

## **PROCEEDINGS OF INSTITUTE RESEARCH COMMITTEE MEETING-2016**

Inaugural Session, Tobacco Scientist- Farmer- Board- Trade Interface and  
Presentations by Heads

Date: 18.08.2016

Chairman : Dr. D. Damodar Reddy  
Rapporteur: Dr. Y. Subbaiah

The inaugural session of the Institute Research Committee (IRC) meeting was held on 18<sup>th</sup> August, 2016. Dr.Y. Subbaiah, Principal Scientist (Agricultural Extension) invited dignitaries to the dais. The session started with welcome address to the delegates and dignitaries by Dr. C. Chandrasekhara Rao, Head, Div. of Crop Chemistry and Soil Science. Dr. C. Chandrasekhara Rao informed the importance, objectives and programmes of IRC. Dr. K. Deo Singh, Former Director, ICAR-CTRI graced the IRC meeting as Chief Guest and inaugurated the meeting by lighting the lamp.

Dr. D. Damodar Reddy, Director, ICAR-CTRI and Chairman, IRC delivered the Chairman's address and wished for the active involvement of scientists, tobacco board officials, industry and farmer representatives in deliberations so as to improve the research programmes. Dr. Reddy presented the revised mandate of ICAR-CTRI, Vision, Mission, Staff position and salient achievements of CTRI during 2015-16. He also mentioned the various mandatory activities implemented by the ICAR-CTRI as per the guidelines of the Council.

Dr. K. Deo Singh, Chief Guest, congratulated the scientists for their good work and emphasized the need to reorient the research programmes of ICAR-CTRI in order to achieve added economic benefits to tobacco farmers. He said the issues like cropping systems, precision farming, use of solar and wind energy, molecular and biotechnology and consumer health to be born in mind while formulating research programmes. Also, highlighted the need to focus on farmers' happiness & prosperity and suggested to explore the possibility of use of tobacco seed oil as bio-diesel.

### **Tobacco Scientist-Farmer - Board -Trade Interface**

Tobacco Scientist - Farmer - Board - Trade interface meeting was held between 11.00 hrs to 13.30 hrs on 18.08.2016. The meeting was attended by the scientists of ICAR-CTRI, Managers of tobacco board, tobacco industry and farmers representatives to voice their opinion on various issues relating to tobacco. Dr. D. Damodar Reddy, Director, ICAR-CTRI in his opening remarks mentioned the purpose of stakeholders meet and appealed to all the participants for their active participation and to become partners in enhancing farm production efficiency and farm returns on sustainable basis. He said the productivity levels in India are lower as compared to global average and specified the areas like low yields in SLS, broomrape menace in SBS & NLS, CPA residues, basic research on broomrape, micro

nutrient issues, environmental implications and online based technology prescriptions.

Regional Manager, Tobacco Board, Rajahmundry said that the farmers have no clarity on targeted produce and touched upon the need for appropriate sampling procedure to be followed for collection of leaf samples for analysing the CPA residues. Further, he said that the price stability is vital to attain market stability and implored for quality commensuration price by the trade.

Dr. Mani, Chief Scientist, ITC-ABD-ILTD said that the demand is more for low nicotine tobaccos globally and stated that the use of additives and flavors to tobacco products is banned. Further, he said crop rotation and use of bio-fertilizers play a vital role in maintaining the soil productivity and for obtaining increased yields coupled with quality.

General Manager, GPI Ltd. felt the need for improved varieties in burley tobacco owing for augmenting demand and increase in burley crop size. He indicated that the produce which is free from CPA residues and NTRM is further attracting the attention of importers and stated that India is considered as opportunist market for tobacco and as such felt the need for stability in production. Director, ICAR-CTRI suggested to send the burley seed indents in advance and directed Dr. P. Venkateswarlu, Head, CTRI RS, Guntur to take care of burley seed production so as to meet the demand.

Sri.P. Guravaiah, Agronomist, Alliance Co. Ltd felt the need for sustainable tobacco production keeping in view of the product integrity challenges that the trade is facing. He has requested for promoting the recommendation "Pendimithaline as suckercide" to non FCV tobaccos also.

Sri.Hari from VST, Guntur identified the need for actual use of bio-fertilizers in Vinukonda burley for obtaining the desired quality.

Sri. D. Ramachandram, ML Co. Ltd. said that crop rotation in NLS and KLS, restricted use of CPAs, judicious use of fertilizers in NLS, production of low nicotine tobaccos are the concerns that needs due consideration from all.

Sri. P. Krishnaiah (Farmer from SBS) indicated that the problem of broomrape has led to poor quality tobacco, consequently low returns to the growers in SBS region. Further he said, tobacco growers are gradually shifting to other crops like bengal gram and chillies in SBS.

Sri.D. Somaiah (Farmer from SLS) specified that there is no price distinction for NTRM free and NTRM tobaccos in the prevailing market and low grades are priced with very low rates which resulted in non-remunerative returns to the tobacco growers. In view of the reduced returns, FCV tobacco growers in SLS are

gradually shifting to red gram and blackgram which are giving the net returns to a tune of Rs. 25,000 -30,000/- per ha.

Sri K. Stayanarayana (Farmer from NBS) said that a cropping sequence consisting pulse or paddy (*kharif*) +maize (*rabi*) +) is the major cropping sequence for which the tobacco farmers shifted. Further, he felt the urgent need to fix rational crop size per barn in FCV tobacco growing areas.

