

ICAR-CENTRAL TOBACCO RESEARCH INSTITUTE, RAJAHMUNDRY-533105

**PROCEEDINGS OF
INSTITUTE RESEARCH COMMITTEE MEETINGS - 2015**

INAUGURAL SESSION

The Institute Research Committee meetings were held from 24-26 August, 2015. Inaugural Session of IRC 2015 was held on 24.08.2015 between 9.30 AM to 10.45 AM. Dr. K.D. Singh, Former Director, CTRI was the Chief Guest of the Session. In the beginning, Dr. Y. Subbaiah, Principal Scientist, Agricultural Extension invited dignitaries to the Dias. Dr. C. ChandrasekharaRao, Secretary, IRC given the welcome address informing about the purpose and programme of IRC meetings

Formal inauguration of the IRC was done by lighting the lamp by the chief guest and dignitaries. Dr. D. Damodar Reddy, Director, CTRI addressed the delegates and presented the salient research achievements, important activities and also the crop scenario. Dr. K. Deo Singh addressed the delegates and informed that efforts are to be concentrated on developing viable technologies for reducing cost of cultivation, reduction of harmful substances and also alternative fuels for curing the FCV tobacco.

After break, Heads of Divisions at CTRI, Rajahmundry and also Heads of Regional Stations given brief presentation on research achievements of their respective Divisions/ Research Stations. **After that** Tobacco Scientist-Farmer-Trade-Board Interface was held. Dr. K. Gopal IAS, Chairman, Tobacco Board, Dr. D. Damodar Reddy, Director, CTRI, Farmer representatives from different tobacco zones, Trade representatives from ITC- ILTD Division, VST Industries, Indian Tobacco Association, Alliance one International and ML Group of companies participated. Four Technical Sessions were conducted viz. Crop Improvement, Crop Production, Crop Protection and Crop Chemistry and Soil Science. Crop Improvement session was held on 25-08-15 (9.30-13.00 hrs) with Dr.Lakshminarayana as the Chairman and Dr.K.PrabhakaraRao as the Rapporteur. Crop Production session was conducted on 25-08-15 (14.00-16.30hrs) with Dr.K.Deo Singh as the Chairman and Dr.Y.Subbaiah as the Rapporteur. Crop Protection session was conducted on 25.08.15 (16.30 - 17.30 hrs) and extended to 26-08-15 (9.30-11.00hrs) with Dr.K.V.Ramana as the Chairman and G.Raghupathirao as the Rapporteur. Crop Chemistry and Soil Science session was conducted on 26.08.15 (11.00-13.00hrs) with Dr. V.R.Rao as Chairman and J.Poorna Bindu as the Rapporteur. Scientists presented the results of the ongoing research projects, technical programme for 2015-16 and also the new projects proposed. As per the e-mail from ICAR dated 19th September, total no of projects downsized, in each sessions by merging/ concluding the projects. The details were given below.

Presented By	Project Title & Code	Research highlights	IRC recommendation
CROP IMPROVEMENT			
ICAR-CTRI, RAJAHMUNDRY			
Dr. T G K Murthy	Germplasm Acquisition, Maintenance, Evaluation and Utilization (GS-1)	Germplasm resources increased to 3369 and rejuvenated 2266 lines during 2014-15. DUS characterization of 3 elite genotypes has been completed. One copyright on “ <i>Nicotiana</i> species information system” was obtained.	The house suggested that the germplasm management at the Headquarters and the Research Stations may be continued as an important mandatory activity of the Division instead of a research project under the supervision of Head Crop Improvement
	Developing hybrid FCV tobacco suitable for traditional black soil area of Andhra Pradesh (Br-7)	Four CMS hybrids viz., CMSH Nos. 134, 135, 143 and 144 producing over 2640 kg/ha were identified for further evaluation. New alloplasmic CMS source has been identified	The proposed activities approved for 2015-16 and house approved to merge the project with the project Br.2.
	Interspecific hybridization: Incorporation of aphid resistance in <i>N. tabacum</i> from wild <i>Nicotiana</i> species (Cy-2.1F)	Thirty one lines having promise for leaf yield and quality were identified. Eight lines were contributed to AINPT trials; one line, TBST-2, was identified for release, pending manufacturing test	The proposed activities approved for 2015-16 and house approved to merge the project with the project Br.2.

