technology Orientation programme (TOP)	Oilseeds Training	10
	Production of Bio-Control Agents	5
	Vegetable Crops	5
	Integrated Pest & Disease Management	5
	Hybrid Seed Production & Organic Farming	5
	Turf Technology	10
	Orientation Programme	5
Farmers' Skill Training (FST)	Oilseeds Training	10
	Cultivation of Oilseeds Training	10
	Vocational Programme	5
Youth Skill Training (YST) Off Campus	Training in Sericulture	10
	Foundation Training in Sericulture	10
	Orientation Programme on Vocational Training	5
Youth Skill Training (YST) Campus	Oilseeds Training	10
	Cultivation of Oilseeds Training	10
	Vocational Training in Horticulture	10
	Vocational Programme	5
	Commercial Oilseeds Training	10
	Cultivation of Oilseeds Training	10

Training of Overseas Participants:

The Indian Institute of Oilseeds Research has been organizing training programmes for overseas participants sponsored by Indian Council of Agricultural Research (ICAR), Ministry of External Affairs (MEA), Government of India, New Delhi and Indian Council of Agricultural Research - National Agricultural Research Management (ICAR-NARM), Hyderabad. The Institute has successfully conducted 24 training programmes in the area of Oilseeds Production Technology, Seed Production Technology, Integrated Pest Management, Integrated Nutrient Management, Post Harvest Technology, Value Addition and Entrepreneurship Development for 24 batches of participants from 24 countries in Asia, Africa and Latin America. The details of training programmes conducted and participants trained are given in the following table.

Programme	Sponsored by	Duration (days)	Year	Participants							
				Afghanistan	Bangladesh	Ethiopia	Kenya	Myanmar	Nepal	Sudan	Total
OTP	ICAR-NARM	21	2016	1	1	1		1	1	1	5
OTP		21	2017	1	1	1	1				4
OTP	MEA, GOI	21	2016	1	1	1		1			4
OTP		21	2017	1	1	1		1	1	1	6
OTP		21	2016	1						1	2
OTP		21	2017	1	1	1	1	1	1	1	7
OTP		21	2016	1	1	1	1	1	1	1	7
OTP		21	2017	1	1	1	1	1	1	1	7
OTP		21	2016	1	1			1			3
OTP		21	2017	1	1			1			3
AT	MEA, GOI (Sponsored)	21	2016	1				1			2
AT		21	2017	1				1			2
Total				12	8	5	2	9	3	5	44

OTP: Overseas Training Programme; AT: Advanced Training; MEA: Ministry of External Affairs; GOI: Government of India

Training in Commercial Oilseeds Sourcing for Industrial Professionals

The programme is designed to train corporate professionals who wish to establish Commercial oilseeds centers. The 10 days programme includes classroom sessions on technologies involved in oilseeds processing, oil/fats refining, value addition, crop protection, environmental and economics of oilseeds trading. The participants are trained in oilseeds processing such as crop up to the successful completion of training a mandatory for registration of Entrepreneurs and Micro Enterprises (Ministry of MSME). The Academy is also conducting training programmes on Oilseeds Production Technology, Seed Production Technology, Integrated Pest Management, Integrated Nutrient Management, Post Harvest Technology, Value Addition and Entrepreneurship Development for the farmers, rural youth and extension functionaries. During the year, 1 training programme was conducted and 25 participants were trained.

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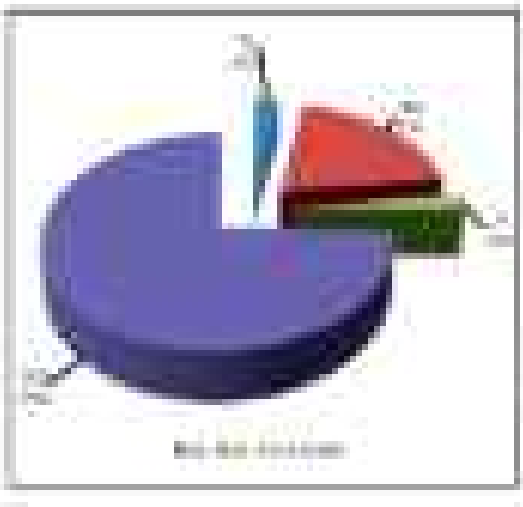

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FARM MANAGEMENT SECTION

Staff Associates

Technical Activities

- Maintained all farm machinery, general including tractors, boat, diesel engines for production of quality mulberry leaf with required package of practices and provided all farming operations.
- Involved in general upkeeping and maintenance of the silkworm rearing and mulberry cultivation.
- Supplied 10,000kg mulberry leaf and 15,000kg mulberry grass for the silkworm rearing [1400 dfls] under different stages, experimental maintenance programmes in Silkworm breeding & Genetics, Physiology, Pathology, RSRI, TNAU and Training divisions.
- Supplied 12,000kg shoot leaf to Model Commercial Chawki Rearing Centre for quality cocoon rearing [12000 dfls] and supply of mulberry to the farmers.
- Supplied mulberry saplings [i.e. 40,000 no. of mulberry saplings to the farmers, 10,000 no. of mulberry saplings to the farmers, 20,000 nos. of UPASI-10 saplings, 70,000 nos. of mulberry saplings for establishing new plantations.
- Maintained revenue of Rs.4 lakh more through sale of mulberry saplings, grain grass and cocoon cocooning etc.