Sri.Y.Sudhakar (Farmer from NLS) identified broomrape menace and price fluctuations as major problems for the tobacco growers in NLS. Further informed that he is a diversified tobacco farmer growing alternative crops in 65% of his holdings which comprises eucalyptus, sugarcane, black gram and maize.

Sri K. Ramesh (Farmer from NLS) appealed to the trade to give quality commensurating price to promote adoption of GAP in real farm situation.

After the stakeholders meeting, Heads of Divisions at CTRI, Rajahmundry and Heads of CTRI Regional Stations presented major thrusts, important activities and salient research achievements of their respective Divisions / Research Stations.

House suggested the following points.

- Use of heterosis for breeding low tar varieties
- Effective utilization of available germplasm to mitigate the problem of broomrape.
- To find out a solution for controlling broomrape before establishes on the post.
- Proposed cropping systems should be in line with the national policy

Presented By	Project Title & Code	Research highlights	IRC recommendation
<b>CROP IMPROVEMENT</b>			
<b>ICAR-CTRI, RAJAHMUNDRY</b>			
<b>Dr. K. Sarala</b>	Evolving superior varieties of FCV tobacco through hybridization - Br-2 a) Evaluation of advanced breeding lines for yield and quality (Earlier MB 9)	RS 23 and RS 27 were found to be promising with 24% and 20% improvement respectively in cured leaf yield over check Siri FCJ 11 and Tobios 6 recorded 27-55% higher cured leaf yields and grade index than the check at CTRI RS, Jeelugumilli.	The proposed activities approved for 2016-17. House suggested to screen resistant materials in hot spot areas
	b) Developing hybrid FCV tobacco suitable for traditional black soil area of Andhra Pradesh(EarlierBr 7 )	Seven CMS hybrids which showed significant standard heterosis for leaf yield traits over the checks, VT 1158 and Siri were identified for further evaluation. New alloplasmic CMS source has been identified. A total of 67 CMS lines with 6 different cytoplasm sources were maintained	
	c) Interspecific hybridization: Incorporation of aphid resistance in <i>N. tabacum</i> from wild <i>Nicotiana</i> species	Twelve lines having promise for leaf yield and quality were identified for replicated trial.	

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	(Earlier Cy-2.1F)	Ten promising lines were contributed to AINPT trials In bulk trial, TBST-2 and TBST 93 were higher yielding than check	
	Molecular Mapping of Important Tobacco Traits (Biotech-6)	Twenty four polymorphic SSR markers were identified for the mapping of nicotine and solanesol traits.  Immortal mapping populations developed for important tobacco traits.	The proposed activities approved for 2016-17.
<b>Dr. AVSR Swamy</b>	Evolving FCV tobacco varieties having high yield and better quality suitable for NLS area of Andhra Pradesh (JL Br-2.1) a) Evaluation of advanced lines	<b>Row trials:</b> A row trial with 90 elite lines was conducted, of which 40 line were selected. Another row trial with 14 ABLs was raised  <b>RYT 17, RYT 18, RYT 19 and RYT 20:</b> Forty three entries were tested in three RYTs and no significant difference was observed among the entries.  In the bulk trial Six entries were assessed and two entries <i>viz.</i> , FCJ 11 and FCJ 7	Approved for continuation of experiments in the ensuing season. Suggested to select few lines having higher productivity and disease resistance.  Since the results were none significant, house suggested selecting very few best lines and constituting fresh RYT and RYT 20 may be vitiated Suggested to do pooled analysis based on pooled analysis decision may be made on further course of action

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		were found to be superior.	House also suggested to go for bulk trial with FCJ 11 and Kanchan
	b) Developing hybrid FCV tobacco suitable for Northern light soils of Andhra Pradesh (Earlier JL Br- 3)	Two CMS hybrids viz., MSH-2 & MSH-6 were found superior to Kanchan, identified for further evaluation.	Suggested to do pooled analysis based on pooled analysis decision may be made on further course of action
	c) Evolving superior varieties of FCV tobacco through hybridization (Earlier Br-2a)	Ten entries each were tested against checks in a replicated trial for the third season. No significant differences were observed among the entries tested.	Approved for continuation of experiments in the ensuing season. House also suggested doing pooled analysis and based on pooled analysis, promising lines may be submitted for testing under AINPT. Lines with disease resistance and higher yield may be advanced for further study.
	Breeding for high seed and oil yield in Tobacco (B-50) a) Developing new varieties of irrigated <i>Natu</i> tobacco for Andhra Pradesh earlier (JLN-2)	<b>Row trials:</b> Six <i>Natu</i> MR lines were tested in row trial along with check of which four were found suitable and will be taken for further testing in ensuing season. NF <sub>4</sub> -13 and NF <sub>4</sub> -1 are found superior with high cured leaf yield against check	Approved for continuation of experiments in the ensuing season. House suggested to select promising two or three lines based on pooled analysis of RYT 2 and decision may be taken based on pooled analysis results and smoke test, bulk trials may be taken up and rest

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		<p>Kommugudem in <i>Natu</i> trial-II NF7-8 and NF7-1 yielded highest total cured leaf yield against check Kommugudem in <i>Natu</i> trial-III</p> <p>NB-4, NB-5, NB-10, NB-12, NB-13, NB-14, NB-18 AND NB-19 were found suitable for further testing and pre release trials.</p>	<p>may be deposited in germplasm collection.</p>
	<p>b) Burley Tobacco (BTRC, Kalavacharla)</p>	<p>Entries were tested in row trials, RYT -1 and bulk trials.</p>	<p>House suggested conducting bulk trial with YB 4, YB 19, YB 22 and Banket AI. Few promising lines may be tested in Vinukonda area and work out fertilizers requirement, topping levels, suckercides and nicotine variability under topping and non topping. Dr. Venkateshwarlu, Head, CTRI RS, Guntur will provide the required logistics to conduct the experiment.</p>
	<p>c) Evaluation for seed and seed oil yield at CTRI RS, Vedasandur</p>	<p>Evaluation of promising selections for seed yield, evaluation in bulk trials and pre release bulk evaluation.</p>	<p>House suggested that the work may be documented and concluded after thoroughly revising the data</p>

