

PROCEEDINGS OF INSTITUTE RESEARCH COMMITTEE MEETING-2018

Inaugural Session and Tobacco Scientist- Farmer- Board- Trade Interface

Date: 17.08.2018

Chairman: Dr. D. Damodar Reddy

Rapporteur: Dr. B. Hema

Institute Research Committee (IRC) meeting was held from 17-19 August, 2018 under the Chairmanship of Dr. D. Damodar Reddy, Director, ICAR-CTRI. Dr. Y. Subbaiah (Principal Scientist) welcomed the Chief Guest, Dr. K. Deo Singh (Former Director, ICAR-CTRI); Guest of Honour, Dr. K.V.Ramana, Former ADG (Horticulture and Plantation crops), ICAR; Chairman of IRC, Director, ICAR-CTRI and members of IRC. Dr. C. Chandra Sekhara Rao (Member Secretary, IRC) welcomed the delegates, experts, Tobacco Board officials, Trade members and farmers and emphasized the importance of IRC meeting and its active role in reviewing the progress of ongoing research programmes and approval of the new project proposals.

In his opening remarks, Dr. D. Damodar Reddy welcomed all the delegates and placed on record his gratitude to the Secretary, DARE & Director General, ICAR for his support to Tobacco research. The Chairman presented the thrust areas, and research highlights during 2017-18 encompassing new variety release proposals of TBST-2, elucidation mechanism of TSNA accumulation in burley tobacco, management of *orobanche*, dense planting technique in dry land areas, soil fertility maps, solar energy for curing, new generation insecticide, and tobacco seed oil for human consumption. He has also mentioned about impact of the institute on overall growth of tobacco in terms of productivity, profitability and prosperity of tobacco farmers and appreciated the scientists for their significant research contributions, publications and awards. He emphasized upon RAC recommendations of the institute on pre-breeding and marker assisted selection for evolving superior varieties; development of integrated crop management modules; soil fertility maps and STCR based fertilizer prescriptions; non-chemical approaches of pest and disease management; solar energy use for FCV tobacco curing; tobacco aided molecular farming and filling up of scientific cadre strength which are to be taken into consideration for formulation of new projects. He has highlighted the achievements in pulses seed hub of the institute and mentioned the infrastructure created for seed hub. He made a note on implementation of different government initiatives and flagship programmes viz., LED based lighting and energy efficiency equipment; installation of solar roof top PV panels; soil health card scheme; Swacchh Bharat Abhiyan and Sankalp Se Siddhi.

Dr. K. V. Ramana expressed satisfaction with the present ongoing research programmes of the institute. He stressed the non-chemical approaches in tackling pests and diseases and *orobanche* management. He suggested that utmost care need to be taken while recommending chemical approaches for pest and disease management.

Dr. K. Deo Singh, Chief Guest, in his remarks appreciated the significant contributions made by tobacco scientists over the years. He expressed that there is a need for addressing the location specific problems and all the significant research achievements need to be disseminated to farmers for achieving the desired goals. He complemented the efforts on inclusion of pulses in tobacco based cropping systems. He advised to concentrate on efficient utilization of solar energy, integrated farming system approach, conservation, storage and efficient utilization of rain water. He urged scientists to give special attention for future thrust areas of research by looking the national priorities on tobacco.

Tobacco Scientist- Farmer-Board-Trade Interface was organized on 17-08-2018 to elicit the information on constraints in tobacco production and exports. At the outset, Dr. Y. Subbaiah, welcomed scientists of ICAR-CTRI, officials from Tobacco Board, Trade and farmer representatives from different regions and informed the purpose of the interface meeting. Dr. D. Damodar Reddy, Director, ICAR-CTRI, the Session Moderator briefed the delegates about the background of conducting the interface.

Mr. Reddayya, farmer from Northern Light Soils (NLS) region of Andhra Pradesh expressed the concern over increasing cost of cultivation and felt the need for efforts to reduce the cost of tobacco cultivation. According to him, weeds and *orobanche* are the major problems in tobacco. He narrated his own fuel wood saving measures in his barn and requested the scientists to make a visit to his farm and work out economics.

Mr. Konda Reddy, farmer from Southern Light Soils (SLS) region of Andhra Pradesh expressed distress over the unavailability of water for agriculture purpose in Prakasam district of Andhra Pradesh. He mentioned that in the available drought conditions, tobacco is the only option for the farmers as there are severe price fluctuations in other crops. He informed that 90 per cent of the tobacco farmers in Prakasam district are cultivating FCV tobacco variety Siri, but it is not showing tolerance to drought, therefore he urged the need for development of new varieties of tobacco suitable to the drought regions.

