

**Proceedings of the Third Consortium Advisory Committee (CAC) meeting for the Sub-Project  
“Research into Development of Decision Support Systems for Management of Insect Pests of Major  
Rice and Cotton Based Cropping Systems” (C2046) under NAIP Component 4 held on**

**20<sup>th</sup> May 2011 at CRIDA, Hyderabad**

The third CAC meeting of the sub-project was held at CRIDA, Hyderabad under the chairmanship of Dr TM Manjunath, Chairman, CAC on 20<sup>th</sup> May 2011. The following CAC members of the sub-project attended the meeting:

1	Dr T.M. Manjunath	Chairman
2	Dr S. Lingappa	Member
3	Dr N.H. Rao	Member
4	Dr B. Venkateswarlu, Director, CRIDA	Member
5	Dr Y.G. Prasad, CPI, CRIDA	Member Secretary

National Coordinator could not attend the meeting. All the CCPIs and Co-PIs were co-opted to participate in the meeting. The Action taken report on 2<sup>nd</sup> CAC was tabled and discussed. The following presentations were made before the CAC and discussed:

Sl.No.	Presentations	CPI/CCPI/Co-PI
1.	Cotton based cropping systems	Dr VS Nagrare, CCPI, CICR
2.	Progress at CRIDA, Hyderabad	Dr M Prabhakar, Co-PI, CRIDA
3.	Progress at NCIPM, New Delhi	Dr S Vennila, CCPI, NCIPM
4.	Progress at SAC, Ahmedabad	Dr Sujay dutta, CCPI, SAC
5.	Rice based cropping systems	Dr G Katti, CCPI, DRR
6.	Progress overview and gaps identified	Dr YG Prasad, CPI, CRIDA

The following comments/suggestions and recommendations emerged:

- Publish the information generated on YSB larval incidence vs. tiller damage, extent of dispersal and mortality. Forecast of egg parasitoid activity vis-à-vis crop age, parasitoid species and egg hatchability is also important (Action: Co-PI, DRR, Hyderabad)
- With regard to the reported occurrence of white stem borer at Ludhiana, it is recommended that immature stages and adult moths (atleast 20 numbers ) be preserved for taxonomic identification and to serve as voucher specimens. It is better to preserve all stem borer species for future reference (Action: Co-PI, PAU, Ludhiana)
- Publish the information generated on lifecycle parameters of Brown plant hopper and White backed plant hopper. Confirm the longer development duration at higher temperatures and compare the present work with earlier work carried out at TNAU. The finding that *Echinocloa*

can act as an alternate host for WBPH is noteworthy. Also the fact that there are no alternate hosts for BPH is also important. (Action: Co-PI, DRR, Hyderabad)

- Field studies on BPH at Mohanpur to take note of planting delays. Life table parameters need to be confirmed with more reliable data in *Kharif* 2011. (Action: Co-PI, Mohanpur)
- Preserve leaf folder moths collected from different hosts including rice and send for identification. The high moth emergence and the issues of migration/dispersal/reproductive diapause may be investigated critically. Identify the parasitoids of leaf miner to species level. (Action: Co-PI, DRR, Hyderabad)
- Continue studies on field growth rates of BPH at Maruteru and construct field life tables. Define the critical weather parameters and crop factors that trigger outbreak of BPH in a short period. (Action: Co-PI, Maruteru)
- Undertake taxonomic identification of coccinellids and spiders preying on cotton mirid bugs. (Action: Co-PI, CICR-RS, Coimbatore)
- Bring out clearly the status of mirid bug species on cotton in the central zone and southern zones. It is most likely that mirid bugs are found both in non-Bt and Bt-cotton fields, not exclusive to Bt-cotton. The experiments on crop adjacency are mostly related to the local cropping pattern rather than the cropping system. This may be taken into account while reporting. (Action: CCPI, Nagpur/Co-PI, CICR-RS, Coimbatore)
- There should be uniformity in adoption of severity index/grade/ level etc across the centres. (Action: CCPI, Nagpur)
- Each project scientist should scrutinize the data generated repeatedly so as to interpret and draw meaningful inferences. This will ensure greater clarity in presenting it in simple and easily understandable manner (Action: All project scientists)
- Compare actual life tables with those of their visualized counterparts (i.e., hypothetically constructed life tables) without any impact by stage-specific mortalities. The idea is to highlight the potential population growth rates if such mortality factors did not exist. In other words, this comparison helps us to appreciate the role played by such mortality factors in checking the pest population. (Action: CCPIs)
- A status paper referring to all kinds of approaches / methodologies that have been adopted globally for modeling of pests and development of DSS may be brought out.