BIOINFORMATICS CENTRE [sub DIC under BTI/DBT]

V. Sangeetha (Coordinator), K. Shanthi Nair (Co-Coordinator) and R. Sureshy

The Bioinformatics Centre at TNAU, Madurai was established in November 1999 as Sub DIC under BTI/DBT, GOI. It mainly caters to the needs of the scientific community in the fields of Education, Research and Development in the areas of Bioinformatics and Biotechnology. In the Institute it is also more often used as a resource centre for students and scientists. The center has worked as a catalyst for bringing out the awareness in Bioinformatics among the students, scientists and researchers of various colleges, research institutes and biotechnology industries in and around the region thus contributing significantly for the human resource development in the field of Biotechnology and Bioinformatics.

M.Sc. Bioinformatics course has been started during 2001-02 to offer in-depth and comprehensive knowledge in the area of Bioinformatics and its applications in Biotechnology. The course is offered by the Department of Biotechnology, Agricultural College and Research Institute, TNAU, Madurai. The first batch of students have completed their course successfully and the second batch of students are undergoing their course. The Bioinformatics Centre has been actively involved in the training programmes in Bioinformatics and its applications in Biotechnology. The Centre has conducted 3 training programmes in Bioinformatics and its applications in Biotechnology for the benefit of the scientists, teachers and students from various colleges and research institutes. The Centre has also conducted a training programme in Bioinformatics and its applications in Biotechnology for the benefit of the scientists, teachers and students from various colleges and research institutes. The Centre has also conducted a training programme in Bioinformatics and its applications in Biotechnology for the benefit of the scientists, teachers and students from various colleges and research institutes.

Database (Software, URL, Organization)	
Database	URL
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
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[illegible]	[illegible]

REGIONAL HORTICULTURAL RESEARCH STATIONS (RHRS)

Regional Horticultural Research Stations (RHRS) are established to address the regional problems of horticulture through research & extension support of horticulture technologies in various agro climatic regions. Their main objective includes undertaking validation trials & demonstration of new horticulture technologies evolved by the main Institute [illegible]. The proven technologies are transferred further to the field through Research Extension Centres (REC's) [illegible] functioning under RHRS.

RHRS-[illegible]

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	Staff	
[illegible]	[illegible] • [illegible] • [illegible]	
[illegible]	[illegible]	[illegible]
	[illegible] Staff	[illegible]
	Administrative Staff	[illegible]

Farm Based Units		
Unit	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]

Ongoing Research Project

[illegible]: Impact of CPP on horticulture development in North Karnataka ([illegible])

[illegible]

Objectives:

- To study the impact of CPP on technology adoption and productivity improvement of horticulture in North Karnataka
- To study the impact of CPP on socio-economic development of horticulturists in North Karnataka
- To study the technological efficiency in impact of CPP

Based on the literature survey and discussions with the experts, the questionnaire for data collection for studying the impact of CPP on technology adoption, productivity improvement, socio economic development of horticulturists and technological efficiency in North Karnataka was finalized. Data collection from [illegible] of big, medium and small [illegible] was initiated.

Collaborative Research Projects/Programmes: [illegible] are involved in the data collection for the following collaborative projects with the main Institute and other RHRS.

Project Code	Title	Centre
[illegible]	Assessment of the impact of crop and resource management practices on productivity and profitability of [illegible] cropping systems in [illegible]	ICAR-[illegible]
[illegible]	Study of the salt tolerance mechanism in [illegible] varieties	ICAR-[illegible] ICAR-[illegible]
[illegible]	Development and validation of [illegible] for [illegible]	ICAR-[illegible] ICAR-[illegible]
[illegible]	Implementation of [illegible] as a new model for management of [illegible]	ICAR-[illegible]
[illegible]	Validation and use of [illegible] for [illegible]	ICAR-[illegible]
[illegible]	Evaluation of [illegible] with special reference to [illegible]	[illegible]
[illegible]	Identification, characterization, [illegible] and field evaluation of [illegible]	ICAR-[illegible]
[illegible]	Soil health cards for agriculture farmers in district of [illegible]	ICAR-[illegible]
[illegible]	[illegible]	ICAR-[illegible]
[illegible]	Development of [illegible]	ICAR-[illegible]
[illegible]	[illegible]	ICAR-[illegible] [illegible]
[illegible]	[illegible]	ICAR-[illegible]

Soil health cards for agriculture farmers in district of Kamrup (in collaboration with CSFR Nagpur)

(Apr. 2020 – Mar. 2021)

Parameter	Sample 1 (Unit)	Normal Range	Observed Range
pH	[illegible]	[illegible]	[illegible]
EC (electrical conductivity)	[illegible]	[illegible]	[illegible]
OC (%)	[illegible]	[illegible]	[illegible]
Nitrogen (N) kg/ha	[illegible]	[illegible]	[illegible]
Phosphorus (P) kg/ha	[illegible]	[illegible]	[illegible]
Potash (K) kg/ha	[illegible]	[illegible]	[illegible]
Boron (B) ppm	[illegible]	[illegible]	[illegible]
Sulphur (S) ppm	[illegible]	[illegible]	[illegible]

Model Installation Programme (CFP)

[illegible] [illegible] were [illegible] in 10 clusters across Kamrup and a total of 2000 soil samples might [illegible] with [illegible] agricultural agencies [illegible] were [illegible]. The average [illegible] was [illegible] kg/ha, [illegible] kg/ha and [illegible] kg/ha were produced against the target of [illegible] MT.

