

# NICRA News

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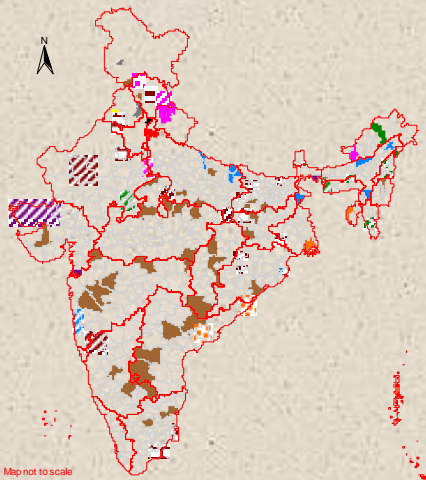
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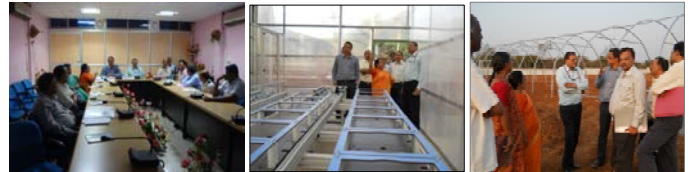
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## FROM THE RESEARCH FRONT



One of the key objectives of NICRA is to build state-of-the-art infrastructure for climate change research at core institutes. While the 100 Automatic Weather Stations and Central Data Server have already become functional, the four phenomics platforms and three Free Air Temperature Elevation (FATE) and two CTGC facilities are at final stages of commissioning and testing. The ten CO<sub>2</sub> growth chambers, one walk in environmental chamber, Eddy Covariance Flux Towers and Satellite receiving stations have already started functioning. Experimental shipping vessel and animal calorie meter are under fabrication. All the 5 GHG analysers have been installed which have started functioning. I am hopeful, by the year end over 90% of the entire infrastructure that has been planned will be completed. This will give very strong footing for basic and strategic research in climate change.

I would like to share some of the significant outcomes of NICRA. The following are a few.

- District level vulnerability atlas - two versions of the atlas - one with current scenario, second with a future exposure - are about to go to the press.
- Weekly rainfall and temperature maps are being generated from the 100 vulnerable districts.
- A set of 3200 terminal heat stress tolerant wheat accessions have been identified. Besides, 63 salt tolerant and 43 cold tolerant rice accessions have been identified from West Bengal and Arunachal Pradesh, respectively. Drought tolerant accessions (59 Nos.) and wild rice accessions (34 Nos.) have also been collected from Odisha and Jharkhand, respectively.
- An efficient web-enabled real-time pest surveillance system for monitoring as well as to develop models for pest dynamics for various climate scenarios has been initiated in crops, viz. rice, pigeonpea, groundnut, tomato and mango across various States and agro-climatic zones.

Keeping in view the scale and salience of the project, the expectations are high and the entire team is striving to meet those expectations. With the establishment of required research infrastructure, I am sure our scientists will have many more outcomes to share in the months to come.

**B.Venkateswarlu**  
Director, CRIDA

## FROM ACROSS THE KVKs



Technology Demonstration Component implemented by KVKs across 100 vulnerable districts has been making significant progress in imparting resilience to agriculture by demonstrating site specific climate resilient agricultural practices. The last year (2012) particularly was challenging in terms of delayed onset of monsoon in several places while mid-season moisture stress and floods were encountered in many villages. In keeping with the overall strategy of identifying site specific rainwater harvesting structures in drought affected areas, defunct rainwater harvesting (RWH) structures such as leaking check dams, silted up tanks and feeder channels, dry open wells and bore wells were revived on priority. Besides, the harvested rainwater was prudently used to mitigate mid season dry spells and cultivate rabi vegetables. In summary, the highlights of NRM interventions are as follows:

- Over 500 RWH structures constructed/renovated/repared; highest number of RWH structures at D.N.Halli, Tumkur, Ktk-54 farm ponds; 12 PCTs; 2 check dams; 1 tank renovation
- Created 80000 m<sup>3</sup> additional rainwater storage capacity by digging farm ponds alone
- Average increase in cropping intensity was around 20% across villages.