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Dr. K. PrabhakaraRao	Molecular characterization and cataloguing of genus <i>Nicotiana</i> using DNA barcoding (Biotech-6, earlier biotech 10)	<p>The loci trnH-psbA (intergenic spacer region) is found to be polymorphic among the <i>Nicotiana</i> accessions with respect to amplicon length and sequence</p> <p>The ycf 1 locus doesn't have any length polymorphism but sequence variation was observed among the accessions at ycf 1 loci and thus can act as barcode loci for differentiating the <i>Nicotiana</i> species.</p>	The experiment will be concluded.
	Biogenesis and regulation of TSNA (Tobacco Specific Nitrosamines) in Tobacco (Biotech-11)	Two high Converters (Banket A1 and YB-4) and two Low Converters genotypes (VA510 and TN90) were selected. All the four genotypes were treated with three different sources of nitrogen. The matured leaves were harvested and cured leaf samples were processed for TSNA analysis. In the pursuit of identifying genes involved	House approved for continuation of the project.



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		in the regulation of TSNA, a total of 45 CYP genes/CYP variants related to TSNA formation were identified from five <i>Nicotiana</i> sequenced genomes.	
<b>ICAR-CTRI RESEARCH STATION, KANDUKUR</b>			
<b>Dr. P VenugopalaRao</b>	Breeding FCV tobacco varieties for yield and quality Characters under SLS conditions (KBr-6)	Fourteen drought tolerant germplasm lines and one wet foot resistant line and six F <sub>1</sub> crosses were raised. Aphid tolerant and Caterpillar resistant F <sub>2</sub> population was raised and evaluated under artificial inoculation and selections were made for further evaluation	House approved for continuation of the project with a suggestion to go for back cross breeding for incorporation of disease resistance and cyclic breeding for incorporation of drought tolerance. Record the yield of SH-1, if it is high yielding than Siri then go for CMS based production. Advanced breeding lines may be obtained from headquarters for evaluation
<b>ICAR-CTRI RESEARCH STATION, HUNSUR</b>			
Dr.C . Nanda	Development and evaluation of F <sub>1</sub> hybrids and advanced breeding lines of FCV tobacco	Two lines viz., FCH 239 and FCH 242 were found to be promising. Hybrid KLSH 10	Approved for continuation of the project with a suggestion to target the yield

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	suitable to Karnataka Light Soil region (BR-19 & 19A)	performed better than the checks in the bulk trial and twenty one new crosses were synthesized	improvement, especially through hybrids. Suggested to communicate the technical programme to the headquarters in advance to obtain formal approval as the season begins before IRC. Project title and objectives of the project may be suitably modified to cover the work carried out and communicated for information to PME cell. Also suggested for collect information on the basis on which KLSH-10 was promoted to AVT-1 from IVT, substantiate with data otherwise use it in hybrid trial.
<b>CROP PRODUCTION</b>			
<b>ICAR-CTRI, RAJAHMUNDRY</b>			
<b>Dr. S. Kasturi Krishna</b>	Chemical management of <i>Orobanche</i> in FCV tobacco (A-83)	<ul style="list-style-type: none"> <li>• Lower <i>Orobanche</i> weight and % infestation was observed when PEA of Glyphosate was given at 50 and 70 days to tobacco</li> </ul>	To test the <i>penicilliumoxalicum</i> in the lab for germination inhibition of <i>orobanche</i> seed and observe the mode of action.

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		<p>and was on par with Neem cake application to tobacco +PEA of Neem oil to <i>Orobanche</i> and Neemcake application to tobacco + PEA of Glyphosate at 50 days to tobacco in Vertisols.</p> <ul style="list-style-type: none"> <li>• In alfisols PPI of Alachlor+ growing green gram between tobacco plants and PPI of Pendimethalin+ growing green gram between tobacco plants recorded significantly lower <i>Orabancheweight</i> followed by Neemcake application to tobacco +PEA of Neem oil to <i>Orobabanche</i>, and PEA of Glyphosate at 50 and 70 DAP</li> </ul>	<p>The cultural methods like germination inducing factors and catch crops may be tried in the experimentation.</p> <p>The house suggested continuing the project in 2016-17 with suggested modifications.</p>
<b>Dr. S. V. Krishna Reddy</b>	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)	<ul style="list-style-type: none"> <li>• The higher yield in FYM + balanced NPK plot and in regular inter-culture with complete weeding is due to higher SLW, moderate LAI &amp; LWR. The absence of false maturity in these</li> </ul>	To validate the observations and confirming the results in larger field plots both in Vertisols and Alfisols

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		<p>plots are supported by higher chlorophyll content in Vertisols.</p> <ul style="list-style-type: none"> <li>• Under irrigated Alfisols application of FYM + balanced NPK (recommended) and FYM + (125 % N) and recommended PK plots performed better and recorded higher GLY, CLY, GI, GI/CL(%) and also recorded higher chlorophyll and nicotine content and did not express false maturity symptoms compared to balanced NPK (recd.) and (excess N) recd.PK plots.</li> </ul>	
<b>Dr. S. Kasturi Krishna</b>	Leaf biomass and seed yield improvement in advanced breeding lines for alternative uses (A-85)	<ul style="list-style-type: none"> <li>• HDBRG with 60 x 40 spacing and 150:75:75 NPK kg/ha recorded higher leaf yields of</li> <li>• .05 q/ha followed by 60 x 40 spacing and 100:50:50 NPK kg/ha with a yield of 370.64 q/ha.</li> <li>• Line RT 51-1 followed by</li> </ul>	The project will be concluded. It was suggested to submit RPF III.