Crop	Parameters	Target	Unit	Achievement (%)
[illegible] cassava (Cv-Kamrup)	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	
[illegible] cassava (Cv-Kamrup)	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]	

On Station Trials

Performance of Improved Cross Genotypes

In Jagtial, Nirmal, Karimnagar and Warangal

Three crop cross combinations (CRH 1 x CRH 2, CRH 1 x RCH 2 and CRH 2 x RCH 2) were tested along with popular checks (CRH 1 x RCH 2) across the state and analysed. RCH 2 x RCH performed better for both seed and cotton yield. Plant height, boll density and fibre quality were also found to be good in this cross combination.

Performance of improved cross genotypes (across all trials)									
Hybrid	Seed cotton yield (kg/ha)		Ginning out turn (%)	Boll weight (g)	Fibre length (mm)	Fibre strength (g/tex)	Micronaire value	Fibre elongation (%)	Fibre uniformity index
	Pooled	Irrigated							
CRH 1 x RCH 2	1800	2100	34.5	3.8	30.5	28.5	4.5	6.5	85
CRH 2 x RCH 2	1950	2300	35.2	4.0	31.0	29.0	4.3	6.8	86
RCH 2 x RCH	2100	2450	36.0	4.2	31.5	29.5	4.2	7.0	87
Check (RCH 2)	1700	2000	34.0	3.7	30.0	28.0	4.6	6.3	84
Check (Local)	1500	1800	33.5	3.5	29.5	27.5	4.8	6.0	83
CD (5%)	210	250							
SE (m)	75	90							

Continuous Effort Activities

Popularization of New Released Hybrids and Mulberry Activities: Newly developed Kosuna hybrids (Kosuna 2in1 & 3in1 CRH) were tested on 2 ha each with 50 MSE (R), with 100 Kg basal and 3 top dressings. Technical guidance was provided as a part of popularization. Mulberry new mulberry varieties (V1, RFS, Dhanvi Varieties) saplings/cuttings were supplied to the farmers.

Activity	No. of Units	Farmers Benefited	Income Gain (Rs/100 Rs)		Unit	Mulberry Variety	Details
			BY	TG			
Mulberry Saplings	4,000	81	150	124	Mulberry saplings	V1	1000 saplings @ 2 Farmers
Mulberry Saplings	3000	30	210			RFS	1000 saplings @ 2 nos of Saplings & 1000 Cuttings
Mulberry Cuttings	1000	50	180	110		Dhanvi	2000 cuttings @ 2 Farmers Dhanvi Mulberry
Mulberry Cuttings	2000	40	200			V1	2000 @ 2 farmers
RCH 2 x Parent seed	500	100	180		Hybrid Seed (Kosuna)	BY	1 Kg Seed @ 2 Farmers Demonstration
RCH 2 x Parent seed	500	50		124			
Hybrid Seed	10000	100	1200	1100	Hybrid Cocoon	BY	2 Farmers @ 2 Farmers

Institute Mega Seed Programme (IMSP): 10000 Quintal hybrid (R) seed raised against the target of 8000 Qtl and procured an average yield of 30 MT/ha (135 Qtl), which is an improvement of 12.5% over the yield last harvested.

Production of biological Control agents: 2 Quintal of Trichoderma viride were produced and supplied to Horticulture for the management of Anthracnose in RCH Mulberry.

Establishment of Model Orchard: Micro Irrigation Technology (Drip) for Mulberry) and drip irrigation system and demonstrations created and also technologies to mitigate drought situation, cultivation details of Mulberry at RCH Ganguapur was also maintained well.

Agro Processing Centre (APC) Programme: The APC Programme is implemented in the form of Special Purpose Vehicle (SPV) with participation of Government of India, State Government and Private Entrepreneurs. The APC Programme is implemented in the North Eastern States, Himachal Pradesh, Uttarakhand, Jammu & Kashmir, Andaman & Nicobar Islands and Lakshadweep. The Programme is implemented in the form of Special Purpose Vehicle (SPV) with participation of Government of India, State Government and Private Entrepreneurs. The Programme is implemented in the North Eastern States, Himachal Pradesh, Uttarakhand, Jammu & Kashmir, Andaman & Nicobar Islands and Lakshadweep.

Unit	Name	Agro Processing Centre (APC)										Total	
		Mega Food Park		Integrated Cold Chain		Value Addition Infrastructure		Backward Linkage		Creation / Expansion			
		No.	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount	No.	Amount
[illegible]	[illegible]	1	[illegible]			1	[illegible]					2	[illegible]
	[illegible]	1	[illegible]	1	[illegible]	3	[illegible]	1	[illegible]			6	[illegible]
	[illegible]	1	[illegible]			1	[illegible]		[illegible]			2	[illegible]
	[illegible]	1	[illegible]		1 (2.00)	1	[illegible]					3	[illegible]
	[illegible]	1	[illegible]			1	[illegible]					2	[illegible]
	[illegible]	1	[illegible]			1	[illegible]	1	[illegible]		[illegible]	3	[illegible]
[illegible]	[illegible]	1	[illegible]	1	1 (1.00)	1	[illegible]	1				4	[illegible]
[illegible]	[illegible]	1	[illegible]	1	[illegible]	1	[illegible]	1	[illegible]			4	[illegible]
	[illegible]	1	[illegible]			1	[illegible]					2	[illegible]
	[illegible]	1	[illegible]			1	[illegible]					2	[illegible]
[illegible]	[illegible]	1	[illegible]	1	1 (1.47)	1	[illegible]	1	[illegible]	1	1 (1.00)	5	[illegible]
	[illegible]	1	[illegible]		[illegible]	1	[illegible]				[illegible]	3	[illegible]
[illegible]	[illegible]	1	[illegible]	1		1	[illegible]	1	[illegible]			4	[illegible]
[illegible]	[illegible]	1	[illegible]	1		1	[illegible]	1	[illegible]			4	[illegible]
	[illegible]	1	[illegible]			1	[illegible]					2	[illegible]
Total		17	[illegible]	5	[illegible]	19	[illegible]	7	[illegible]	1	[illegible]	49	[illegible]

Agro Processing Centre (APC) Programme: The APC Programme is implemented in the form of Special Purpose Vehicle (SPV) with participation of Government of India, State Government and Private Entrepreneurs. The Programme is implemented in the North Eastern States, Himachal Pradesh, Uttarakhand, Jammu & Kashmir, Andaman & Nicobar Islands and Lakshadweep.