Mr. Srinivas, Chief Scientist, ITC Ltd-ILTD Division, mentioned different aspects on quality improvement, mechanization, fuel wood saving measures and yield enhancement in tobacco. He viewed that high yielding varieties of tobacco need to be identified at the earliest and emphasized the need to develop package of practices to mitigate climate change and make it available at farmer's level. He has also expressed concern on increasing chloride levels and pesticide residues in tobacco leaf. In reply, it was informed that steps were initiated for mechanization in tobacco, in collaboration with CIAE, Bhopal and the scientist visited Karnataka Light Soils (KLS) region for assessing the feasibility of mechanization in harvesting and transplanting.

Dr. Damodar Reddy enquired about the reasons for increasing chloride content in tobacco leaf as ground water is not saline in KLS region. To this query, Dr. S. Ramakrishnan, Head i/c, ICAR-CTRI Regional Station, Hunsur, explained that last year

there is severe drought in Karnataka, because of which chloride concentration in leaf might have increased.

Dr. Prabhakar, GPI, explained about the importance of Vinukonda burley, which is produced to the tune of 20 million kg. He mentioned that demand for Indian burley is more in the world market as Thailand Burley is contaminated with heavy metals. He further stated that Vinukonda burley farmers are making 30 per cent profit than other farmers due to high demand. But he expressed concern and urged scientific fraternity to assess the fertility status of the soils, and to develop water conservation techniques and specific package of practices for Vinukonda burley.

Mr. Patil, GPI, expressed his views on excess usage of fertilizers in Vinukonda burley tobacco and hence there is a need for proper fertilizer recommendation system.

Mr. Punith, GPI, pointed out that Vinukonda region is a rain shadow area with very less rainfall, he expressed that drought resilient technologies to be developed for burley tobacco.

Mr. Prem, GPI, further added that developing package of practices of burley tobacco under irrigated and rainfed conditions separately will be helpful for Vinukonda region.

Mr. Guruvayya, Alliance, expressed that in view of ban on certain plant protection chemicals, there is a need to evaluate alternatives in place of them. He also expressed that an alternative to Pendimethalin as suckericide need to be developed in view of the very low GRLs.

Mrs. Krishnasree, Auction Superintendent, Tobacco Board, expressed concern about the low grades in tobacco, pesticide residues in tobacco leaf and failure of green manure seed germination in drought conditions. She stressed the need on developing online weather based recommendation system which will help in adapting suitable measures for managing different field problems.

Mr. Maruthi Prasad, Manager (Extension), Tobacco Board, expressed that there is a need for drought resistant variety for drought prone FCV tobacco growing areas of Andhra Pradesh. There should be handful of tobacco varieties made available to the farmers to make a choice out of it. He expressed concern over cultivation of non-approved tobacco varieties and possible steps are to be initiated to stop them. He further added that there is a need for weather based crop advisory system, control measures for viral diseases and document on Good Agricultural Practices in NLS, SLS, SBS and KLS regions. At the end, he stressed that farmers need to be re-educated in curing practices.

The Inaugural Session was ended with the concluding remarks by the Chairman and he appreciated all the participants for sharing their vast experiences in tobacco. At the end, Dr. Y. Subbaiah proposed vote of thanks to the chairman and all members.

Presented by	Project Title & Code	Research highlights	IRC recommendation
CROP IMPROVEMENT			
ICAR-CTRI, Rajahmundry			
Dr. K. Sarala	Br-2: Evolving superior varieties of FCV tobacco through hybridization	<ul style="list-style-type: none"> • FCR-4 (2658 kg/ha) and FCR-17 (2520 kg/ha) are found superior in bulk trial. • Five entries were contributed to AINPT trials. • Advanced breeding lines, V-5125,V-5119, V-5133 and V-5132 found superior with higher cured leaf yields in replicated yield trials. • Inter-specific cross derivatives, viz., ABL 86, ABL 88, ABL 92 and ABL 96 recorded significantly higher (14-17 %) cured leaf yield (2952-2874 kg/ha) over control, Siri. 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I and also suggested to study • TMV resistant varieties need to be released using the TMV resistance source
Dr. K. Sarala	Biotech-6 : Molecular Mapping of Important Tobacco traits	<ul style="list-style-type: none"> • Three immortal mapping populations (RILs) viz., HDBRG x BY 53, Candel x Nisnicotinony 121 and A 145 x Jayalakshmi (WS) developed for important tobacco traits viz., solanesol, nicotine and seed oil were maintained. • Mean nicotine content estimated in the air cured leaf samples of nicotine molecular mapping population ranged from 0.65 to 2.96% and the mean solanesol content in the RILs found to be between 0.91% and 2.88%. • trnH-psbA region found to have more number of nucleotide substitutions and variations in the segment insertions compared to Ycf1 gene among 24 <i>Nicotiana</i> species accessions 	<ul style="list-style-type: none"> • Approved to extend the project with the following work plan during 2018-19. <p>Linkage analysis of SSR markers with nicotine and solanesol traits</p> <p>Phenotyping of mapping population for morphological traits for mapping and identification of elite lines</p>
Dr. K. Prabhakara Rao	Biotech-11: Biogenesis and regulation of TSNA (Tobacco Specific	<ul style="list-style-type: none"> • The expression of CYP82E4 gene is more prominent in top leaves compared to bottom leaves, and high converters lines have 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in