Identification of suitable crops and varieties to match with the vulnerable situation of the project sites was pursued as a strategy to minimize losses due to climatic variability. Each KVK was encouraged to identify suitable crop varieties released from the local SAUs and research institutes and build them into the technical interventions. The following are the highlights of the crop related interventions.

- Over 60 types of food, fodder, vegetable, fruit and plantation crops were included in demonstrations
- Over 250 varieties of these crops were demonstrated; average benefits ranged between 20-25% under a given climatic stress
- Custom hiring centers have taken off well. As some of the mechanization needs are met, new needs are being felt and farmers are demanding various kinds of devices to reduce drudgery and save time. The capacity of the farmer to pay for CHC services varies widely despite the fact that this arrangement has inculcated the habit of 'pay and use' among farmers.
- VCRMCs are playing vital role in not only creating awareness but also expediting the consensus building process among the primary stakeholders for implementing community oriented interventions.

The initial outcomes are encouraging. However, there is lot of ground to cover as this component seeks to create a model of addressing climate variability challenges through application of available technologies.

**Sreenath Dixit**  
Coordinator  
Technology Demonstration Component

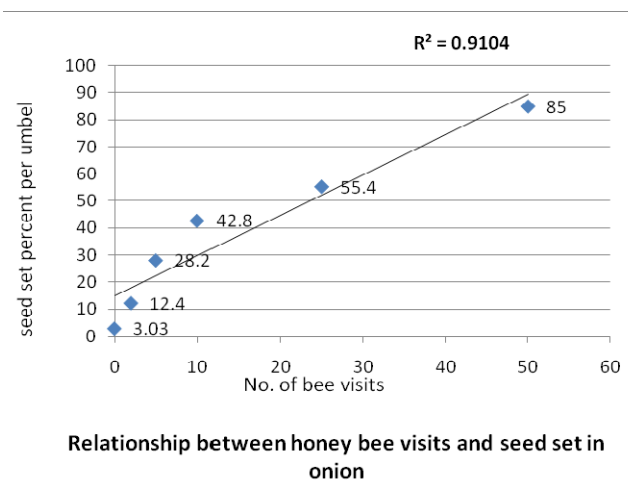
**Effect of Climatic Variability on Plant-Pollinators in Fruits & Vegetable Crops**

Scientists of Indian Institute of Horticulture Research, Bangalore are studying how plant pollinators behave in mango, watermelon & onion in the event of increased climate variability. A simple bottle trap containing a semi-synthetic medium enriched with fish proteins has been devised to attract the mango pollinator, *Chrysomya megacephala*. Pet bottles of 2L capacity were used with cubes (2 x 2x 2cm) of medium placed inside along with soil to facilitate pupation. A single trap could attract 10-15 adults, comprising about 80 per cent females. These traps can be used for multiplication as well as monitoring the population dynamics of calliphorid in relation to climate variables during off-season.

Biology of *C. megacephala* in relation to different temperature gradients is being studied. Preliminary results indicate a negative correlation of larval period with increased temperature from 28°C to 40°C. Experiments on the effect of honey bee pollination on onion seed set revealed that excluding bees resulted in about 90% reduction in seed set. A linear relationship was observed between the number of bee visits and per cent seed set, indicating the crucial role played by honey bees in onion seed set (see graph).



Bottle trap to attract *C. megacephala*



## MTU-1061 Tolerates Submergence Better than MTU-7029

KVK, Undi addresses flood related issues experienced in West Godavari district of Andhra Pradesh. During Kharif season the major paddy variety grown in this area is *Swarna* (MTU-7029). This is prone to lodging and hence leads to higher crop loss in the event of flooding/cyclone. Keeping this in view, demonstration was conducted with MTU-1061 keeping MTU-7029 as control. During the first week of November, heavy rains occurred influenced by Neelam cyclone and most of the fields were submerged due to heavy down pour. A total of 162.4 mm rainfall was recorded in Mathsyapuri village where NICRA is being implemented by KVK, Undi. Due to this, paddy fields were partially or completely submerged. It was observed that the *Swarna* (MTU-7029) variety had completely lodged due to heavy rains where as the MTU-1061 variety withstood the onslaught of Neelam. The average yield of MTU -1061 was higher by 1500 kilos when compared to that of MTU-7029.