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		TI-163 x A-145 line recorded higher nicotine yields with 80 x40 spacing and 150:75:75 NPK kg/ha. • HDBRG followed by TI-163 x A-145 with a spacing of 70 x40 and 150:75:75 NPK kg/ha gave higher solanesol and protein yield.	
<b>BTRC, KALAVACHARLA</b>			
<b>Dr.C.ChandraSekharaRao</b>	Evaluation of set row planting in burley tobacco for efficient resource conservation and utilization (AB-30)	<ul style="list-style-type: none"> <li>• Set row planting with 100% RDF showed significantly higher cured leaf yield</li> <li>• SRP with 100% RDF showed significantly higher soil available P and K content compared to conventional planting.</li> </ul>	Project concluded. RPF III will be submitted
<b>ICAR-CTRI RESEARCH STATION, JEELUGUMILLI</b>			
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"> <li>• The bulk plot was grown with tray seedlings, and drip fertigation at 3<sup>rd</sup>, 20-25 and 40-45 DAP in comparison to normal seedlings, furrow</li> </ul>	Project concluded. RPF III will be submitted

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		<p>irrigation and soil application of fertilizers.</p> <ul style="list-style-type: none"> <li>• Tray seedlings with drip fertigation and drip irrigation recorded increased cured leaf yield by 415 kg (16.47%) and grade index by 425 (23.5%) when compared with normal seedlings furrow irrigation and soil application of fertilizers.</li> <li>• Different sources of nitrogen (urea/Ammonium sulphate) as basal dose and their combinations (AS/urea/urea+AS/ urea +AS+KNO<sub>3</sub>/urea+AS+CN) as top dressing did not influence the yield parameters, quality parameters and also nutrient composition of FCV tobacco in northern light soils of Andhra Pradesh.</li> </ul>	

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<b>ICAR-CTRI RESEARCH STATION, HUNSUR</b>			
Dr. M. Mahadevaswamy	Feasibility of producing organic tobacco in KLS (A-38)	<ul style="list-style-type: none"> <li>The productivity gap between organic and inorganic bridged to 25.9% during 5<sup>th</sup> crop season of the study</li> <li>Marked reduction in cured leaf nicotine was observed with effective control of soil borne disease (wilt and RKI) in the organic plots</li> </ul>	<p>The project will be concluded and RPF III will be submitted.</p> <p>The demo plot on organic tobacco production to be maintained as a bulk plot trials.</p>
	Potassium nutrition management strategies for productivity and quality enhancement of FCV tobacco grown under rainfed environment in KLS (A-40) <b>(The project is merged with SS-31)</b>	<ul style="list-style-type: none"> <li>Application of 120kg K<sub>2</sub>O/ha in 4 splits (10, 25, 40 and 55 DAT) improved the productivity by 10.6% and enhanced the top grade leaf production by 15.0% indicating the usefulness of more no. of split applications of potassium in rainfed conditions of KLS.</li> </ul>	The third crop season replicated trail will be conducted during 2016-17 season.
	Studies on climate risk management in FCV tobacco based cropping systems in STZ of Karnataka (A-41)	<ul style="list-style-type: none"> <li>The critical stage of moisture for FCV tobacco in KLS coincided with July rainfall</li> <li>The leaf nicotine and</li> </ul>	<ul style="list-style-type: none"> <li>The feeler trail on <i>Rabi</i> crop of FCV tobacco to be taken up as early as possible.</li> <li>The <i>ratoon</i> crop may be raised in bulk plots for seed</li> </ul>

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		<p>chlorides tend to decrease with increase in quantum of July RF while the reducing sugars showed increasing trend.</p> <ul style="list-style-type: none"> <li>• The very low or high RF in excess (&gt;120 mm) tends to adversely affect the productivity</li> <li>• The increased density of planting at 90 x 45 cm showed promising trend in the dry/semi dry zone of KLS compared to normal spacing of 100 x 55 cm</li> </ul>	<p>production purpose.</p> <ul style="list-style-type: none"> <li>• High density planting and drought management experiments are to be continued during 2016-17</li> </ul>
	<p>Evaluating alternative nutrient sources to provide balanced nutrition for flue cured tobacco grown in KLS region (A-42)</p>	<ul style="list-style-type: none"> <li>• Various alternative nutrient sources tried did not show any significant differences with respect to yield or quality of FCV tobacco in different zones of KLS.</li> <li>• Calcium nitrate and Potassium nitrate as N and K source were comparatively better.</li> <li>• The trails are being conducted in 6 farmers'</li> </ul>	<p>The alternative sources of nutrients with existing treatments to be continued during 2016-17</p> <p>The new technical programme on "Evaluation of granulated fertilizers as an alternative source of nutrient fertilizers of FCV tobacco in KLS" needs proper approval from the competent authority and as</p>