Capacity Building Training Programmes (CBT): CBT aims to create awareness and skill development in the food processing industry. Under CBT, training programmes are conducted in the areas of food processing technologies, entrepreneurship development, quality control, food safety, packaging, hygiene and sanitation, etc. CBT activities are undertaken at various levels, viz. Short Term Training Programmes (STTP), Long Term Training Programmes (LTTP), Training of Trainers (ToT), Training of Entrepreneurs (ToE), Training of Farmers (ToF), Training of Food Handlers (ToFH), Training of Food Safety Officers (ToFSO), Training of Food Technologists (ToFT), Training of Food Analysts (ToFA), Training of Food Inspectors (ToFI), Training of Food Auditors (ToFA), Training of Food Safety Supervisors (ToFSS), Training of Food Safety Managers (ToFSM), Training of Food Safety Officers (ToFSO

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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		[illegible]				[illegible]	[illegible]
	[illegible]	[illegible]	[illegible]			[illegible]						[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		[illegible]				[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]				[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]				[illegible]	[illegible]

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[illegible]	[illegible]	[illegible]

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- [illegible]
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- [illegible]

[illegible]

farmer's field (in Mandal, Tumkur village in Tumkur district) with mulberry tree plantation (3 x 3 spacing) and

monitored and had six productive crop cycles were completed.

Leaf yield harvested from six consecutive years and quantities consisting recovery and collecting cocoons/crop with an average cocoon production of about 200 kg/acre/year were recorded in all locations/villages. Comparison to the farmer's the base income of 10 acre was received higher returns of Rs. 1,20,000/acre/year over Rupees 60,000 (Rs. 1,20,000/- and) and the cost benefit ratio was higher in polyhouse rearing shed (1:2.06) over Rupees 1,20,000 and 1:1.76) besides as production, the silk cocoon crop returns was used as further much increase significant improvement in soil fertility status (water, soil organic carbon content, available nutrients, microbial nitrogen and phosphorous enzyme activity as compared to control. Development of sericulture model (shed, leaf, silkworm) benefits in socio economic development of sericulture, no significant difference in soil parameters between farmer's field and polyhouse plants which was evident from cost equivalent ratio using t-test. (Not significant at 5% level). Cocoon yield, cost benefit ratio and soil parameters in mulberry without affecting yield.

Particulars	Values	Values	Level
pH	7.53	7.51	NS
Organic carbon content (%)	0.61	0.64	NS
Available N (kg/ha)	229	232	NS
Soil microbial biomass carbon (mg/kg soil)	0.01	0.02	NS
Soil dehydrogenase activity (µg TPF/g soil/24 hrs)	0.01	0.02	NS
Soil phosphomonoesterase activity (µg PNP/g soil/hr)	0.01	0.01	NS
Leaf moisture (%)	0.01	0.01	NS
Leaf biochemical contents (%)	0.01	0.01	NS
Leaf yield (kg/acre/year)	0.01	0.01	NS
Leaf quality (crude protein)	0.01	0.01	NS
Leaf quality (carbohydrate)	0.01	0.01	NS
Leaf quality (moisture)	0.01	0.01	NS
Cocoon yield (kg/100 dfls)	0.01	0.01	NS
Cocoon weight (g)	0.01	0.01	NS
Shell weight (g)	0.01	0.01	NS
Shell ratio (%)	0.01	0.01	NS
Cost benefit ratio	0.01	0.01	NS

[illegible]	[illegible]		[illegible]	
	[illegible]	[illegible]	[illegible]	[illegible]
A. [illegible] (Rs.)				
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]		[illegible]	
B. [illegible] (Rs.)				
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PM 1111: Determination of Yield Potential of Newly developed Biparental Hybrids under Two (Low Moisture Stress/Drought & Protective Irrigation) Environments

1. S. Yadav and S. Kumar

Objective:

- To determine the possibility of newly developed biparental hybrids under two moisture conditions and protective irrigation

Moisture stress (MS) were maintained by three treatments (S1, each cultivation (V) x cropping with Protective Irrigation (I1); Mild moisture conditions (S2) x cropping with Protective Irrigation (I1); Each cultivation (V) x Planting) without Protective Irrigation (I0); Control). Four best hybrids (PBH 8 x PBH1 (PBH8 x PBH1); PBH x PBH; PBH x PBH) along with two popular hybrids (P1) x P2; B (P3) x (P4)) were utilized for evaluation of their hybrid vigour, finding out best combinations. Three rows were considered (PBH) from one row at harvest. Five (5) Mehsen, Tamasa village, T Hanumgarh Dt.) was moisture conditions (P-2 x Cropping).