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	Evolving FCV tobacco varieties having high yield and better quality suitable for NLS area of Andhra Pradesh (JL Br-2.1)	Twenty seven new lines with TMV resistance were identified on artificial inoculation. Nine lines were contributed to AINPT trials. Advanced breeding line NLST-4 performed well in bulk as well as on-farm trials.	Approved for continuation of experiments in the ensuing season.
	Developing hybrid FCV tobacco suitable for Northern light soils of Andhra Pradesh (JL Br- 3)	Two CMS hybrids viz., MSH-4 & MSH-5 producing over 3500 kg/ha cured leaf yield as compared to 2726 in Kanchan, identified for further evaluation.	The proposed activities approved for 2015-16. Suggested for further strengthening of hybrid programme and approved to merge the project with JL.Br.2.1
	Developing new varieties of irrigated <i>Natu</i> tobacco for Andhra Pradesh (JLN-2)	New promising advanced cross derivatives with higher yield potential (over 2100 kg/ha CLY) than ruling variety, Kommugudem were developed.	The proposed activities approved for 2015-16 and house approved to merge the project with the project B-50.
Dr. AVSR Swamy	Developing tobacco cultivars for high seed yield, oil content, high biomass and other phyto-chemicals	Crosses exhibited significantly higher total seed yield, high percent of nicotine, solanesol and protein content, total nicotine content, solanesol	It was suggested to logically conclude the project with per hectare economics of each component. Better entries may be evaluated at CTRI RS,

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	(Br-8)	and protein per hectare compared to their parents.	Vedasandur. The house felt that all the experiments with the object of alternate uses are to be under one project and Dr. K. Siva Raju will be the Principal Investigator for that project.
Dr. P VenugopalaRao	Evolving superior varieties of FCV tobacco through hybridization (Br-2)	V-5057 recorded 10 per cent higher yield in green leaf, 12 per cent higher yield in cured leaf and bright leaf and 15 per cent higher grade index over control Siri.	The proposed activities approved for 2015-16.
	Incorporation of disease resistance (Br-6)	Out of 524 progenies evaluated under artificial inoculation, 233 progenies recorded resistance in all the plants in a progeny.	The proposed activities approved for 2015-16 and house suggested to merge the project with the project Br.2.
	Evaluation of advanced burley breeding lines for productivity and quality (ByBr-1.3)	Lines YB 27, YB 33 and YB 31 were showed higher Yield than control Banket A 1	The proposed activities approved for 2015-16 and house suggested to merge the project with the project B-50
Dr. K. Sarala	Molecular Mapping of Important Tobacco Traits (Biotech-6)	Immortal mapping populations developed for important tobacco traits. Eleven out of 22 SSR markers tested were found to be polymorphic among parents of	The proposed activities approved for 2015-16.

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		RIL populations	
	Evaluation of advanced breeding lines for yield and quality (MB-9)	Line RS 27 found promising at Katheru Farm and clones, NLCR-1-9-2-13, NLCR-7-11-1-4, NLCR-BT2-P9 and NLCR-9-2 at CTRI RS Jeelugumilli. In the bulk trial at Jeelugumilli, all the entries viz., Tobios-6, Tobios-2, Tobios-7, FCJ -3, Tobios-3 and FCJ-4 recorded higher cured leaf yields (15-73%) than Kanchan	The proposed activities approved for 2015-16 and house approved to merge the project with the project Br.2
Dr. K. PrabhakaraRao	Transcript profiling and identification of candidate genes resistant to Damping-off in tobacco (Biotech-9)	Transcript analysis revealed that four defence related genes are implied to be associated with the damping off disease tolerance mechanism in Tobacco.	The project was concluded.
	Molecular characterization and cataloguing of genus <i>Nicotiana</i> using DNA barcoding (Biotech-10)	The rapid evolving loci trnH-psbA (intergenic spacer region) is found to be polymorphic among the <i>Nicotiana</i> accessions with respect to amplicon length and sequence	The proposed activities approved for 2015-16 and house suggested to merge the project with the project Biotech-6.
ICAR-CTRI RESEARCH STATION, GUNTUR			

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Dr. P. Venkateswarulu	Development of high yielding FCV varieties suitable for cultivation in SBS and CBS areas of Andhra Pradesh (Br-15)	Line RT 42-1 and T-61 were found superior over the checks.	House suggested for conclusion of experiment.
ICAR-CTRI RESEARCH STATION, KANDUKUR			
Dr. K C Chenchiah	Breeding FCV tobacco varieties for yield and quality Characters under SLS conditions (KBr-6)	The test entries R-11 and R-15 are significantly superior to all the check varieties	Suggested to conduct bulk trial with R-11 and R-15 with a population of minimum 500 plants.
ICAR-CTRI RESEARCH STATION, HUNSUR			
Dr.C . Nanda	Germplasm maintenance of <i>Nicotiana tabacum</i> varieties / lines (BR-12)	170 germplasm accessions were regenerated. Incorporation of male sterility from varied sources into Kanchan, Rathna, Coker 371G, FCH 201, FCH 221 and FCH 222 was carried out	The germplasm management will be taken up as an important mandatory activity under the supervision of Head, Division of Crop Improvement instead of a research project.
	Development and evaluation of F ₁ hybrids and advanced breeding lines of FCV tobacco	Two lines viz., FCH 239 and FCH 242 were found to be promising.	House suggested for discontinuation of selection FCH 239. Approved for continuation of the project