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		field locations of dry, semi dry and wet zone of KLS	such to be disassociated.
<b>ICAR-CTRI RESEARCH STATION, VEDASANDUR</b>			
<b>Dr. M. Kumaresan</b>	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"> <li>• Annual moringa inter cropping did not affect the yield of chewing tobacco.</li> <li>• Recommended fertilizers at 125% to chewing tobacco and annual moringa increased the TEY and net returns.</li> </ul>	The project is to be concluded with farming community recommendations.
<b>ICAR-CTRI RESEARCH STATION, DINHATA</b>			
S. Mandi	Permanent manurial trial on <i>Motihari</i> tobacco (A-10)	<ul style="list-style-type: none"> <li>• Application of nitrogen along with potassium and phosphate recorded higher productivity and was economically profitable</li> <li>• Among the organic manures 50 t FYM recorded higher green, cured and first grade leaf yield</li> </ul>	The R <sup>2</sup> values for different parameters in the presentation may be checked by analyzing the data again. It was suggested to try ratoon technology in small experiment as a feeler trail and pest and diseases needs to be monitored in the crop

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<b>AGRICULTURAL EXTENSION</b>			
Dr. Y. Subbaiah	<b>Technology Evaluation, demonstration and impact Analysis</b> (Ag. Extension-50)	<ul style="list-style-type: none"> <li>• Significantly superior cured leaf yield was recorded in Tobios-6 over check, Kanchan and farmers preferred Tobios-6 over Kanchan due to its desired characteristics and high yielding potential.</li> <li>• Adoption of technologies (Tray seedlings, NPK fertilization, integrated weed management and application of need based pesticides) in NLS area improved the farmer's income.</li> <li>• In SBS, adoption of in-situ green manuring, NPK fertilization, inter cultures, judicious topping and application of need based pesticides improved the farmers income</li> </ul>	The project will be continued with other technologies of identified tobacco types for itsevaluation, d emonstration and impact analysis
Dr. K. SumanKalyani	Nutritional Security in Tribal Areas of East Godavari District Through Community Based Approaches(DBT)	Dr.SumanKalyani presented the results emanated from the concluded DBT project	-----

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<b>AKMU</b>			
<b>Dr. H. Ravisankar</b>	Tobacco Agridaksh : An online expert system (ARIS-15).	<ul style="list-style-type: none"> <li>• It is a single platform where the expert systems for all crops are accessible from a server located in IASRI, New Delhi.</li> <li>• Two modules viz., KBS for tobacco insect-pests and tobacco varieties has been developed and linked to Agridaksh server located in IASRI.</li> <li>• The modules on tobacco varieties and insect pests were developed and linked to Agridaksh which provides global accessing of the information on various components related to insect pests and varieties.</li> </ul>	The project will be continued during the season 2016-17.
<b>CROP PROTECTION</b>			
<b>ICAR-CTRI, RAJAHMUNDRY</b>			
Dr. U. Sreedhar	Bio-efficacy and field evaluation of new pesticides against tobacco pests (E-81)	<ul style="list-style-type: none"> <li>• Novaluron 5.25 % + Emamectin benzoate 0.9 SC @ 0.012% &amp; 0.009 was found promising against</li> </ul>	The title of the project E.81 to be modified as “Integrated management of insect pests & diseases in tobacco” in view of

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	Evaluation of new insecticides against <i>Spodopteralitura</i> Fabricius in tobacco nurseries.	<i>S.litura</i> in tobacco nurseries.	merger of 5 projects with different objectives. The new experiment on “Validation of integrated management modules for sucking pests in FCV tobacco” under the ongoing project E 81 was approved and house suggested conducting the experiment in two locations of NLS.
	Persistent toxicity of chlorfluazuron 5.4 EC against <i>Spodopteralitura</i> Fabricius on tobacco	<ul style="list-style-type: none"> <li>• Persistent toxicity studies against <i>S.litura</i> on tobacco showed that chlorfluazuron 5.4 % EC @ 0.03% recorded 100 per cent mortality up to 6 DAS with a mean period of persistency of 12 days, mean persistent toxicity (PT) of 66.66 and a mean persistent toxicity index (PTI) of 799.62.</li> </ul>	
	Field efficacy of new insecticides against tobacco budworm, <i>Helicoverpaarmigera</i> Hubner on FCV tobacco	<ul style="list-style-type: none"> <li>• Chlorantranaliprole 25 SC @ 0.0075%, spinosad 45 SC @ 0.018%, flubendiamide 480 SC @ 0.012% were found to be highly promising against budworm in FCV tobacco.</li> </ul>	

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	Management of ground beetle, <i>Mesomorphusvilliger</i> Blanch in FCV tobacco	<ul style="list-style-type: none"> <li>• Bulk trial on management of ground beetle revealed that the least seedling damage (1.51, 2.06 &amp; 2.47%) was observed in seedling root dip in imidacloprid 70 AF @ 0.14% followed by planting of tray seedlings treated with imidacloprid 200 SL @ 0.005% (1.92, 2.19 &amp; 3.15) and transplant water treatment with imidacloprid 200 SL @ 0.005%(2.06, 4.97 &amp; 5.21%) as against 19.23, 24.03 &amp; 24.72 in untreated plot at 7, 15 &amp; 21 DAP respectively.</li> </ul>	
	Management of tobacco whitefly, <i>Bemisiatabaci</i> Gennadius a vector of tobacco leaf curl virus disease	<ul style="list-style-type: none"> <li>• Integration of barrier crop and three sprays of insecticides could protect FCV tobacco from leaf curl virus disease transmitted by whitefly as shown by less whitefly population as well as leaf curl infected plants.</li> </ul>	
	Management of <i>Helicoverpaarmigera</i> Hubner in tobacco as oil seed crop	<ul style="list-style-type: none"> <li>• For management of capsule borer, <i>H.armigera</i> in seed crop, the chemical</li> </ul>	