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	Nitrosamines) in tobacco	<p>relatively higher expression of CYP82E4 compared to low converters indicating higher expression of Demethylase gene facilitating the conversion of nicotine to nornicotine.</p> <ul style="list-style-type: none"> • Among the different burley genotypes, Banket-A1, YB-19 and YB-22 (High converters) reordered relatively higher nicotine and nitrogen content compared to TN-90 and VA-510 (Low converters) irrespective of the curing. 	<p>RPF I and also suggested to study</p> <ul style="list-style-type: none"> • Standard Procedure may be for the identification of low TSNA convertor (LC) genotypes from Banket-A1 seed plots for producing LC seed.
Dr. A.V.S.R. Swamy	B- 50: Breeding non FCV tobacco types for desirable traits	<ul style="list-style-type: none"> • In bulk trail, YB-19 (2390 kg/ha) and YB-22 (2195 kg/ha) proved superior among all the four entries tested, in terms of morphological and yield characters. • The Selection F6-2-2 recorded the highest seed yield of 750 kg/ha under bulk evaluation. 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I. • YB 19 and YB 22 can be given for manufacture test. • The selection F6-2-2 may be evaluated at Katheru farm for seed yield.
CTRI RS, Jeelugumilli			
Dr. A.V.S.R. Swamy	JL.Br.2.1: Evolving flue-cured tobacco variety having high yield and better quality suitable for NLS area of Andhra Pradesh	<ul style="list-style-type: none"> • Lines, RT 11-1(2818 kg/ha) and RT-16-3 (2677 kg/ha) were found superior in replicated yield trials. • FCJ-11 (3127 kg/ha) and FCJ-15 (2869 kg/ha) were better performing entries in bulk trials. 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I. • The House suggested to evaluate FCJ-11 in farmers fields.

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CTRI RS, Kandukur			
P.V. Venugopala Rao	K Br- 6: Breeding FCV tobacco varieties for yield and quality characters under SLS condition	<ul style="list-style-type: none"> • Three light cast lines viz., KB-90, KB-67 and KB-51 were significantly superior over Siri with 9 to 15 percent increase in cured leaf during 2017-18. • Four medium cast lines viz., KB-50, KB-32, KB-60 and KB-52 were significantly superior with 16 to 29 per cent improvement in cured leaf over Siri. • Thirty one aphid tolerant and 18 caterpillar resistant F4 plant progenies were evaluated and selections made for further evaluation. 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I. • Both caterpillar and aphid resistant lines are to be evaluated in one replicated trial. • Drought tolerant entries are to be assessed in farmer's field.
CTRI RS, Hunsur			
Dr. C. Nanda	BR 19: Breeding for developing high yielding and/or disease resistance varieties/hybrids and evaluation of advanced breeding lines of FCV tobacco suitable to Karnataka Light Soil Regions	<ul style="list-style-type: none"> • Out of seven entries tested in replicated trial, FCH 248 found to be superior in yield parameters over checks • Eight new hybrids were synthesized using CMS lines under hybrid development programme • F1's produced to incorporate TMV resistance into Kanchan back ground were screened for TMV resistance and resistant plants were back crossed with Kanchan to recover genome of interest. 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I. • Emphasis need to be given to generate more hybrids using the available CMS lines.
CROP PRODUCTION			
Dr. S. Kasturi Krishna	A.83 : Integrated Management of <i>Orobanche</i> in FCV tobacco	<ul style="list-style-type: none"> • In bulk trails only 2% <i>orobanche</i> infestation was observed in FCV tobacco grown succeeding sesamum with neem cake application at 30 DAP @10g per plant in alfisols. • No <i>Orobanche</i> infestation was observed in FCV tobacco grown with polythene mulch under Vertisols. Though 14 % infestation of 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 to develop Integrated Management Practices for <i>Orobanche</i> as per the suggestion of RAC • Suggested to explore the possibility of using biodegradable mulch to control