Significant improvement in commercial characters of best hybrids was observed in hybrids fed with newly Promising lines in water cropping young (DAP (T) followed by both parameters in water cropping with protective irrigation (T1). Significant differences (pCD05) were recorded between the characters and hybrids with respect to moving characteristics (panel weight, panel 1000 seed wt., single kernel wt., single panel wt. and yield) recorded among parameters (possibly average filament length, non-boron filament length, boron ratio (in percentage) and the yield reduction). No significant differences were recorded in color and size duration (PH) hybrid and duration and maturity were observed.

[illegible]											
[illegible]	[illegible]	[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
		[illegible]	[illegible]								
[illegible]	T1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	T2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	T3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	T1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	T2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	T3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	T1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	T2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	T3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	T1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	T2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	T3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	T1	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	T2	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
	T3	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Materials	Treatments	Seed quality		Seedling length (cm)	Shoot length (cm)	Root length (cm)	Vigour index (VI-I)	Vigour index (VI-II)	Germination (%)	Mean germination time (days)	Seedling dry weight (g)
		Germination (%)	Seed yield (kg/ha)								
DRR Dhan 48 (Cultivar check)	T1	79(63)	6.18	12.5	10.5	23.83	1885	1485	100	10.33	0.1
	T2	80(63)	6.18	11.8	10.2	22.0	1760	1636	100	10.33	0.1
	T3	81(64)	6.18	12.3	10.3	22.6	1829	1662	100	10.33	0.1
CD (P=0.05)	Treatments	2.05	0.79	0.51	0.31	0.14	3.85	61	0.00	0.00	0.0
	Varieties	2.05	0.79	0.51	0.31	0.14	3.85	61	0.00	0.00	0.0
	Treatments x Varieties	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS

Coordinating Scientist and Scientists

In the green manuring through Sesbania and other plantings, Sesbania green biomass was harvested and quantified (0.250 t/ha/plot). 1.13 kg biomass was incorporated into the soil (0.1 kg) to build soil organic matter. Three rhizobium cultures (PAU, TNAU & UAS) were maintained through periodical irrigation using AAT. In respect of post-harvest nutrients in soil, Dharwad rhizobium recorded higher SOC (0.65%) grain yield (kg/ha) and also significant over control plot (4.1 kg/ha).

Forecasting and Assessment of Weed in Paddy: survey for pest incidence was carried out in twenty five farmer's fields covering five villages. Across the pest incidence was noticed in twenty one fields. However, pest incidence was recorded (1.0-5.0 leaf/hill) in ten farmer fields. Average pest incidence recorded in eight farmer fields was one leaf/hill.

Off-season Rice Hybrids: Improved Combinations (IR58 x TR, IR58 x TR, IR 64 x TR) were developed along with popular checkers (PA x CRR). Hybrid rice seed was analysed. IR64 x TR performed better for days to 50% flowering, panicle length, seed fertility and grain yield.

Hybrids	Seed quality		Root length (cm)	Shoot length (cm)	Seedling length (cm)	Vigour index (VI-I)	Seedling dry weight (g)	Germination (%)	Mean germination time (days)
	Germination (%)	Seed yield (kg/ha)							
IR58 x TR	80(63)	1,250.00	12.50	10.30	22.80	1824.00	0.10	100.00	10.33
IR58 x TR	80(63)	1,250.00	11.80	10.20	22.00	1760.00	0.10	100.00	10.33
IR64 x TR	81(64)	1,250.00	12.30	10.30	22.60	1829.60	0.10	100.00	10.33
CD (P=0.05)	2.05	0.79	0.51	0.31	0.14	3.85	61	0.00	0.00
SE (m) ±	NS	NS	NS	NS	NS	NS	NS	NS	NS

Popularization of New Multiple Varieties: New multiple varieties especially MTU 1010, MTU 1061, MTU 1075 and Vasundhara 1 (Vijaya) were introduced and supplied to the farmers in non-traditional areas.

Coordinating Scientist and Scientists

Landscape Assessment Activities (Programmes): Kolo-Cropping pattern and its related soil and moisture in the area collection for the following collaborative projects with the main institute and other ICAR's.

Project Code(s)	Title	Centre
PROJECT	Survey and surveillance of major pests and their natural enemies in different rice ecosystem	NRRI, Cuttack (Odisha)
AICRIP	All India Coordinated monitoring of advanced experimental screening of rice in rice ecosystem	

Coordinating Scientist and Scientists

In the green manuring through Sesbania and other plantings, Sesbania green biomass was harvested and quantified (0.250 t/ha/plot). 1.13 kg biomass was incorporated into the soil (0.1 kg) to build soil organic matter. Three rhizobium cultures (PAU, TNAU & UAS) were maintained through periodical irrigation using AAT. In respect of post-harvest nutrients in soil, Dharwad rhizobium recorded higher SOC (0.65%) grain yield (kg/ha) and also significant over control plot (4.1 kg/ha).

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IR64 x TR	81(64)	1,250.00	12.30	10.30	22.60	1829.60	0.10	100.00	10.33
CD (P=0.05)	2.05	0.79	0.51	0.31	0.14	3.85	61	0.00	0.00
SE (m) ±	NS	NS	NS	NS	NS	NS	NS	NS	NS

Popularization of New Multiple Varieties: New multiple varieties especially MTU 1010, MTU 1061, MTU 1075 and Vasundhara 1 (Vijaya) were introduced and supplied to the farmers in non-traditional areas.