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		control module consisting of three sprays 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 and capsule formation, and need based spray of insecticides).	
	Monitoring and management of insecticide resistance in tobacco caterpillar, <i>Spodopteralitura</i> Fabricius	<ul style="list-style-type: none"> <li>• Studies on base line resistance of <i>S.litura</i> on tobacco showed low LC 50 values for spinosad (0.0019 mg/ml) and chlorantraniliprole (0.0039 mg/ml).</li> <li>•</li> </ul>	
Dr. S.K. Dam	Compatibility of recommended fungicides and insecticides against <i>Cercosporanicotianae</i> Ellis & Evereh	<ul style="list-style-type: none"> <li>• All the recommended fungicides against <i>Cercosporanicotianae</i> were found compatible with insecticides, emamectin benzoate, flubendiamide and imidacloprid at their</li> </ul>	The house suggested continuing the feeler trial for one more year and to present the combined results of two years. He was also asked to identify the black shank endemic areas and implement the effective treatment

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		respective recommended doses.	(Fenomidon + Mancozeb) in those sick areas.
	Evaluation of promising fungicides against leaf blight disease, <i>Phytophthora parasitica</i> f. sp. <i>nicotianae</i> (Breda de Haan) Tucker in the nursery	<ul style="list-style-type: none"> <li>Application of fenamidone + mancozeb 60WG @ 0.3% was found highly promising for the management of leaf blight disease in tobacco nurseries.</li> </ul>	
	Feeler trial: Efficacy of new fungicides for the management of black shank disease in main field caused by <i>Phytophthora parasitica</i> f. sp. <i>nicotianae</i> (Breda de Haan) Tucker	<ul style="list-style-type: none"> <li>Application of fenamidone + mancozeb 60 WG @ 0.3% is a promising alternative to metalaxyl + mancozeb 68% WP @ 0.2% for the management of black shank disease in FCV tobacco.</li> </ul>	
ICAR-CTRI RESEARCH STATION, JEELUGUMILLI			
Dr. G. RaghupathiRao	<p>Evaluation of insecticide application technology for effective spray coverage on FCV tobacco in NLS (E-82)</p> <p>Evaluation of insecticide application technology for effective spray coverage on FCV</p>	<ul style="list-style-type: none"> <li>Battery operated sprayers were characterised by extremely higher nozzle</li> </ul>	Under this project, one experiment conducted at Jeelugumilli was concluded and two experiments will continue at CTRI, Rajahmundry. Use of stickers along with pesticides was suggested for uniform coverage and retention of the pesticide on the leaves. House

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	tobacco in NLS	discharge rate of 1400-2250 ml/min through different nozzles and showed good performance for 4-5 hours. Studies revealed superiority of Hi tech sprayer with nozzle discharge rate of 550 ml/min at 40 PSI over battery operated sprayers as shown by spray characteristics and effective management of insect pest infestation.	also suggested preparing a pamphlet on the usage of new sprayers in tobacco.
	Influence of varied nozzle discharge rate on spray fluid requirement, spray characters and insect pest infestation on tobacco	<ul style="list-style-type: none"> <li>Studies on influence of varied nozzle discharge rates on spray fluid requirement, spray characters and insect pest infestation on tobacco indicated that Hi tech sprayer with nozzle discharge rate of 550 ml/min was superior over 650 - 1200 ml//min. in providing uniform coverage and effective</li> </ul>	



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		<p>management of insect pest infestation. Nozzles with higher discharge rates (beyond 550 ml/min) resulted in poor spray spectrum due to run off from leaf surface and wastage of insecticide.</p>	
ICAR-CTRI RESEARCH STATION, KANDUKUR			
Dr. K.C. Chenchiah	Evaluation of IPM modules for management of caterpillar and aphid in FCV tobacco under SLS conditions (EK.19)	<ul style="list-style-type: none"> <li>• All the yield parameters differ significantly in showing the differences of the treatments.</li> <li>• The IPM Module gave highest green leaf, cured leaf, bright leaf and grade index.</li> <li>• The cured leaf yield in this IPM module is 1811 kg/ha, which is 33.18% higher than control.</li> <li>• The cost benefit ratio was 1: 1.3836 for IPM module.</li> </ul>	He was asked to check the research data, analyze it properly and re-submit the data along with salient findings to RMC/PME cell. The house suggested studying population dynamics of insect pests under SLS.

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<b>ICAR-CTRI RESEARCH STATION, GUNTUR</b>			
Dr. P. Venkateswarlu	Validation of IPM module against tobacco aphid, <i>Myzusnicotianae</i> under CBS conditions (EG-14)	<ul style="list-style-type: none"> <li>• The bio-intensive IPM module with two rows of maize border as barrier crop, one spray of <i>Verticilliumlecanii</i>@ 3X10<sup>12</sup> CFU/ha at 50 DAP and one spray of imidacloprid @ 50g a.i./ha at 60 DAP exhibited 94.87% reduction of infestation by tobacco aphid and 4.63% increase of cured leaf yields over untreated control.</li> <li>• Farmers practice consisting of two recommended pesticides viz., imidacloprid 0.03% and thiomethaxam 0.02% applied at 50 and 60 days of planting, respectively reduced aphid infestation by 100% and increased yields by 5.36%over untreated control.</li> </ul>	The project E.14 was concluded. It was suggested to verify the quality of the bio-agents used in the field under laboratory in view of quality issues. House suggested to workout cost benefit ratios for concluded project and present the results in RPF-3.
	Survey for assessment of insect pest incidence in tobacco and tobacco based cropping systems	<ul style="list-style-type: none"> <li>• A survey covering major tobacco growing areas of SBS during 2015-16</li> </ul>	The project was concluded and house suggested giving RPF-3.