The following topics have been identified for project scientists:

S.No.	Topic	Responsibility
1.	Generic approaches for pest modeling – a concise global review	Dr Y.G. Prasad & Dr S. Vennila
2.	Generic approaches for DSS- a concise global review	Dr S. Vennila & Dr Y.G. Prasad
3.	Towards modeling and DSS for pests in Rice and cotton based cropping systems	
	<ul style="list-style-type: none"> <li>• Cotton Mealybugs - Phenacoccus</li> <li>- Paracoccus</li> </ul>	Dr V.S. Nagrare & Dr Rishi kumar Dr B. Dharajothi
	<ul style="list-style-type: none"> <li>• Cotton Mirid bugs</li> </ul>	Dr V.S. Nagrare & Dr B. Dharajothi

	• Rice YSB	Dr G. Katti, Dr A.P. Padmakumari, Dr Mayabini Jena & Dr P.Sarao
	• Rice BPH/WBPH	Dr V. Jhansilakshmi & Dr C.R. Satpathy
	• Rice leaf folder	Dr Ch. Padmavathi
4.	Application of space borne remote sensing in forecasting and crop damage assessment due to pests and diseases	Dr Sujay dutta & Dr M. Prabhakar
5.	Application of Hyperspectral radiometry for detection of crop stress due to pest and diseases	Dr M. Prabhakar
6.	ITKs in pest forecasting	Dr K. Nagasree & YG Prasad
Targets for completion: First draft by 31 <sup>st</sup> July 2011; Revised MS by 31 <sup>st</sup> August 2011; Published by 30th September 2011		

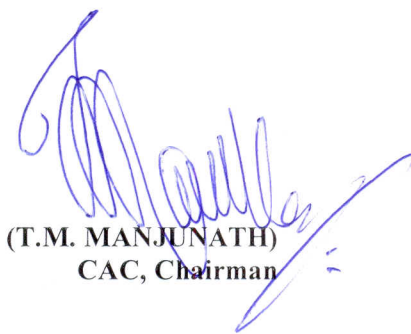
- A wealth of information has been generated in the project. The collected data needs to be scrutinized carefully for identifying useful data for development of prediction models with minimum number of variables.
- It is important to have clarity on whether the decision support contemplated is at the farm level or at the strategic level. Farm level or tactical decision support should facilitate advisories that are useful for pro-active or curative interventions. This can take advantage of the advances in communication like 3G etc. Strategic level decision support at the macro level can come from remote sensing applications like damage assessments which are good for trade, industry and government initiatives. Parameters for identifying the problem at an early stage would be advantageous.
- While developing tactical decision support tools, attention may be given to the lead times for prediction so that the end user has sufficient time for preparation and carrying out the intervention. Proper data collection formats used in this project from the inception has certainly helped to overcome the lack of commonality in data sets generally seen in historical data sets.
- Chairman, CAC and members complemented all the consortium partners for carrying out the envisaged technical programme and generating valuable data. In the remaining period of the project, scientists need to focus on gaps in data requirements highlighted by the CPI.
- All the project scientists are urged to bring out popular scientific articles on the work carried out by them apart from publishing their work in rate journals
- The consolidated project report should be finalized by the end of December 2011. Accordingly the *Kharif*, 2011 experimental results should be compiled and analyzed.
- The CAC also felt that the encouraging data obtained so far with the project should be taken to a logical end and more time beyond the present tenure is required for this purpose. Therefore, the CAC recommends that a proposal for extension of the sub-project for 2 years till 2014 may be prepared and submitted in the prescribed format to PIU-NAIP for consideration. This extended

period should be utilized for validation and refinement of the models and DSS and come out with useful and tested products. Nano-sensors for early detection of pests and automatic alerts for impending attacks can also be thought of.

- The committee reiterated its appreciation for the multi-directional efforts being made by the consortium partners. However, it felt that the work on pest modeling and decision support systems is highly complex and an international opportunity for exchange of views and experience would enhance expertise. In view of this, the CAC recommends the proposal for international training of 5 project scientists: four CCPs of DRR, CICR, SAC, NCIPM and one CPI, CRIDA, either in the remaining period of the project or in the extended period as recommended above



(YG Prasad)  
CPI & Member Secretary, CAC



(T.M. MANJUNATH)  
CAC, Chairman

**List of Participants**

1. TM Manjunath, Chairman, CAC
2. S Lingappa, Member, CAC
3. NH Rao, Member, CAC
4. B Venkateswarlu, Director, CRIDA, Hyderabad
5. YG Prasad, CPI, CRIDA, Hyderabad
6. M Prabhakar, Co-PI, CRIDA, Hyderabad
7. BMK Raju, Co-PI, CRIDA, Hyderabad
8. KV Rao, Co-PI, CRIDA, Hyderabad
9. K Nagasree, Co-PI, CRIDA, Hyderabad
10. N Ravikumar, Co-PI, CRIDA, Hyderabad
11. G Katti, CCPI, DRR, Hyderabad
12. AP Padmakumari, Co-PI, DRR, Hyderabad
13. Ch Padmavathi, Co-PI, DRR, Hyderabad
14. Jhansilakshmi, Co-PI, DRR, Hyderabad
15. CR Satpathy, Co-PI, Mohanpur
16. VS Nagrare, CCPI, CICR, Nagpur
17. Rishi kumar, Co-PI, CICR-RS, Sirsa
18. B Dharajothi, Co-PI, CICR-RS, Coimbatore
19. S Vennila, CCPI, NCIPM, New Delhi
20. Sujay dutta, CCPI, SAC, Ahmedabad