[illegible]	[illegible] variety	[illegible]
[illegible]	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]
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	[illegible]	[illegible]
	[illegible]	[illegible]
	[illegible]	[illegible]

Disaster Prevention Programme (DPP): Disaster prevention technologies were disseminated in one cluster under fully [illegible] with [illegible] and disaster tools. One week training with an average [illegible] of [illegible] 5 days, 20.7% acres of new plantations were established under [illegible] and conducted 2 [illegible] benefit of 45 farmers.

Institutional Village Linked Programme (IVLP): Twenty two acres of tree nursery plantation were established in one farmers' [illegible] with water quality monitoring [illegible] more than 80%. Five farmers were provided with short-term [illegible] associated under this programme. A quantity of vaccine were tested with five farmers with an average [illegible] of [illegible] per [illegible].

Farm Mechanization: 432 [illegible] were rented to generate 207 [illegible] income with an average yield of 30 kg/ [illegible]. 2640 [illegible] were rented and supplied to 181 farmers with an average yield of 81.11 kg/ [illegible] obtained.

Farm Maintenance: 1750 [illegible] farmers were motivated and produced 1400 kg [illegible] through the farm saving [illegible] farm assets and may help to produce [illegible] and utilized for [illegible].

Capacity Building Training Programmes (CBTP): 1000 [illegible] were conducted 4 farmers skill training programmes (4 [illegible]) and trained 100 farmers on various [illegible] technologies. 20 [illegible] were also trained under Technology Orientation Programme (TOP) 3 days.

Special Awareness Programmes: Various special awareness programmes including [illegible] campaigns, [illegible] campaigns [illegible] and [illegible] were conducted.

Production Commercialization Programmes: Various [illegible] were conducted by the [illegible] to develop and [illegible] technology developed by the [illegible] and Farmers.

[illegible]	Station	[illegible]											
		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]		[illegible]	
		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]		[illegible]	[illegible]					[illegible]	[illegible]			[illegible]	[illegible]
[illegible]		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Madurai - 625 104. Entomologist is a regular visiting place of agriculture farmers affected and across agricultural farmers, students and officials visited the unit for rendering knowledge transfer, on-line consultation, skill test and advisories and also on new technologies at different training and mastery institutions.

RRS - MADM

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Ongoing research Projects

PRS (MSE) - Soil Health Cards for agricultural farmers in states of Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Kerala, Maharashtra and Madhya Pradesh (Apr 2018 - Mar 2019)

i) Dr.M.Rajeswari and S.Rajkumar

Objective: To monitor the soil fertility status of mulberry gardens of Dharmapuri, Krishna Districts & Theni District to recommend balanced fertilizers & manures and create awareness

[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

2000 soil samples from 17 Tamil Nadu (2), Dharmapuri, Krishna (2) mulberry and other sericulture farmers were analysed for pH, EC, OC%, available P, K and S. The soil samples were also used to collect inputs for secondary and micro nutrient analysis and preparation of soil health cards (SHC) for individual farmers.

MSE MSE: Socio-economic impact of Tractor Mounted Implements on Mulberry Agriculture in Tamil Nadu (Mar. 2018 - Aug. 2019)

S. Rajkumar (PI), J. Balakumar, R. Sharma (Co-I), A.G.S. Dance, N.B. Sankaya, G. Ramakrishna and J. Murugan (Scientist)

Objectives:

- To analyze the impact of CSR on technology adoption and productivity improvement in sericulture in the study area of Tamil Nadu
- To elucidate the socio-economic impact of CSR on livelihood improvement of sericulturists in the study area
- To study the cost and returns from mulberry sericulture among different farm size holdings
- To elicit the constraints in dissemination of technologies faced by farmers and suggestions

basis of the literature survey and discussions with the experts, the questionnaire for data collection for studying the impact of CIFA technology adoption, productivity improvement, socio economic development of backyard fish and shrimp culture efficiency in north India was finalized. Data collection from 10 farmers each of big, medium and small sizes was initiated.

PRP 19(P) Assessing the efficacy of recommended chemicals for insect/disease/weed management and their impact on soil biota of multipurpose screens in South India (Apr. 2013 – Mar. 2015)

I. Ravichandran (PI), T. Rajeshwari, M. Sabina Dharmaraj, M.S. Thanikkal Beeta and R. Ebenezer

Objectives:

- To assess the efficacy of formulation mulberry chemicals for the management of insect pests/ diseases/ weeds;
- To assess the impact of spraying the efficacy of chemical utilized for mulberry insect pests/ diseases/ weed management;
- To study the effect of pesticides on soil biota
- To analyze the residual toxicity of pesticides in mulberry ecosystem.

Using on station germplasm, natural enemies and soil biota (micro flora, insect flora and micro flora) at Rajahmundry before and after spraying treatments were collected as per the plans. Pre-treatment data on soil biota was collected after spraying and 1DAT, 3DAT, 5DAT, 7DAT, 10DAT, 15DAT and 30DAT.

Collaborative research Projects/Programmes: Work is also to be undertaken in the state collection for the following collaborative projects with the host institutions and other ICAR.