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	suitable to Karnataka Light Soil region (BR-19 & 19A)		with a suggestion to target the yield improvement, especially through hybrids. Also suggested for collecting the every detail of KLSH-10 including incidence of pests and diseases along with the photographs.
ICAR-CTRI RESEARCH STATION, VEDASANDUR			
Dr. M. Kumaresan	Breeding for high seed and oil yield in Tobacco (B-50)	10 selections which recorded seed yield ranging from 1500-1950 kg ha were retained for replicated yield evaluation for seed and oil yield in the coming season.	House approved for the continuation of project in the ensuing season. The house suggested for conducting trial of the released varieties.
	Evaluation and maintenance of Germplasm (GS-1)	Eighty five chewing and sixty cigar and cheroot germplasm accessions were maintained.	The germplasm management will be taken up as an important mandatory activity under the supervision of Head, Division of Crop Improvement instead of a research project.
CROP PRODUCTION			
ICAR-CTRI, RAJAHMUNDRY			
Dr. S. Kasturi Krishna	Chemical management of <i>Orobanche</i> in FCV tobacco (A-83)	<ul style="list-style-type: none"> • <i>Orobanche</i> infestation was reduced and yield improvement was there 	Comprehensive studies need to be initiated on Integrated Management of <i>Orobanche</i> .

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		<p>when Glyphosate was applied @50 g ai/ha without any phytotoxicity .</p> <ul style="list-style-type: none"> • PPI of Pendimethalin@ 325 g ai and Alachlor 1000 g ai/ ha recorded on par yields with that of hand removal of <i>Orobanche</i> 	<p>Suggested to evaluate FCV tobacco in the off- season as a trap crop to <i>Orobanche</i> in endemic plots at NLS farm. Approved to continue in 2015-16 season</p>
<p>Dr. S. V. Krishna Reddy</p>	<p>Studies on false maturity and its mitigation strategies in FCV tobacco growing zones of Andhra Pradesh. A. Vertisol conditions and B. Irrigated Alfisols (A 84)</p>	<ul style="list-style-type: none"> • Application of organic manure (FYM) + balanced NPK plot, regular inter-culture with complete weeding and <i>Orobanche</i> (broomrape) removal did not express false maturity. The cv.VT-1158 performed better followed by TBST-2 without false maturity inVertiasols. <p>Irrigated Alfisols</p> <p>Under irrigated Alfisols application of FYM + balanced NPK (reco.) and FYM + (excess N) rec.PK plots, Decanal (2%) + pendimethalin (0.3%) followed by decanal (4%)</p>	<p>Suggested to extend the project to SLS during 2015-16 season and advised to include Dr. K. Chenchiah, Principal Scientist (Entomology), CTRI RS, Kandukur as Co-PI of the project. House suggested to study the factor contribution to false maturity.</p>

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		and pendimethalin (0.6%), Irrigation as per schedule, Regular inter-culture did not express false maturity symptoms	
Dr. S. Kasturi Krishna	Leaf biomass and seed yield improvement in advanced breeding lines for alternative uses (A- 85)	<ul style="list-style-type: none"> • HDBRG at 80 x40 spacing with 150:75:75 NPK kg/ha recorded higher leaf yields of 410.32 q/ha. • Line RT 51-1 with 60 x40 spacing and 150:75:75 NPK kg/ha recorded higher nicotine yields. • HDBRG with 70 x40 spacing and 150:75:75 NPK kg/ha recorded higher solanesol yield of 55.10 kg/ha and higher protein yield of 925.7 kg/ha. 	As the project was conducted for two years, suggested to draw the conclusions. House suggested to review the concluded experiments on biomass production.
BTRC, KALAVACHARLA			
Dr.C.ChandraSekharaRao	Evaluation of set row planting in burley tobacco for efficient resource conservation and utilization (AB-30)	<ul style="list-style-type: none"> • Set row planting with 100% RDF showed significantly higher Greenleaf yield, cured leaf yield and N,P, K uptake. SRP with 75% and 50% RDF and CP with 100% RDF being at par showed 	The project will be continued during the season 2015-16. Suggested to record the incidence of insect pests and diseases in set row planting. House felt that the soils at BTRC, Kalavacharla are not

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		significantly higher green leaf yield and cured leaf over control.	ideal soils for burley cultivation and also not representative to the soils of burley tobacco growing areas in Andhra Pradesh. Director, ICAR-CTRI advised Dr.Kasturi Krishna, Scientist-in-charge, BTRC, Kalavacharla to submit a detailed report on crop situation, yields and reasons for lower yields at BTRC Farm so as to take a decision on continuation of BTRC at Kalavacharla village.
Dr. S. Kasturi Krishna	Effect of fertiliser source of nutrients on yield and quality of burley tobacco grown in uplands (AB-31)	<ul style="list-style-type: none"> Application of CAN/Ammonium sulphate along with DAP in 1st dose and CAN in 2nd dose gave higher green and cured leaf yields. 	Suggested to conclude the project.
ICAR-CTRI RESEARCH STATION, JEELUGUMILLI			
Dr.S.V.Krishna Reddy	Effect of drip irrigation and tray seedlings on the productivity of NLS tobacco (JLA-37)	<ul style="list-style-type: none"> Drip irrigation, tray seedlings, drip fertigation at 3rd, 20-25 and 40-45 DAP increased green leaf yield by 23.87%, cured leaf yield by 16.67% and grade 	Suggested to take up bulk trial during the season 2015-16.