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	of CBS and SBS (EG-15)	revealed that leaf curl caused by whitefly, <i>Bemeciatabaci</i> and caterpillar, <i>Spodopteralitur a</i> were the main pests in planted crop and nursery with 9.5 and 3.54% infestations, respectively.	
<b>ICAR-CTRI RESEARCH STATION, HUNSUR</b>			
Dr. S. Ramakrishnan	<p>Integrated management of root knot nematodes in FCV tobacco (N-20)</p> <p>Evaluation of bio-agents enriched tray seedlings against Root Knot Nematode-<i>Fusarium</i> wilt disease complex in FCV tobacco field crop</p>	<ul style="list-style-type: none"> <li>Results revealed that, <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 7.8, 9.3 and 10.4 per cent</li> </ul>	The house suggested not to take up the newly proposed experiment under the new project but advised to take observations on nematode populations in the tobacco grown with sun hemp and without sun hemp. The trial has to be conducted in endemic/hot spot areas of farmer's fields. House also suggested that screening of germplasm for reaction to root knot nematodes should be conducted continuously for 5 years with the same set of lines. Lines should not be changed every year. The

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		<p>respectively over check.</p> <ul style="list-style-type: none"> <li>• These effective treatments also decreased the root knot index by 45.0, 45.4 and 50.0 per cent respectively and decreased the wilt disease incidence by 52.5, 52.3 and 50.0 per cent respectively over check.</li> </ul>	<p>naturally identified resistant lines should be subjected for artificial inoculation of nematodes and finally identify the true resistant lines and final documentation. The house also asked to submit RPF-3 for the concluded project, N.20.</p>
	<p>Screening of tobacco germplasm against root-knot Nematodes</p>	<ul style="list-style-type: none"> <li>• The lines RKR 2, RKR 6, RKR 7, RKR 10, RKR 12 and RKR 13 were found promising against root knot nematode with RKI <math>\leq</math> 1.0.</li> <li>• The lines FCH 240, FCH 243 and FCH 244 with RKI <math>\leq</math> 2.0 will be further tested, since they recorded comparatively lesser RKI.</li> </ul>	

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<b>CROP CHEMISTRY &amp; SOIL SCIENCE</b>			
<b>ICAR-CTRI, RAJAHMUNDRY</b>			
Dr. D. Damodar Reddy,	Evaluation of Crop Residue and Wood Ashes - Effects on Soil Fertility and Potassium Nutrition of Tobacco (SS-31)	<ul style="list-style-type: none"> <li>• Crop residue/wood ashes applied either alone or in combination with SOP (50% + 50%) on 100 kg K ha<sup>-1</sup> equivalent basis exhibited the potential to significantly increase tobacco cured leaf yield and K uptake without adversely affecting leaf quality. It led to enhanced use efficiency of applied K. Improved pH levels with the application of biomass ashes indicating the liming effect of ashes.</li> <li>• These results imply that the biomass ashes can serve as potential sources for K supplementation for FC tobacco on light textured Alfisols under KLS and NLS regions.</li> <li>• Application of 120 kg K<sub>2</sub>O/ha in 4 splits(10, 25,</li> </ul>	<p>Results of merged project A-40 were presented along with this project results.</p> <p>Approved to continue in 2016-17 season.</p>

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		<p>40 and 55 DAT) recorded the maximum cured leaf yield and top grade equivalent yields and was significantly superior to single split application as basal dose.</p>	
Ms. J. PoornaBindu	<p>Evaluation of organic and inorganic soil amendments to minimize nutrient leaching losses and enhance nutrient use efficiency under NLS tobacco production system (SS-32)</p>	<ul style="list-style-type: none"> <li>• Application of tobacco stalk biochar (TSB) inhibited the leaching losses of ammonium and potassium by 28.10 and 25.28 per cent, respectively.</li> <li>• The increment in soil pH differed between different soil amendments and followed order: T<sub>6</sub> (1 t ha<sup>-1</sup> TSB+250 kg ha<sup>-1</sup> SZ)&gt; T<sub>7</sub> (1 t ha<sup>-1</sup> TSB)&gt; T<sub>4</sub> (100 % RDF+1 t ha<sup>-1</sup> TSB+250 kg ha<sup>-1</sup> SZ)&gt; T<sub>3</sub> (100 % RDF+250 kg ha<sup>-1</sup> SZ)&gt; T<sub>2</sub> (100 % RDF+1 t ha<sup>-1</sup> TSB)&gt; T<sub>5</sub> (100 % RDF +0.5 t ha<sup>-1</sup> TSP).</li> <li>• Application of TSB with 100% RDF and TSB+SZ+100% RDF</li> </ul>	<p>House suggested including studies on microbial and enzyme activity in relation to soil amendments.</p> <p>Approved to continue in 2016-17 season</p>