Project Code	Title	Partner
[illegible]	A study on the impact of Pest and Disease management practices in cumulative spraying for Sweet Lime under Citrus Orchard Programme in south India	[illegible] ICAR Research Fund
[illegible]	Study on the pest management in [illegible]	ICAR Research Fund
[illegible]	Survey and surveillance of [illegible]	[illegible]
[illegible]	Popularization of Nonedible oil Biomass Briquettes for management of [illegible]	[illegible] [illegible] [illegible] [illegible]
[illegible]	[illegible]	[illegible]
[illegible]	Soil health cards for sample farmers' fields of Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Kerala, Puducherry and Andhra Pradesh	[illegible]
[illegible]	[illegible]	ICAR-Indian Institute of Soil Science, Bhopal
[illegible]	"Farmland multi-nutrient Soil Fertility Management (FMSFM) Practices" [illegible]	[illegible]
[illegible]	[illegible]	[illegible]

Livelihood Improvement Programmes (LIP): Livelihood improvement technologies were disseminated in 10 villages of the north India and Kerala and a total of 10 awareness/ training programmes were conducted. Knowledge gained (Pre-training) [illegible] and (Post-training) [illegible] respectively.

Institute Village Linked Programme (IVLP): Two months rapport-building was started with 200 farmers in five villages (Kathirampatti & Thondamuthur) and Palakkad on average class of [illegible] with an improvement of [illegible] annual gross income per farmer.

उन्नत प्रजनन तकनीक

Performance of Improved Crossbreeds: Five improved crossbreds (MYSORE, LARGE WHITE × MYSORE, DUROC, LARGE WHITE × DUROC, LARGE WHITE × DUROC × MYSORE) were reared along with pedigree crossbreds (PIC) under field conditions and data was analysed.

Performance of Improved Crossbreeds (Mean of Traits)									
Traits	Litter size at birth (No.)	Litter size at birth (kg)	Litter size at weaning (No.)	Litter size at weaning (kg)	Litter size at 6 months (No.)	Litter size at 6 months (kg)	Age at first farrow (days)	Age at first farrow (kg)	Age at first farrow (No.)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Performance of Pure Breeding Pigs: Line X of Yorkshire (LWY), Line Y of Yorkshire (LWY), Line Z of Landrace (Landrace type) (LWY), Line A of Duroc (DUROC), Line B of Duroc (DUROC), Line C of Duroc (DUROC) were maintained at Pig Farm - Dec. 2016. Performance of three sire lines viz. Landrace (Landrace type) (LWY), Duroc (DUROC) and Yorkshire (LWY) were recorded during June - July 2016.

Performance of Pure Breeding Pigs at Pig Farm, ICAR-CPRI, Mukteshwar											
Breeding	Sire	Litter size at birth (No.)	Litter size at birth (kg)	Litter size at weaning (No.)	Litter size at weaning (kg)	Litter size at 6 months (No.)	Litter size at 6 months (kg)	Age at first farrow (days)	Age at first farrow (kg)	Age at first farrow (No.)	Age at first farrow (kg)
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Performance of Pigeons Designed Breeding Crossbreeds Indigenous											
Breeding	Sire	Litter size at birth (No.)	Litter size at birth (kg)	Litter size at weaning (No.)	Litter size at weaning (kg)	Litter size at 6 months (No.)	Litter size at 6 months (kg)	Age at first farrow (days)	Age at first farrow (kg)	Age at first farrow (No.)	Age at first farrow (kg)
[illegible] [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible] [illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Continuous Other Activities

Preservation of Rare Genomic Material and Husbandry Techniques: Highly successful cryogenic system (at cryogenic level of -196 °C) was established with liquid N2 with rare features and the freezing parameters was set

Incidence as a part of population control, which is not modern, sensitive [illegible] and [illegible] aspiring pathogens were supplied to the farmers.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Production of Biological Control Agents: Biological control agents such as 2.00 lakh Agrobacterium radiobacter (ARS) units, 1.500 Trichoderma, 0.75 lakh Pseudomonas fluorescens (PF) formulations and 25 units of Bacillus thuringiensis (Bt) formulations were produced through the ARS units in the academy campus. Mass production of pheromone traps for pest monitoring. The biocontrol agents ensured infestation of pests mostly bugs, thrips and borers mostly bugs to 30%, 25% and 10.2% respectively.

Establishment of AMU: Affordable micro irrigation technology (drum drip technology) and drip irrigation system was released at ICC Campus for the mitigation drought situation.

Capacity Building Training Programmes (CBT): KVKs and 12 related units conducted 24 Farmers, ARS Training programmes for [illegible] and trained [illegible] farmers on various agriculture technologies. Out of this, [illegible] students were also trained under [illegible] Technology Dissemination Programme (TDP, 3 days) at KVKs based and [illegible] ARS.

Special Awareness Programmes: Various special awareness programmes including digital transactions, SPI etc., in the DRP clusters [illegible] programmes) and [illegible] [illegible] farmers/stakeholders.

Information Resource Centers: Electronic and Information Resource Centers were open at Thalaiyanam, Mangalam, DRP Attangarai, NBC & Training and Demonstrations, DRP Kaveripatti, NBC are proposed in the remaining all [illegible] regions.

Extension Communication Programmes: Various [illegible] were conducted by the ARS and its related units for the transfer of technology developed in the field, institute and farmers level.

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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Ph.D. Students: At present 3 students are pursuing Ph.D. under Ranga University Delhi and one student pursuing Ph.D. under Maharashtra Animal and Fishery University Nagpur. During the year one student has completed seminar requirement for Ph.D.

M.Sc. Students: Five students of M.Sc. Seed Science and Technology Course have completed their M.Sc. (Microbiology) dissertation work.

Refresher Training: It is regular training programme for the Scientists, Teachers and Officers for updating knowledge on new technologies of disease testing and recovery in fisheries.