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		index by 23.44% when compared with furrow irrigation, normal seedlings, soil application of fertilizers at 10, 25-30 and 40-45 DAP.	
Dr. C. Chandra SekharaRao	Alternative and cheaper source of nitrogen to FCV tobacco in Northern Light Soils of Andhra Pradesh (JLA-37(1))	<ul style="list-style-type: none"> Application of urea/ AS as basal dose followed by urea or AS or Urea+ AS or Urea + AS+ KNO₃ or Urea + AS + CN were at par in green leaf yield or cured leaf yield, grade index and chemical quality parameters and nutrient composition 	Continuous application of SSP as a source of calcium may lead to accumulation of lead and cadmium in the soil. Hence, suggested to include NPK + calcium fertilizer source available in the open market as one more source of N. Approved to continue in 2015-16 season
ICAR-CTRI RESEARCH STATION, HUNSUR			
Dr. M. Mahadevaswamy	Feasibility of producing organic tobacco in KLS (A-38)	<ul style="list-style-type: none"> The bright grade production was increased by 6-7% due to organic cultivation The cured leaf nicotine content was drastically reduced by 100% organic compared to inorganic fertilizers. 	Suggested to conclude the project and to continue trial in bulk plots.
	Potassium nutrition management strategies	<ul style="list-style-type: none"> Application of 100 kg K₂O/ha in 4 splits (at 	The project will be continued during the season 2015-16. As

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	for productivity and quality enhancement of FCV tobacco grown under rainfed environment in KLS (A-40)	<p>sowing, 25 DAS, 35 DAS and 45 DAS) recorded significantly, dry matter and higher number of transplantable seedlings per unit area compared to 25 or 50 kg/ha.</p> <ul style="list-style-type: none"> • 120 kg K₂O/ha applied in 4 splits at (10, 25, 40 & 55 DAT) recorded the maximum CLY and TGE and was significantly superior to the same dose at one or 2 splits in the transplanted crop. 	majority of the farmers are opting for tray nurseries, house suggested to take the treatments directly to the tray nurseries. The house approved to merge the project with SS 31
	Studies on climate risk management in FCV tobacco based cropping systems in STZ of Karnataka (A-41)	<ul style="list-style-type: none"> • FCV tobacco productivity tend to increase with increase in the number of rainy days, positively and significantly correlated with the sun shine hours during the crop growing season • Standard weeks No. 23 as well as 26th week seems to be critical during which the PET exceeds the rainfall by more than twice during which judicious drought management practices 	Suggested to correlate the critical stages of crop growth with soil moisture and rain fall. Suggested to take up a feeler trial on growing of FCV tobacco in <i>rabi</i> by taking popular FCV tobacco cultivars of KLS. Approved to continue in 2015-16 season

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		needs to be adopted	
ICAR-CTRI RESEARCH STATION, VEDASANDUR			
Dr. M. Kumaresan	Crop productivity, soil quality and economic returns under chewing tobacco +Annual moringa intercropping system in response to nutrient management (A-102)	<ul style="list-style-type: none"> Annual moringa at different levels of population intercropped in chewing tobacco did not affect the yield of chewing tobacco. Recommended dose of fertilizer at 100% level to tobacco (125 N+50 P₂O₅+50 K₂O kg/ha) is essential for getting higher yield and net returns in chewing tobacco in chewing tobacco + Annual moringa intercropping system. 	Suggested to conclude the project and advised to record the data from existing crop. Advised to initiate the new project proposal in consultation with HOD.
ICAR-CTRI RESEARCH STATION, DINHATA			
S. Mandi	Permanent manurial trial on <i>Motihari</i> tobacco (A-10)	<ul style="list-style-type: none"> Application of 112 kg N + 112 Kg P₂O₅ + 112 kg K₂O ha-1 recorded significantly higher green, cured and first grade leaf yields of <i>Motihari</i> tobacco 	Suggested to drop comparative economic analysis of long term fertilizer regimes used for <i>Motihari</i> tobacco. Further suggested to observe Fauna, Flora and yield differences once in 4 years.
	Optimisation dose of Nitrogen with spacing in	<ul style="list-style-type: none"> Spacing 90 cm X 75 cm and Nitrogen dose 150 Kg ha-1 	Suggested to conclude the project and advised to discuss