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		<p><i>orobanche</i> was observed under plastic much, it recorded higher yields because of high moisture conservation in the soil.</p> <ul style="list-style-type: none"> • Soil solarisation with polysheet reduced the infestation of <i>Orobanche</i> in alfisols. 	<p><i>orobanche</i> and also to study the role of fenugreek in controlling <i>Orobanche</i> in tobacco.</p>
Dr. S.V. Krishna Reddy	A.84:Studies on False Maturity and its mitigation strategies in FCV tobacco growing zones of Andhra Pradesh. A. Vertisol conditions and B. Irrigated Alfisols	<p>A. Vertisols</p> <ul style="list-style-type: none"> • Under Vertisol conditions, application of organic manure (FYM) + balanced NPK plot performed better without false maturity • Regular inter-culture with complete weeding and <i>Orobanche</i> removal performed better without false maturity <p>B. Irrigated Alfisols</p> <ul style="list-style-type: none"> • Application of FYM + balanced NPK (reco.) and FYM + (excess N) rec.PK plots topping/ sucker control plots, decanal (2%) + pendimethalin (0.3%),excess irrigation during grand growth period, irrigation as per schedule, regular inter-culture performed better and recorded higher GLY, CLY, GI, GL/CL and GI/CL(%)without false maturity symptoms 	<ul style="list-style-type: none"> • This experiment is concluded. RPF III is to be submitted.
Dr. T. Kiran Kumar	A.86:Crop intensification and diversification for higher system productivity and profitability of tobacco growing vertisols	<ul style="list-style-type: none"> • Among the different cropping systems studied maize-tobacco system recorded higher system productivity followed by sorghum-tobacco and fallow-tobacco and • Maize-tobacco cropping system recorded highest net returns (₹ 84653/ha) followed by fallow tobacco (₹74565) and sorghum-tobacco (₹71799 /ha). 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I and suggested 'to analyse the soil samples at the end of the cropping season in response to different treatments'.

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Dr. Y. Subbaiah	Ag. Extension 50:Technology Evaluation, Demonstration and Impact Analysis.	<ul style="list-style-type: none"> • Evaluated Advanced Breeding Lines in real farm situation of NLS area. Farmers preferred FCJ-11 and Tobios-6 over cv: Kanchan due to its high yielding potential and returns. • Technology adoption has contributed to significant improvement in farm productivity and profitability in KLS area 	<ul style="list-style-type: none"> • House suggested not to include the proposed study on identification and characterization of IFS in the existing project and approved to continue the project during 2018-19 to fulfill the object of Technology adoption and constraint analysis in SLS and SBS areas of AP.
Dr. H. Ravisankar	ARIS-15:Tobacco Agridaksh: An online expert system	<ul style="list-style-type: none"> • Software development for ontology based retrieval of information on Nutrient deficiencies has been completed and linked to home page of Agridaksh for global accessing. • Development of software on information system for tobacco in India has been completed. • Tobacco Agridaksh' a web based expert system on tobacco with various modules has been developed and linked to home page of 'Agridaksh' website hosted in IASRI data centre which provides global accessing of the information on tobacco. 	<ul style="list-style-type: none"> • The project was concluded. RPF III will be submitted.
K. Viswanath Reddy Dr. B.Hema Dr. A.Srinivas	Ag. Econ. 1: Critical Evaluation of Tobacco sector and its socio-economic impacts	<ul style="list-style-type: none"> • On global tobacco landscape, there is a geographical shift in tobacco production base from developed countries to developing countries • Tobacco yield is showing an increasing trend in Asia while in America it is showing decreasing trend during the last fifteen years • The crop size fixation policy has made significant impact on adoption of alternative crops and this approach is one of the potential instruments to foster transition 	<p>Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I.</p> <p>House suggested to analyse overall socio-economic impact of tobacco apart from studies on FCV and non-FCV tobacco growing regions separately.</p>

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		<p>from tobacco to other sustainable alternative crops</p> <ul style="list-style-type: none"> • FCV and Non-FCV (<i>bidi</i> and <i>motihari</i>) tobacco farmers are socio-economically well empowered than non-tobacco farmers in terms of income, assets and social status • The common factors for cultivating FCV and non-FCV tobacco are profitability, location suitability and timely finance 	
CTRI RS, HUNSUR			
Dr. M. Mahadevaswamy	A. 41. Studies on climate risk management in FCV tobacco based cropping systems in STZ of Karnataka.	<ul style="list-style-type: none"> • The number of rainy days showed negative correlation with the productivity of the crop, leaf chlorides, and positive effect on reducing sugars • Drought management practices involving supply of starter dose of N through application of Calcium nitrate increased the cured leaf productivity up to 11% and top grade equivalent by 7.6-10.0% compared to control. • Paddy straw mulching as well as foliar nutrition of N and K at 45 and 60 DAT through PN at 1% were also proved effective in maximizing the cured leaf productivity and bright grade production in dry belt/regions of KLS. • The cured leaf productivity could be enhanced by 10% by adopting a spacing of 90 x 50 cm and increasing the population to 22,222plants/ha compared to 100 x 55 cm (18,181 plants/ha) 	Suggested to draw treatment conclusions under Normal rainfall, excess rainfall and deficit rainfall and suggested to develop site specific technologies for different climate and weather situations in FCV growing region of Karnataka. Suitable optimum plant population should be suggested for different zones viz., dry, wet and normal etc. Approved to continue the project for one more year
Dr. M. Mahadevaswamy	A.42:Evaluating the alternate	<ul style="list-style-type: none"> • Fertilizer combinations involving 20:20:0+Ammonium 	Approved to continue the project for the year 2018-19 as