**Annexure 2****Action taken report of 2<sup>nd</sup> CAC meeting held on 8<sup>th</sup> October 2009 at PDBC, Bangalore**

Sl. No	Action point	Action taken report
<b>I</b>	<b>Technical</b>	
1.	Four species of mealybugs are being reported on cotton from the sub-project. The committee recommended that authentic taxonomic identification of the mealybug species is essential. All the consortium partners for cotton will submit specimens of mealybugs to Dr V.V. Ramamurthy, Division of Entomology, IARI for their authentic identification. Dr M. Prabhakar, Dr V.S. Nagrare, Dr B. Dharajyothi and Dr Rishi Kumar will attend a one week training program on identification of mealybugs at the Taxonomy laboratory, Division of Entomology, IARI, New Delhi (Action: CPI & CCPI, CICR, Nagpur)	Taxonomic identification of insect specimen has been authenticated from Dr V.V. Ramamurthy IARI, New Delhi. Dr B. Dharajyothi and Dr Rishi Kumar attended a one week training program on identification of mealybugs at the Taxonomy laboratory, Division of Entomology, IARI, New Delhi
2.	Similarly three species of mirids, several parasitoids and predators reported may also be got identified by taxonomist. Several unidentified weed hosts are found to serve as alternate hosts for mealybug species in different cotton based cropping systems. These weed species may also be properly identified with the help of botanists (Action: CPI & CCPI-CICR, Nagpur)	Insect specimen of mirids, parasitoids and predators got identified from Taxonomy laboratory, Division of Entomology, IARI, New Delhi. Weed species identified from botanists of Dr Panjabrao Deshmukh Krishi Vidyapeeth, Akola (Maharashtra), Chaudhary Charan Singh Krishi Vishwa Vidyalaya, Hisar (Haryana) and Botanical Survey of India, Coimbatore (Tamil Nadu).
3.	While investigating mealybug incidence in relation to cotton based cropping systems, emphasis may be laid on quantifying the incidence on plant species in crop fallows, uncultivated fallows and other adjoining crops along with the incidence on the main crop and also relate to the cultivation history of the field, soil type, input use (fertilizer, pesticide and irrigation water) (Action: CPI and CCPI-CICR, Nagpur)	Data have been collected as per the suggestions.

4.	Year round weather data of temperature and humidity may be collected for developing relationships with pest incidence. Analysis of pest incidence data vis-à-vis weather data may be taken up immediately without waiting till the end of the season as this would facilitate more appropriate and intensive data collection during the season itself. Past pest-weather data available at the centre should be submitted to the lead centre for adding to the database (Action: All CCPIs).	Collected year round weather data of temperature and humidity for developing relationships with pest incidence. Past pest-weather data available at the centre submitted to the lead centre for adding to the database.
5.	While recording the alternate hosts for target pests, ascertain whether it is a true alternate host or infested by chance and also quantify the extent of parasitisation of the pest stages on alternate hosts throughout the year by focusing on key alternate hosts in the area (Action: All CCPIs)	Hosts of the mealybug were recorded based on the completion of life cycle and as well as infestation grades. Extent of parasitisation of the pest stages on alternate hosts throughout the year have been recorded focusing on key alternate hosts in the area.
6.	As field experiments are being laid out at multiple locations, it is possible to make generalizations across locations as well depending on the uniformity/standardization of cropping system variables being investigated vis-à-vis pest incidence. This approach is likely to lead to a DSS by building on the integrated work initiated on data collection framework, population dynamics, insect phenology, spatial analysis through RS and GIS (Action: All CCPIs)	Field experiments were laid out at different 5 locations at each zone and collected data based on the infestation.
7.	More emphasis needs to be given for cropping system based studies in the work on rice pests. Studies similar to the cotton based cropping systems need to be taken up for uniformity of approach in the sub-project (Action: CCPI-DRR, Hyderabad)	Crop sequence has been taken into account while collecting data
8.	Presentation of progress by CCPI on rice based cropping systems needs improvement clearly bringing out the activities taken up during the half year and since inception with supporting data. Compiled report for all the rice centres in the prescribed format may be prepared by CCPI, DRR at the time of half-yearly and annual progress report submission (Action: CCPI-DRR, Hyderabad)	Compiled progress report will be submitted
9.	The committee took note of the very low incidence of rice leaf folder being reported at Coimbatore centre under the rice based cropping systems for rabi 2008-09 and kharif 2009 contrary to the expectation that this is an endemic	AICRP centre at Pattambi, Tamilnadu has been identified for collecting data on rice leaf folder. Work has been carried out at the centre.