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	pipe line variety of <i>Jati</i> tobacco in North Bengal (A-71)	recorded higher green, cured and first grade leaf yields.	with, Head, Div. of Crop Production for initiating other research work.
AGRICULTURAL EXTENSION			
Dr. Y. Subbaiah	On-Farm Evaluation of Advanced Breeding Lines (Ag. Extension-50)	<ul style="list-style-type: none"> Farmers preferred Tobios-6 followed by Tobios-2, NLST-4 over cv: Kanchan due to their high yielding potential 	The project will be continued during the season 2015-16. The house approved for merging the projects Ag. Extension-51 and Ag. Extension-52 into the project Ag. Extension-50
	On Farm Demonstrations and Front Line Demonstrations (Ag. Extension-51)	<ul style="list-style-type: none"> Variety TBST-2 found suitable to NBS, SBS & SLS areas for achieving higher production efficiency and net returns 	The house approved the merging of the project with Ag. Extension-50
	Impact Analysis of CTRI Technologies (Ag. Extension-52)	<ul style="list-style-type: none"> Adoption of CTRI Technologies contributed to improved yield & quality and reduction in cost of cultivation. 	The house approved the merging of the project with Ag. Extension-50
Dr. K. SumanKalyani	Nutritional Security in Tribal Areas of East Godavari District Through Community Based	<ul style="list-style-type: none"> Soya milk production by the self-help groups has opened avenues for entrepreneurship among 	The project will be continued up to December, 2015.

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	Approaches (DBT)	tribal women. <ul style="list-style-type: none"> • Solar drying of food products viz., fruits and vegetables is better compared to sun drying in preservation of color flavour, taste, texture and shelf life. • Different entrepreneurial activities introduced were found remunerative for the tribal self-help groups. 	
AKMU			
Dr. H. Ravisankar	Tobacco Agridaksh : An online expert system (ARIS-15)	<ul style="list-style-type: none"> • Developed home page for tobacco agridaksh with necessary components and linked to IASRI agridaksh website for global accessing • Developed knowledge base system for tobacco diseases as a 1) retrieval system 2) ontology based system for identification of diseases • 	The project will be continued during the season 2015-16.
CROP PROTECTION			

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ICAR-CTRI, RAJAHMUNDRY			
Dr. U. Sreedhar	Bio-efficacy and field evaluation of new insecticides against tobacco pests (E-81)	<ul style="list-style-type: none"> • Chlorfluazuron 5.4 EC 0.03% was found highly effective against <i>Spodoptera litura</i> Fabricius in tobacco nurseries as well as planted crop of FCV tobacco. • Chlorfenapyr 10 SC @ 0.01% was found effective against <i>Spodoptera litura</i> Fabricius in FCV tobacco planted crop. • Flonicamid 50 WG and pymetrozine 50 WG @ 0.02% were found promising against tobacco aphid, <i>Myzus nicotianae</i> Blackman infestation in FCV tobacco • Pymetrozine 50 WG @ 0.02%, flonicamid 50 WG @ 0.02% and spiromesifen 240 SC @ 0.02% were promising against tobacco whitefly <i>Bemisia tabaci</i> (Gennadius) on FCV tobacco. 	<p>Suggested to subject the data of the completed experiments to pooled analysis and work out C: B ratios.</p> <p>The house approved for merging the projects E-83, E 85, PP-79, PP-80 into the project E 81 as the objectives being broadly similar.</p> <ul style="list-style-type: none"> • The title of the project is to be modified by replacing the word “Insecticides” with “Pesticides”. The project was approved to be extended for three more years up to 2018 in view of RAC recommendations.

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		<ul style="list-style-type: none"> The residues in FCV tobacco treated with flonicamid 50 WG @ 0.02% and Pymetrozine 50 WG @ 0.02% were less than 1 mg/kg 15 days after spray. 	
	<p>Management of ground beetle, <i>Mesomorphus villiger</i> in FCV tobacco (E-83)</p>	<ul style="list-style-type: none"> Ground beetle <i>Mesomorphus villiger</i> Blanchard could be managed with seedling root dip- Imidacloprid 70 AF @ 0.14% or transplant water treatment with imidacloprid 200 SL @ 0.005%. 	<p>Suggested to conduct bulk trial with the effective treatments and the house approved the merging of the project with E-81.</p>
	<p>Studies on bio-ecology and management of <i>Helicoverpa armigera</i> in tobacco as oil seed crop (E-85)</p>	<ul style="list-style-type: none"> The chemical control module consisted of three sprays of flubendiamide 480 SC @ 0.012%, novaluron 10 EC@ 0.01% and chlorantraniliprole 25 SC @ 0.0075% at flowering, capsule formation and seed filling stages recorded least infestation, seed capsule damage and higher seed yield followed by IPM module (spray of NSKS 2% and Ha NPV at flowering 	<p>It was approved to merge the project with E 81 and drop 2 objectives (To study the population dynamics of <i>H.armigera</i> and its natural enemies at reproductive stage of the crop & to construct life tables of the pest on the high seed yielding tobacco lines). As Dr. S. Gunneswararao superannuated the house approved to include Dr. G. RaghupathiRao as Co-PI.</p>

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		and capsule formation, and need based spray of chlorantranaliprole 25 SC @ 0.0075% and novaluron 10 EC@ 0.01%).	
Dr. S.K. Dam	Efficacy of new fungicides for the management of Frog eye spot disease in tobacco caused by <i>Cercospora nicotianae</i> (PP-79)	<ul style="list-style-type: none"> Two sprays either with pyraclostrobin + metiram @ 0.2% or carbendazim @ 0.05% immediately after appearance of the disease followed by another spray at 10-15 days interval found effective in checking disease incidence, increasing yield and quality parameters of FCV tobacco. 	The house approved the merging of the project with E 81.
	Efficacy of new fungicides for the management of leaf blight disease in tobacco nursery caused by <i>Phytophthora parasitica</i> sp. <i>nicotianae</i> (Breda de Haan) Tucker (PP-80)	<ul style="list-style-type: none"> Under in vitro conditions all the fungicides were found inhibitory to the fungus with varied degree of inhibition. Application of fenamidone 10% + mancozeb 50% @ 0.3% is a promising alternative to metalaxyl 8% + mancozeb 64% for the management of leaf blight 	The house approved the merging of the project with E 81.