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	nutrient sources to provide balanced nutrition for flue-cured tobacco grown in KLS region	sulphate+SOP,20:20:0+Urea+SOP, performed better both in terms of cured leaf yield & bright grade production in dry/semi wet zones, while AS+SSP+PN combination proved comparatively better in the wet zones of KLS.	per the approved work plan in RPF I.
CTRI RS,VEDASANDUR			
Dr. M. Kumaresan	A. 103:Evaluation of Integrated agro-techniques for increased productivity and farm returns	<ul style="list-style-type: none"> The experiments were started in May, 2018. Results will be given in Next IRC meeting. 	<ul style="list-style-type: none"> This project will be continued during 2018-19.
CTRI RS, DINHATA			
Dr. A. Srinivas	A-10:Permanent manurial trial on <i>Motihari</i> tobacco	<ul style="list-style-type: none"> Balanced fertilizer regime consisting N, P and K (112 kg N + 112 kg P₂O₅ + 112 kg K₂O ha⁻¹)maintained significantly higher productivity of <i>Motihari</i> tobacco in terms of green leaf yield, cured leaf yield and first grade leaf yield as compared to imbalanced fertilizer use. The fertilizer regimes with one or two nutrient omissions continued to result in yield losses and hence represented unsustainable practices. Of all the nutrients, N proved to be “a-must-add” nutrient for obtaining optimum <i>Motihari</i> tobacco yield. 	<ul style="list-style-type: none"> It is a permanent manurial trial and the project will be continued during 2018-19.
CROP PROTECTION			
ICAR-CTRI, Rajahmundry			

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U. Sreedhar	E-81: Bio-efficacy and field evaluation of new pesticides against tobacco pests A.Evaluation of botanicals against <i>spodoptera litura</i> Fabricius in tobacco nurseries	<ul style="list-style-type: none"> Emamectin benzoate 0.0025% recorded least damage to the seedlings followed by NSKS 2% and Neemazal 1% @ 30 ppm. 	<ul style="list-style-type: none"> In view of the suggestions of RAC, the house approved to rename the project as “Integrated management of tobacco pests” by including the objectives viz. non chemical approaches for the management of insect pests and diseases, development, evaluation and refinement of IPM modules for production of pesticide residue free tobacco and extend the project for three years.
	B.Validation of integrated management module for sucking pests in FCV tobacco	<ul style="list-style-type: none"> Whitefly population and the LCV disease incidence were least in chemical control plot (0.39 -0.65/plant), followed by IPM plot (0.43-.99/plant). The predator population was more in IPM plot as compared to the chemical control plot. 	
	B. Field efficacy of new insecticides against tobacco aphid, <i>Myzus nicotianae</i> Blackman in FCV tobacco	<ul style="list-style-type: none"> New insecticides, sulfaxaflor 21.8 SC @0.007% and flupyradifurone 18.09 SL @ 0.026% were found to be highly effective against tobacco aphid, <i>M.nicotianae</i>. 	
	D.Refinement and evaluation of modules against insect pests of tobacco	<ul style="list-style-type: none"> Application of insecticides @ 10, 25, 40 and 55 DAP with thiamethoxam 25 WG @ 0.005%, pymetrozine 50 WG @ 0.02%, flonicamid 50 WG @ 0.02%, and imidacloprid 200 SL @ 0.005% recorded least sucking pest population and incidence of viral diseases 	
G.Raghupathi Rao	E.Monitoring and management of insecticide resistance in tobacco caterpillar, <i>Spodoptera litura</i> Fabricius	<ul style="list-style-type: none"> Among the test insecticides, order of relative toxicity based on LC 50 value when compared to chlorpyrifos to all the strains were as follows. Emamectin benzoate > chlorantraniliprole > chlorfenapyr > flubendiamide >spinosad> 	

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		<p>cyantraniliprole. Based on LC 50 value, emamectin benzoate was the most toxic insecticide followed by chlorantraniliprole. chlorfenapyr and flubendiamide were less toxic than emamectin benzoate.</p> <ul style="list-style-type: none"> Proposed work plan - Generation of base line toxicity data for various insecticides against <i>S.litura</i> collected from Guntur, Kandukur and Rajahmundry, ii- incidence of insect transmitted viral diseases in Guntur and Kandukur areas. iii-Studies on “Insect pest succession, dynamics and management in Vinukonda burley tobacco”. No significant differences in spray characters viz. droplet density and spray coverage were observed with and without addition of surfactant.(Wetcit) 	<p>Vinukonda burley tobacco” at Vinukonda during 2018-19.</p>
S.K.Dam	<p>F.Evaluation of <i>Trichoderma viride</i> formulations for the management of soil borne fungal diseases in FCV tobacco nursery</p>	<ul style="list-style-type: none"> Soil application of <i>T. viride</i> (2×10^7 CFU g) with neem cake @ 30 g/m² can be effective in suppressing soil borne fungal diseases caused by <i>P.aphanidermatum</i> and <i>P. parasitica f. sp. nicotianae</i> in FCV tobacco nurseries. 	