	area for leaf folder. The CCPI also felt that the incidence reported is very low for both the seasons. In view of the changed scenario, it was felt that rice leaf folder is no more a major pest in that area and it was decided to discontinue the Coimbatore associate centre for rice (Action: CCPI-DRR, Hyderabad)	
10.	Caution may be exercised in the work on extrapolation of pest model outputs using spatially derived meteorological variables and crop vegetation indices as relationships are being attempted with scanty data. Weekly count data on rice BPH and damage assessment along with crop information from 25 well distributed locations in the West Godavari district may be attempted during the ensuing rabi season. This data may be analyzed along with RS based indices (NDWI, TVDI, NVDI etc.) and weather parameters (both spatially derived and IMD data). Identification of crop stage and assessment of crop damage will lead to better visualization of BPH occurrence and its spatial spread by using RS and GIS approaches (CPI, CCPI-DRR, Hyderabad and CCPI, SAC, Ahmedabad)	Complied with the suggestion in subsequent seasons
11.	The committee appreciated the multi-directional efforts being made by the consortium partners. However, it felt that the work on pest modelling and decision support systems is highly complex. Reacting on the CPI's plea for capacity building of the partners through a well planned international training programme on development of pest forewarning models and decision support systems, the Committee strongly felt that such an opportunity be provided to all the CCPIs working in the sub project as a group. Dr N.H. Rao, CAC member of the sub-project remarked that International training slots are available under the L&CB sub-project in operation at NAARM. The CAC felt that this group would greatly benefit if this opportunity is made available by the competent authority and strongly recommended the proposal for international training of 5 project scientists: four CCPIs of DRR, CICR, SAC, NCIPM; and one CPI, CRIDA (Action: NC, C4)	Proposal has been submitted to PIU-NAIP
<b>II.</b>	<b>Financial Issues</b>	
12.	<b>A. Funds disbursement by DRR to its associate centers:</b>	Funds release and Statement of expenditure are being submitted

	With respect to the fund disbursement by DRR, Hyderabad to its associate centres, the committee was informed that the funds meant for its 4 associate AICRP centres (Maruteru, Ludhiana, Cuttack, Coimbatore) and one centre at BCKV, Mohanpur have been released to the respective Comptrollers of the University based on clarification by Director (Finance), PIU, NAIP. This mechanism stands ratified. DRR needs to ensure timely submission of quarterly expenditure statements and utilization certificates by its associate network centres in a manner suitable for auditing its expenditure by NAIP audit. The quarterly, half-yearly and Annual SoEs submitted by DRR should clearly reflect the expenditure at its centres (Action: CCPI-DRR, Hyderabad)	accordingly in time by DRR
13.	<b>B. Reallocation within Head (NRC funds)</b>  Three environmental test chambers with a budget of Rs 9.0 lakhs (Rs 3.0 lakhs each) have been sanctioned for CRIDA, Hyderabad. The lowest quotation obtained is for Rs 6.0 lakhs mainly due to cost escalation + taxes. In view of this, CAC accorded approval for the proposal to procure one unit instead of the sanctioned three units for CRIDA, Hyderabad within the sanctioned budget of Rs 9.0 lakhs (Action: CPI)	The equipment has been procured at CRIDA by March 2010
14.	The CAC considered and recommended the proposal for procurement of accessories to the existing automatic weather stations (recently procured from other sources of funding) in place of the sanctioned three weather stations for CICR, Nagpur within the sanctioned budget of Rs 3.0 lakhs for weather station (Action: CCPI, Nagpur) (specific proposal in Annexure 1)	Items have been procured
15.	The operational funds meant for Coimbatore centre (Rs 1.07 lakhs) is reallocated for meeting the need for more intensive data collection at 25 well distributed points in West Godavari district by Maruteru centre. This centre raised a demand for Rs 1.94 lakhs for 2009-10 (enclosed) for vehicle hiring, daily labour charges and hiked wages of skilled workers on contract (Rs 5508/month). However, an amount of Rs 1.07 lakhs is already provisioned and hence the difference amount of Rs 0.87 lakhs under the same head is approved (Action: CCPI-DRR, Hyderabad)	The reallocation was not necessitated as unspent balance was available at Maruteru centre. The survey work was jointly carried out by Maruteru, DRR and CRIDA
16.	Procurement of equipment may be expedited. Unspent funds under equipment will not be revalidated for next year (Action: CPI & CCPIs of CICR and DRR)	Complied. Procurement has been completed