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		<p>disease in tobacco nurseries</p> <ul style="list-style-type: none"> All the recommended fungicides against <i>Phytophthora parasitica</i> f. sp. <i>nicotianae</i> and <i>Pythium aphanidermatum</i> were found compatible with insecticides, emamectin benzoate and imidacloprid at their respective recommended doses 	
ICAR-CTRI RESEARCH STATION, JEELUGUMILLI			
Dr. G. RaghupathiRao	Evaluation of insecticide application technology for effective spray coverage on FCV tobacco in NLS (E-82)	<ul style="list-style-type: none"> Use of Hi tech sprayer was superior till 50 DAP and thereafter HPKS in saving of spray fluid and time over compression sprayer. Hi tech sprayer showed superior performance up to 50 DAP in suppressing incidence of leaf eating caterpillar, <i>S.litura</i>, aphids, <i>M.nicotianae</i> and <i>H.armigera</i>. 	<p>Extend the project for 2 more years in order to study the following objectives.</p> <ul style="list-style-type: none"> Estimation of spray fluid losses on the ground while spraying in the field. Influence of nozzle discharge rate on spray fluid requirement, spray characteristics and insect pest incidence on tobacco crop. Evaluation of new battery

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		<ul style="list-style-type: none"> Application of imidacloprid 200 SL formulation through Hi tech sprayer, 40PSI @ 450 ml/min characterized by superior spray characteristics with higher coverage and uniformity coefficient over 70 WG. 	operated sprayer on tobacco
ICAR-CTRI RESEARCH STATION, GUNTUR			
Dr. P. Venkateswarlu	Validation of IPM module against tobacco aphid, <i>Myzus nicotianae</i> under CBS conditions (EG-14)	<ul style="list-style-type: none"> The bio-intensive IPM module with two rows of maize border as barrier crop, one spray of <i>Verticilliumlecanii</i> @ 3X10¹² CFU/ha at 50 DAP and one spray of imidacloprid @ 50g a.i./ha at 60 DAP exhibited cent percent reduction of infestation by tobacco aphid under low level of infestation Two recommended pesticides viz., imidacloprid 0.03% and thiomethaxam 0.02% applied at 50 and 60 days of planting, respectively also reduced aphid 	No valid conclusions can be drawn as the natural infestation of aphid is very low. The scientific name of the aphid may be corrected as <i>Myzus nicotianae</i> (Blackman). Approved to conduct the project for 2015-16 season.

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		infestation by 100% over untreated control.	
	Survey for assessment of insect pest incidence in tobacco and tobacco based cropping systems of CBS and SBS (EG-15)	<ul style="list-style-type: none"> A survey covering major tobacco growing areas of CBS and SBS during 2014-15 revealed that leaf curl caused by whitefly, <i>Bemecia tabaci</i> and caterpillar, <i>Spodoptera litura</i> were the main pests in planted crop and nursery with 7.4 and 2.4% infestations, respectively. 	Suggested to conclude the project and monitor the incidence of tobacco pests as a part of surveillance.
ICAR-CTRI RESEARCH STATION, HUNSUR			
Dr. S. Ramakrishnan	Survey for plant parasitic nematodes associated with tobacco (N-1.1)	<ul style="list-style-type: none"> Five major plant parasitic nematodes viz., <i>Meloidogyne spp</i>, <i>Rotylenchulus reniformis</i>, <i>Helcotylenchus spp</i>, <i>Pratylenchus spp</i> and <i>Tylenchu ssp</i>, associated with main field tobacco crop in KLS. Maximum mean population of root knot nematodes were found in Periyapatna region followed by Hunsur, Arkalgud and H.D.Kote. 	Suggested to conclude the project and carryout surveillance on nematodes in tobacco, as a routine work.