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V.Venkateswarlu	E-86: Studies on insect transmitted viral diseases in tobacco	<ul style="list-style-type: none"> • Whitefly populations were monitored by using yellow sticky traps in FCV nursery (11-38 insects per trap) and planted fields (3-20 insects per trap) and burley tobacco planted crop (2-23 insects per trap). • Infected leaf samples collected from various regions using PCR were carried out with coat protein gene specific primers. The results indicated that among the 18 samples analysed, 16 were positive for leaf curl virus with specific amplification of coat protein gene and 2 samples turnout to be negative without any amplification 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I and suggested • Standard procedures are to be adopted for conducting survey. Viruses involved in mixed viral infections are to be identified. Good photos of viral diseases symptoms are to be taken and documented.
B.Sailaja	E-87: Studies on role of Arthropod diversity in tobacco pest management	<ul style="list-style-type: none"> • Among the arthropod samples collected, about 90 % were insects (Sub-phylum Hexapods), 5-6 % were spiders (<i>Chelicerates</i>), 3-4 % constituted millipedes (<i>Myriapods</i>) and pill bugs (<i>Crustaceans</i>) 1 %. • The highest biodiversity was observed in mustard and chickpea crops • Peak incidence of <i>S. litura</i> is 102 moths / pheromone trap/ week during November 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I and suggested • Suggested to analyse the data statistically for drawing valid conclusions.
CTRI RS, Guntur			
P Venkateswarlu	EG-16: Studies on monitoring and management of tobacco leaf curl caused by whitefly, <i>Bemisiatabaci</i> Gennadius in SBS	<ul style="list-style-type: none"> • The IPM module with four rows of Jowar as barrier crop, one spray of flonicamid @ 0.03% at 10 days, one spray of pymetrozine @ 0.03% at 25 days and one spray of imidacloprid @ 0.05% at 40 days of planting exhibited 80.80% reduction of by tobacco leaf curl infestation, 6.76% increase of cured leaf yields with incremental benefit cost ratio of 2.57 over untreated control. 	Approved to conduct a bulk trial and suggested to compile the data of the last three years and submit the RPF III

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CTRI RS, Kandukur			
K. C.Chenchaiah	EK-19: Evaluation of IPM Modules for management of caterpillar and aphid in FCV tobacco under SLS condition	<ul style="list-style-type: none"> • IPM module consisting of Jowar as barrier crop, NSKS 0.5% spray, <i>Spodeptera</i> NPV 250LE spray, Proclaim @ 5g/ 10 L water, Confidor @ 3g/ 10 L water based on ETL was found to be effective and recommended for pest control in FCV tobacco under SLS. 	Pooled data is to be compiled and RPF III is to be submitted
CTRI RS, Hunsur			
S. Ramakrishnan	<p>N-20: Integrated management of root knot nematodes in FCV tobacco</p> <p>Evaluation of new fungicides against <i>Fusarium</i> wilt disease in light soils of Karnataka</p>	<ul style="list-style-type: none"> • Field bean and Cow pea grown in rabi season after <i>Kharif</i> FCV tobacco were infested with root knot nematode with RKI ranged from 2.0 to 4.0 under 0-5 scale. Whereas the other <i>rabi</i> crops such as Sun hemp, Horse gram, Maize and Ragi were found free from root-knot nematode infestations. • Sun hemp as preceding crop reduced 78% root knot nematode population as compared to 60% reduction in Weeded Fallow plot and 48% reduction in Un-Weeded Fallow plot. • Azoxystrobin 23% SC (Amistar) showed significant control against <i>Fusarium wilt</i> disease control to the tune of 59% at 45 DAT in KLS FCV tobacco. 	<ul style="list-style-type: none"> • House suggested change the objective as monitoring of the nematode population instead of survey of nematodes <p>Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I and suggested</p> <ul style="list-style-type: none"> • To check the <i>Fusarium</i> wilt presence in the sick field of the Research Station by isolating the disease causing fungi. • Include the disease severity