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		<p>caused a significant increase in GLY and CLY compared to the 100% RDF. Application of TSB along with 100 % RDF has significantly improved the N and K uptake with the recovery efficiency of 46.1 and 66.9 per cent, respectively compared to 100 % RDF.</p>	
Dr. L.K.Prasad	Assessment of leaf quality of FCV tobacco using hyperspectral remote sensing and growth parameters (SSK-2)	<ul style="list-style-type: none"> <li>• Models were developed for non destructive estimation using hyperspectral reflectance data for physiological and quality parameters.</li> <li>• A model was developed for nicotine in leaf at different positions (<math>R^2</math> values = 0.974 - 0.980).</li> <li>• New spectral vegetation indices were developed for retrieving some of the bio physical parameters in FCV tobacco.</li> </ul>	Approved to continue in 2016-17 season.
Dr.D.V. Subhashini	Tobacco ( <i>Nicotianatabacum</i> L.) leaf assisted green synthesis of	<ul style="list-style-type: none"> <li>• XRD patterns were analyzed to determine</li> </ul>	House approved to work on microbial activity in relation

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	silver nanoparticles and evaluation of its antimicrobial activity against agricultural plant pathogens ( SSMB-12)	<p>peak intensity, position and width of synthesised tobacco nano particles. XRD diffraction peaks correspond to the characteristic face centered cubic silver lines.</p> <ul style="list-style-type: none"> <li>• Antibacterial characterization of silver nanoparticles (as low as 60 µg/ml) showed a complete cytotoxicity of bacterial strains <i>E. Coli</i>, <i>Staphylococcus aureus</i>, <i>Salmonella abactetuba</i>, and <i>Pseudomonas aeruginosa</i> on both liquid as well as solid growth media.</li> <li>• In the <i>in vitro</i> experiment, mycelia growth inhibition was 100 % at all tested concentrations of nano particles in case of most sensitive fungus <i>Pythiumaphanidermatum</i>.</li> </ul>	<p>to on-going experiment on long term fertilizer experimentation.</p> <p>Approved to continue in 2016-17 season.</p>
	Characterization, value addition and utilization of tobacco seed oil and its by- products	<ul style="list-style-type: none"> <li>• Tobacco seed oil is free from TSNA and heavy metals, Aflotoxins are</li> </ul>	<p>Approved to continue in</p>



Presented By	Project Title & Code	Research highlights	IRC recommendation
	<b>(External funded project)</b>	below the recommended level and proximate analysis of tobacco seed of different types completed.	2016-17 season.
<b>ICAR-CTRI RESEARCH STATION, KANDUKUR</b>			
Dr. M. Anuradha	Abiotic stress management interventions for climate resilient flue cured tobacco production in SLS Domain of A.P. (PHYK-1).	<ul style="list-style-type: none"> <li>• Among the new soil amendments tested performance of hydrogel and biochar is better compared to zeolite.</li> <li>• Increase in plant population by 100% and N and K fertilizer by 50% enhanced the cured leaf yield by 45.6%.</li> <li>• Productivity of flue-cured tobacco decreased as the planting date advanced from October 3<sup>rd</sup> week onwards.</li> </ul>	Experiment on dates of planting, treatment with ripening agent was proposed to drop by the PI and house agreed & approved to continue in 2016-17 season.
<b>BTRC, KALAVACHARLA</b>			
Dr.C. Chandrasekhar Rao	Evaluation of set row planting in burley tobacco for efficient resource conservation and utilization (AB-30).	<ul style="list-style-type: none"> <li>• SRP 100% RDF showed significantly higher cured leaf yields over others treatments. SRP with 50% RDF and CP with 100% RDF being at par showed</li> </ul>	Project completed and RPF III will be submitted.

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		<p>significantly higher cured leaf yield over SRP with 25% RDF and SRP with no fertilisers</p> <ul style="list-style-type: none"> <li>• Nicotine content in conventional planting was lower than SRP with different fertiliser doses. Variable fertiliser doses in SRP being at par showed significantly higher Reducing sugars over CP with 100% RDF.</li> <li>• Set row planting with 100% RDF showed significantly higher soil available P and K compared to conventional planting. Soil dehydrogenase activity was high in SRP 100% RDF and 75% RDF compared to conventional planting.</li> </ul>	

### New projects presented and approved.

S.No	Title of the project	Investigator	Remarks
1.	Integrated weed management in chewing tobacco	Dr. M. Kumaresan	The house suggested to study the weed flora and approved for conducting the trail.
2.	Integrated management of insect pests of FCV tobacco in southern black soils of A.P. (EG.16).	Dr. P. Venkateswarlu	The project was discussed thoroughly and the house suggested finalizing the treatments in consultation with the Head, Crop Protection and putting the proposal in RPF-1. House also suggested including jowar border in place of maize border in the treatments. The project duration will be 2 years i.e. up to 2017-18. The house suggested to study the population dynamics of insect pests. The project was approved.
3.	Energy management strategies for curing FCV tobacco	Dr. C. ChandrasekharaRao	The house suggested dropping the sixth objective: <i>Evaluation of different tree species for fuel wood</i> and to reduce the objectives to 3-4 accordingly by merging required activities. The chairman suggested including CTRI RS, Hunsur also in the project as the KLS crop is in <i>Kharif</i> monsoon. The house also suggested using only high calorific value biomass for making of briquettes. The chairman suggested to study on minor

S.No	Title of the project	Investigator	Remarks
			<p>modifications in the barns and further suggested to work more in the line of dual fuel system with more emphasis on use of solar energy.</p> <p>The project was approved by the house with above the recommendations.</p>
4.	<p>Evaluation of soil fertility and development of online nutrient recommendation system for FCV Tobacco</p>	Dr. L.K.Prasad	<p>The chairman suggested developing coefficients for computing STCR equation based fertilizer recommendation and take into consideration the average yield potentials of the crop in the study area.</p> <p>The project was approved by the house.</p>