Presented By	Project Title & Code	Research highlights	IRC recommendation
	<p>Integrated management of root knot nematodes and soil borne fungal diseases in FCV tobacco nursery (N-20)</p>	<ul style="list-style-type: none"> • Integrated application of <i>Trichoderma viride</i> & <i>Paecilomyces lilacinus</i>, <i>Trichoderma viride</i> and <i>Pochania chlamydosporia</i> along with ridomil and furadon in solarised nursery beds were on par with each other in recording decreased root knot index to the tune of 49.2 and 48.7 percent respectively and also decreased damping-off + blight disease incidence in nursery beds to the tune of 57.14 percent over untreated check. 	<p>House approved to merge (N 21 & P 3.2) projects with N-20 with title Integrated management of root knot nematodes in FCV tobacco and approved to continue in 2015-16 season</p>
	<p>Evaluation of bio-agents enriched tray seedlings against Root Knot Nematode-<i>Fusarium</i> wilt disease complex in FCV tobacco field crop (N-21)</p>	<ul style="list-style-type: none"> • <i>T.viride</i> (50g) + <i>P.lilacinus</i> (50g) enriched tray seedlings, <i>T.viride</i> (50g) + <i>P. chlamydosporia</i> (50g) enriched tray seedlings and <i>T. viride</i> (30g) + <i>P.lilacinus</i> (30g) + <i>P. chlamydosporia</i> (30g) were on par with each other in increasing the cured leaf yield by 	<p>House approved to merge (N 21 project with N-20 with title Integrated management of root knot nematodes in FCV tobacco.</p>

Presented By	Project Title & Code	Research highlights	IRC recommendation
		<p>10.0, 9.5 and 10.5 per cent respectively over check.</p> <ul style="list-style-type: none"> • These effective treatments also decreased the root knot index by 46.0, 49.1 and 51.0 per cent and wilt disease incidence by 46.1, 42.3 and 51.3 per cent respectively over check. • The chemical control schedule, furadon + carbendazim at the time of planting was found to be the best in decreasing the <i>Fusarium</i> wilt disease by 59.0 per cent over check under field conditions. 	
	Screening of tobacco germplasm against root-knot Nematodes (P-3.2)	<ul style="list-style-type: none"> • The lines FCR28 and FCJ22 recorded RKI ≤ 1.0 and were found promising against root knot nematode under sick field conditions. 	House approved to merge P 3.2 project with N-20 with title Integrated management of root knot nematodes in FCV tobacco.
	CROP CHEMISTRY AND SOIL SCIENCE		
	ICAR-CTRI, RAJAHMUNDRY		
Dr. D. Damodar Reddy	Evaluation of Crop	<ul style="list-style-type: none"> • Biomass ashes resulting 	Approved to continue in

Presented By	Project Title & Code	Research highlights	IRC recommendation
	Residue and Wood Ashes - Effects on Soil Fertility and Potassium Nutrition of Tobacco (SS-31)	<p>from crop residue burning or wood ash from tobacco curing barns can serve as potential liming material and increase pH of acid soils.</p> <ul style="list-style-type: none"> • Use of biomass ashes (rich in potassium) as soil amendments can potentially improve K-fertility of soil as evidenced from increased levels of K availability in biomass amended soils. • Application of crop residue/wood ashes either alone or in combination with SOP (50% + 50%) on 100 kg K ha⁻¹ equivalent basis caused a significant increase in tobacco cured leaf yield and K uptake without affecting the leaf quality. The relative yield of tobacco with different biomass ash treatments ranged from 88 to 98% at Hunsur and from 98 to 105% at Jeelugumilli, indicating that the biomass 	2015-16 season

Presented By	Project Title & Code	Research highlights	IRC recommendation
		ashes can serve as potential sources for K supplementation for FC tobacco on light textured Alfisols.	
J. Poorna Bindu	Evaluation of organic and inorganic soil amendments to minimize nutrient leaching losses and enhance nutrient use efficiency under NLS tobacco production system (SS-32)	<ul style="list-style-type: none"> • System operating conditions for tobacco stems were optimized and the conditions were of 500 °C for 90 minutes with the recovery of 40%. • Biochar from tobacco stems is characterized by high content of TOC (80%), N (1.23), P (0.78%), K (3.48) and alkaline pH of 9.42. • The cation exchange capacity of tobacco stem biochar and synthetic zeolite were 30 and 270 C mol (p+) kg⁻¹ respectively. 	Approved to continue in 2015-16 season
Dr. D.V. Subhashini	Tobacco (<i>Nicotianatabacum</i> L.) andstem assisted green synthesis of silver nanoparticles and evaluation of its antimicrobial activity against agricultural plant	<ul style="list-style-type: none"> • SEM analysis showed that the silver nanoparticles synthesized from <i>N. tabacum</i> leaf are spherical to irregular in shape. • The average particle size (z-average) was found to 	Suggested that instead of synthesizing silver nanoparticles which is difficult task, experiments at small scale for testing pesticide delivery are to be initiated with the nano particles available in the

Presented By	Project Title & Code	Research highlights	IRC recommendation
	pathogens (SSMB-12)	<p>be 10853.3nm and a PDI value of 1.884 while zeta value was found to be -29.1mV with a peak area of 100% intensity.</p> <ul style="list-style-type: none"> • TEM study showed that the size varied from 26.8-36.8 nm to 36.9-53.3 nm 	market. The project is approved for continuation for one year.
Dr. M. Anuradha	Secondary nutrient deficiency effects on tobacco Nutrition (PHY-77)	<ul style="list-style-type: none"> • Secondary nutrients play important role on plant growth, metabolism and nutrient uptake under sufficient supply condition of primary nutrients (N, P and K) and in the absence/deficient condition of primary nutrients, omission of secondary nutrients didn't show much effect. 	Project concluded.
Dr. K. Siva Raju	Evaluation of tobacco leaf and product quality (OC-24)	<ul style="list-style-type: none"> • Among the nine <i>bidi</i> tobacco varieties the variety MRGTH1 showed maximum NVAC • Lenolenate is the major unsaturated fatty acid present in <i>bidi</i> tobacco. 	Approved to continue in 2015-16 season
ICAR-CTRI Research Station, Kandukur			