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(Ongoing research Projects)

PRJ-0000: Soil Health Scan for sustainable farmers in states of Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Kerala, Maharashtra and Madhya Pradesh (April 2018 - May 2021)

3. Higher Research Or Developmental Proj

Objective: To monitor the soil fertility status of nutrient in garden of Karnataka, Andhra Pradesh & Tamil Nadu to recommend balanced fertilizers & nutrients as a remedy measure

2020 soil samples collected from farmers and analysed for pH, EC and OC. The soil samples were also sent to Soil Analysis for micro-nutrient analysis and preparation of soil health cards (SHC) for individual farmers.

WSF 5567: Studies on yield gap in different cocoa production in the states of Andhra Pradesh and Telangana (Jan 2018 - Jan 2019)

M.A. Shankar India (PI), M.R. Prabhu, T.H.A. Rao, R.K. Reddy & Ashwin, Sr. assistants/Agric Asst & Assistants

Objectives:

- To quantify the yield gap in Nutsedge and different cocoa production in Andhra Pradesh and Telangana states;
- To analyse the reasons for the yield gap in Nutsedge and cocoa production

Based on the literature survey and discussions with the experts, the questionnaire for data collection for studying the impact of CPP on technology adoption, productivity improvement, socio-economic development of agriculturists and technological efficiency in Andhra Pradesh and Telangana was finalized. Data collection from 20 farmers each of big, medium and small scale was initiated.

Collaborative research Projects/Programmes: ICAR-IISR and its regional units are involved in the data collection for monitoring soil fertility projects with the main institutes and other NGOs.

Project code	Title	Status
PRJ-0000	A study on the impact of soil and nutrient management practices in cocoa farming for farmers' welfare (Land Investment Programme in South India	PRJ-Ongoing PRJ-Completed PRJ-New
PRJ-0000	Study on [illegible]	PRJ-Completed
PRJ-0000	A study on the effect of [illegible]	PRJ-Ongoing
PRJ-0000	Assessment of [illegible]	PRJ-Completed
WP-0000	Validation of [illegible]	PRJ-Completed
PRJ-0000	Soil health scan for [illegible]	PRJ-Completed
WP-0000	Nutrient [illegible]	PRJ-Completed
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]

Coastal Plantation Programme (CPP): Six promising sub-clones of Sujata were tested in 12 locations across Andhra Pradesh and Karnataka. In Telangana area, a total of 32.21 lakh seedlings of hybrid cashew were planted with an achievement of 104.16% against the target of 30.93 lakh seedlings. The new plantation achievement was 64.40 lakh against the target of 73.62 lakh.

Adoption Village Linked Programme (AVLP): Sujata is also the variety that was tested with 400 farmers in 100 villages (Prakasham, Guntur, Nellore, Chittoor, Kadapa and Anantapur districts of Andhra Pradesh and Karnataka) during 2016-17. Sujata recorded an average yield of 1.5 kg/tree (6.0 kg/sq.m) as against the average yield of 0.8 kg/tree (3.2 kg/sq.m) recorded by other varieties.

Multi-location Trials

Performance of Promising Hybrids: Three hybrids (H 1608 × H 1) H 1608 × H 1 [2] were tested along with popular checks (H 1 and H 1608) in the All India trial.

Performance of Promising Hybrids (Mean of 3 Yrs)									
Hybrids	Yield (kg/tree/year)		Yield (kg/ha)	Nuts (no/kg)	Kernel Recovery (%)	Oil (%)	Tannin (mg/100g)	Total Sugars (%)	Kernel Colour
	No.	Rank							
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Evaluation of Clones (Cl): Seven promising clones (Cl 1, Cl 2, Cl 3, Cl 4, Cl 5, Cl 6, Cl 7) were maintained during Kharif - Rabi - 2016-17.

Performance of Promising Clones (Mean of 3 Yrs)						
Clones	No.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

One crossing block of nine hybrid seedlings (H 1607 × H 1608) and (H 1607 × H 1608) and (H × H 1608) was completed during Dec 2016 – May 2017.

Hybrid	No.	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

Continuous/Other Activities

Popularization of new silkworm hybrids and mulberry varieties: [illegible]

[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

Production of Biological Control Agents: [illegible]

Capacity Building Training Programmes (CBP): [illegible]

Special Awareness Programmes: [illegible]

Extension Communication Programmes: [illegible]

Radio/TV Programmes: [illegible]

Visitors: [illegible]

[illegible] Communication Programme

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]			[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
[illegible]	[illegible]				
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

ADMINISTRATIVE REPORT

[illegible]

[illegible] Agricultural Research & Training Institute, Mysuru

[illegible] Agricultural Research Stations (ARS)

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
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	[illegible]		[illegible]	
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[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	
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[illegible] and Administrative Personnel of [illegible] and Related Units - [illegible] Recruitment

[illegible]

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Bihar

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Andhra Pradesh

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Telangana

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Maharashtra

[illegible]

Technical Personnel

[illegible]

Administrative Personnel

[illegible]

Budget (Rs. in Lakh) for 2016-17

Particulars	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]
Total	[illegible]	[illegible]

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Ministry of Textiles, Govt. of India
Main Railway Station

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Month	Temperature (°C)			Relative Humidity (%)			Rainfall (mm)
	Max	Min	Avg	Max	Min	Avg	
January	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
February	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
March	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
April	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
May	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
June	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
July	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
August	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
September	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
October	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
November	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
December	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Mean	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	
Mean High	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]
Mean Low	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]
						Total Rainfall	[illegible]
						No. of Rainy Days	[illegible]

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#	Research Parameter	Unit	Target	Achievement
1	[illegible]	No.	[illegible]	[illegible]
2	[illegible]	No.	[illegible]	[illegible]
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