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			parameter in addition to taking observations on per cent infected plants. <ul style="list-style-type: none"> • Conduct the trials both in the station as well as in the farmers' fields.(<i>Fusarium</i> sick fields) as proposed in the project.
CROP CHEM. & SOIL SCIENCE			
Dr. C. Chandrasekhara Rao	SS-33. Energy management strategies for curing FCV tobacco	<ul style="list-style-type: none"> • Combination of Agri biomass briquettes (Chickpea/pigeon pea husk and saw dust) and maize rinds along with polycarbonate roof chamber can have the potential to replace the total wood requirement for curing • Fuel wood to an extent of 22.0 to 24.9% can be saved with Polycarbonate roof chamber over the existing barn. • Wood consumption per I kg of cured leaf was 3.99 kg with polycarbonate roof chamber compared to 5.66 kg in traditional barn 	<ul style="list-style-type: none"> • The present project will be concluded and the objectives of the project will be studied under the external funded project entitled 'Development and Evaluation of Solar thermal energy based FCV tobacco curing systems' sanctioned by Tobacco Board with a total financial outlay of Rs. 35.00 lakhs (SP-TB-2). The House approved the proposal.
	OC – 24: Studies on chemical constituents responsible for smoke flavor in tobacco grown under different agro-climatic zones	<ul style="list-style-type: none"> • The results indicated that FCV tobacco grown in NLS, had higher percentage of neophytadiene, terpenoids and carotenoids in the NV fraction compared to TBS. FCV tobacco grown in TBS had higher cembranoids & Thunberganoids. 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I
Dr. J. PoornaBindu	Inter-Institutional project: Investigations on Various Options for Effective Use of Oil Palm Biomass Waste.	<ul style="list-style-type: none"> • The optimized conditions for complete charring of Biomass, Oil palm trunk biomass and Oil palm empty fruit bunch Biomass were 500 °C and holding time of 60, 60 and 90 minutes, with yield recovery of 35.5%, 34.0% and 32.0% respectively. 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I and suggested • To test the oil palm biomass

Presented by	Project Title & Code	Research highlights	IRC recommendation
		<ul style="list-style-type: none"> • The pH of oil palm biochars ranged from 6.55-9.97. CEC of the oil palm fronds, trunk and empty fruit bunch biochars were 12.82, 11.12 and 10.24 C mol (P+) kg⁻¹ respectively • Oil palm empty fruit bunch biomass briquettes along with wood saved 17.4% fuel wood required for curing. • Among the oil palm waste biochars, oil palm empty fruit bunch biochar (1 t ha⁻¹) has shown maximum nutrient uptake at 75 DAP. 	waste as rooting media for tobacco tray seedling production.
Dr. D. V. Subhashini	SSMB 12: Tobacco (<i>Nicotianatabacum L.</i>) and stem assisted green synthesis of silver nanoparticles and evaluation of its antimicrobial activity against agricultural plant pathogens	<ul style="list-style-type: none"> • The silver nanoparticles synthesized by leaf extract of <i>N.tabacum</i> exhibit intense absorption peaks at 3260.07 cm⁻¹ corresponding to N-H stretching of primary amine. • The absorption band at 1627.63 cm⁻¹ represents the C=O stretching of ketones. The peaks observed at 1321.96 cm⁻¹ denotes the N=O stretching of nitro groups. The absorption band at 997.02 cm⁻¹ represents the C-H bonding of alkynes. 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I and suggested • To test the antimicrobial activity of copper nanoparticles along with silver nanoparticles against <i>Pythium aphanidermatum</i> in tobacco nursery
Dr. M. Anuradha	PHYK-1: Abiotic stress management interventions for climate resilient flue cured tobacco production in SLS Domain of A.P.	<ul style="list-style-type: none"> • Application of hydrogel and biochar helped to maintain more soil moisture in the root zone which in turn enhanced productivity by 17.4% and 15.5%, respectively. • Foliar application of Gibberellic acid @ 50 ppm enhanced leaf expansion in flue cured tobacco grown in SLS domain. • Dense planting can be recommended as a Climate Resilient Strategy for FCV tobacco production under rainfed Alfisols of Andhra Pradesh. 	<ul style="list-style-type: none"> • Approved to extend the project for the year 2018-19.

Presented by	Project Title & Code	Research highlights	IRC recommendation
Dr. M. Anuradha	PHYK-2 (Inter Institutional Project): Soil, water and crop management strategies to mitigate climate induced changes in rain fed ecosystem of South Coastal A.P.	<ul style="list-style-type: none"> • Long term weather data analysis of Prakasam and Nellore districts showed decreasing trend in numbers of rainy days and increasing trend in frequency of extreme rain events. It is also observed that wetter regions are becoming wetter and dryer regions are experiencing more dryness. • Higher water use efficiency is recorded with drip method followed by furrow method of irrigation when compared to flood irrigation. 	<ul style="list-style-type: none"> • Approved to continue the project for the year 2018-19 as per the approved work plan in RPF I and suggested
EXTERNAL FUNDED PROJECTS			
Dr. C. Chandra Sekhara Rao	Characterization, Value Addition and Utilization of Tobacco Seed Oil and its By-products	<ul style="list-style-type: none"> • The Tobacco Seed oil administered orally at a concentration of 7 ml/kg rat (2.5 times higher than the Recommended dietary Intake) did not show any adverse effect on any of the parameters studied. There was no mortality recorded • The Bio-similarity of Tobacco seed oil with edible oils was observed. TSO diet-induced hepatic fatty acid compositional changes were similar to that of safflower and sunflower oil-diets. However, a • The feeding of Tobacco seed oil and other edible oils through diet at a dose of 0.8 g/ rat / day to WNIN rats daily for 77 days (equivalent to oil content in standard NIN powder diet) did not induce any abnormalities under experimental conditions. 	<ul style="list-style-type: none"> • House approved to conduct Long-term multi generation study as needed to ascertain the refined tobacco seed oil as an edible oil in collaboration with NIN, Hyderabad.
	Development and evaluation of solar thermal energy based FCV tobacco curing systems	The project was sanctioned with a financial outlay of Rs.35.00 lakhs for a period of two years initially. The project was initiated on 01.02.2018.	---