Presented By	Project Title & Code	Research highlights	IRC recommendation
Dr. L.K. Prasad	Assessment of leaf quality of FCV tobacco using hyper-spectral remote sensing and growth parameters (SSK-2)	<ul style="list-style-type: none"> • Identified the sensitive bands in canopy spectral reflectance for leaf potassium at 747 - 862 nm, nicotine 539-541 nm and 710 nm and reducing sugars: 631-692 nm and 1901-1970 nm. • Canopy spectral reflectance band 350-365 nm had highest positive correlation (R= 0.65) with leaf total nitrogen 	Approved to continue in 2015-16 season

New projects presented and approved.

S.No	Title of the project	Investigator	Remarks
1	Biogenesis and regulation of TSNA (Tobacco Specific Nitrosamines) in Tobacco'	Dr. K. Prabhakara Rao	The project was discussed thoroughly and the house approved the project proposal
2	Monitoring and management of insecticide resistance in tobacco caterpillar, <i>Spodoptera litura</i> (F)"	Dr.G. Raghupathi Rao	Approved by the house to conduct the experiment as a part of E 81 project
3	Evaluation of IPM modules for the management of caterpillar and aphid in FCV tobacco under SLS conditions	Dr K.C. Chanchaiah	Approved with some corrections viz: i- Novaluron 100 g a.i./ha and thiomethoxam 50 g a.i./ha. House suggested to obtain <i>Verticillium lecanii</i> from NBAll, Bengaluru.
4	"Chemical control of <i>Fusarium</i> wilt in KLS region"	Dr. Ramakrishnan	The project was approved as a part E 81
5	Evaluation of abiotic stress management interventions for climate resilient flue cured tobacco production in SLS Domain of A.P."	Dr. M. Anuradha	Project was approved with modifications in the title, change in variety and treatments. Title: "Abiotic stress management interventions for climate resilient flue cured tobacco production in SLS Domain of A.P."

List of merged projects

S. No.	Project title with code	Projects merged	Investigators (from the Division)
DIVISION OF CROP IMPROVEMENT			
1.	Evolving superior varieties of FCV tobacco through hybridization (Br.2.)	Br 6.1.4, MB-9, Br.7 and Cy2.1F merged with Br.2	Dr. T G K Murthy, Dr. P V Venugopala Rao Dr. K. Sarala Dr. A V S R Swamy Dr. K. Prabhakara Rao
2.	Evolving flue-cured tobacco varieties having high yield and better quality suitable for NLS area of Andhra Pradesh (JL.Br.2.1)	JL.Br.3 merged with JL.Br.2.1	Dr. A V S R Swamy Dr. T G K Murthy Dr. K. Sarala Dr. K. Prabhakara Rao
3.	Breeding FCV Tobacco varieties for yield and quality under Southern Light Soil (SLS) conditions (K.Br.6)	K.Br.9 merged with K.Br.6	Dr. P V Venugopala Rao
4.	Breeding non FCV tobacco types (B-50) for desirable traits.	JLN-2 and By.Br.1 merged with B-50	Dr. A V S R Swamy Dr. T G K Murthy
5.	Molecular Mapping of Important Tobacco Traits (Biotech-6)	Biotech-10 merged with Biotech-6	Dr. K. Sarala Dr. K. Prabhakara Rao
CROP PRODUCTION			
1	Technology evaluation demonstration and impact analysis (Ag Exten-50)	Ag. Extension - 51 & Ag. Extension- 52 merged with Ag. Extension-50,	Dr Y. Subbaiah Dr Suman Kalyani
CROP PROTECTION			
1	Bio efficacy and field evaluation, of new pesticides against tobacco insect pests and diseases (E-81)	E-83, E-85, PP-79 and PP-80 merged with E-81 The new experiment proposed by Dr.	Dr U Sreedhar Dr G. Raghupathi Rao Dr S. Ramakrishnan Dr S.K. Dam

		Ramakrishnan was approved as a part of E-81	
2	Integrated management of root knot nematodes in FCV tobacco (N-20)	N-21 and P- 3.2 merged with N-20	Dr. S. Ramakrishnan
CROP CHEMISTRY & SOIL SCIENCE			
1	Evaluation of crop residue and wood ashes effects on soil fertility and potassium nutrition of tobacco (SS-31)	A-40 (Hunsur) merged with SS-31	Dr.Damodar Reddy Dr S.Kasturi Krishna Dr M Mahadeva Swamy Dr L.K. Prasad Dr. K. Nageswara Rao J. Poorna Bindu Dr C.C.S.Rao