Presented by	Project Title & Code	Research highlights	IRC recommendation
Dr. L.K. Prasad	Assessment of soil fertility and development of online fertilizer recommendation system for FCV Tobacco growing soils of India	<ul style="list-style-type: none"> • Boundary map of FCV tobacco growing areas under Northern Light Soil developed • Thematic maps of soil fertility of Northern Light Soil area were developed • The available phosphorus content in 88 % of area is high and the highest index value (2.95) observed in Gopalapuram auction platform area • Zinc availability is low in most of the NLS region (very low - 22% and low - 51 % samples) followed by available copper (very low to low - 25%). Zn deficiency in FCV tobacco growing soils is attributed to high level accumulation of soil phosphorus. 	<p>Approved to continue the project for the year 2018-19 as per the approved objectives and suggested</p> <ul style="list-style-type: none"> • Develop critical limits for Cu, Fe, Mn, Zn and Boron for FCV tobacco • Suggested to develop STCR equations for NLS region • Study the relationship between phosphorus and zinc availability with collected soil samples • Soil fertility data of the NLS is to be checked thoroughly before documentation
Dr. K. Suman Kalyani	NICRA Project: Gender specific adaptation programmes in response to climate change in coastal eco-system	<ul style="list-style-type: none"> • Village level Women leader groups were identified and trained in the climate change mitigation and technology sectors. • Climate change mitigation strategies were identified viz. defensive seawalls, marine safety devices, advanced fishing equipment, tracking & navigation devices. • Drudgery reducing implement viz. power operated fish scaler cum gutter was designed. • Cost economics of pilot units viz. Mobile processed seafood units, processing & packaging of fresh fish etc. were evaluated for entrepreneurship and livelihood generation. • Mobile based apps were developed for technology transfer through ICT approach. 	<ul style="list-style-type: none"> • House advised to list the climate change events occurred in coastal ecosystem and programmes undertaken on Gender specific adaptations for the climate change events.
Dr. K. Sarala	Development of Distinctiveness, Uniformity and Stability (DUS) Guidelines for FCV and Bidi Tobacco	<ul style="list-style-type: none"> • A draft table of characteristics (53 No.) prepared and 45 characters recorded in 31 FCV and 15 bidi varieties for DUS characterization 	<ul style="list-style-type: none"> • Project will be continued during the year 2018-19.

New projects presented for approval:

S.No	Title of the project	Investigator	Remarks
	Assessing crop diversification prospects in tobacco growing areas	Dr. B. Hema	House approved the project with the following suggestions. i) Advised to study with the existing bio-physical environment, area and location suitability of other major crops in FCV tobacco growing areas; Identify the institutional mechanism which can provide technical, financial, market, infrastructural, extension and other welfare measures to make the other major crops as best alternatives to tobacco. iii) It is also suggested to work out the pre-dominant farm types in the study area. ii) House advised to modify the title as “Constraint analysis and crop diversification options in FCV tobacco growing areas” and objectives should focus on factors for shift from tobacco to other crops, farmers’ perception and awareness on crop diversification, challenges faced by the farmers in alternative crops and prospects for diversification.
2	Farmers Interest Group-An approach to doubling farmers income	Dr. A. Srinivas	The project is not approved and he was suggested to propose a new innovative project.
3	Enhancing farm income through crop intensification	Dr. S.V. Krishna Reddy	House approved the project with the following suggestions. <ul style="list-style-type: none"> • Change the title of the project as “Productivity enhancement and cost cutting interventions for increased farmers income in NLS tobacco production system”. • To include four more treatments <i>viz.</i>, existing farmers practice, enhancing the farm returns by crop intensification, treatment with best bet technologies and value addition to system productivity, produce and by-products.
4	Mobile app and e-advisory portal on GAPs of FCV tobacco	Dr. H. Ravisankar	This project was approved.
6	Survey and identification of key nematode pests on FCV and Burley tobacco.	M.Venkatesan	The project is not approved and suggested to propose a new project to work out the most effective biocide- biofertiliser and micro nutrient enriched culture for tobacco production.