**Swarna (MTU-7029)**



**Indra (MTU-1061)**

Parameter	MTU-1061	MTU-7029
Cost of Cultivation (Rupees ha <sup>-1</sup> )	15,000	15,000
Yield (kg ha <sup>-1</sup> )	5625	4125
Gross Income	74250	51700
Net Income	59250	36700
BCR	4.95	3.45

## Evaluation of Custom Hiring Service Centers

As part of a quick evaluation on the performance of Custom hiring service centers established under NICRA, scientists of CRIDA and CIAE, Bhopal have taken up a study with 25 randomly selected centers from across the country. Initially, CRIDA team visited KVK, Kutch (Gujarat) and KVK, Ratnagiri (Maharashtra). In village Bhalot located 35 km away from KVK, Kutch has implements like rotavator, thresher and power tiller are the most popular ones and the center has earned substantial revenue from these implements. A discussion with farmers who used these implements revealed that they were able to save 20-30% of the cost of cultivation and achieved timeliness of operations. Village consists of 155 household with cultivable area of 1016 ha. About 90% farmers belongs to small and marginal holdings. Farmers requested for adding one more rotavator to the CHC besides bullock drawn sowing machines and tractor operated sprayer. In this village, cotton and castor are major crops. From the field survey it is noticed that there is a scope for introduction of ridger planter for cotton and castor crop for in-situ conservation measure apart from sowing.



Custom hiring service center under Ratnagiri KVK was established at Haral Rautwadi village 45 km away from KVK, Lanza. The village comprises 182 household having cultivable area of 636 ha. Out of total holdings, 95% are small and marginal holdings. Power tiller, water pump, fodder cutter and sprayer have contributed significantly to the revenue generation of CHC. Farmers reported that they could save 70% of labour cost by using power tiller. This tool was found very useful by the farmers as it is very convenient for carrying out agricultural operations on small plots of land located in undulated terrain. Apart from this, the farmers reported that benefitted from timely transplanting of paddy though fields were flooded with water because of heavy rains. The rural youth were trained to operate power tiller. Water pump was used for supplemental irrigation of groundnut, horsegram and vegetable crops in group farming mode. Pump was operated for 2 h for each irrigation as against a day's requirement with conventional practice. Brush cutter is used for grafting of mango and sapota. The overall impression gathered was that farmers are very happy about this intervention, as it has solved the problem of labour shortage to a great extent.

## Stone Pitching Saves Precious Soil

In the recent past, increase in the frequency of high intensity rainfall is a great concern to farmers. Such incidences not only cause crop losses but also result in irreversible soil loss due to erosion. In order to protect precious soil from the erosion caused by high intensity rainfall, NICRA is promoting site specific interventions like stone pitching of the runoff drains. Sri Dehankar owns 4 ha land abetting a major runoff disposal drain in village Takali where KVK, Amravati (Maharashtra) is implementing NICRA. He suffered from severe erosion of his land due to runoff caused by heavy down pours. He approached the KVK scientists for a solution. He was advised to take up stone pitching of the farm bund that was exposed towards the drain and divert the runoff into the main drain so as to protect the precious soil of his field. Stone pitching was taken up in layers over the steep downstream side to provide protection and stability to the bunds. Due this intervention he has been able to bring a portion of additional land which was prone to runoff and inundation under cultivation. He could harvest soybean crop 1750 kg/ha in Kharif. The farmer is extremely happy with the intervention and nearly 25 farmers of the same village who face a similar problem have come forward to adopt this solution.



## Review Meeting of NICRA KVKs of Maharashtra

A review of progress of NICRA project was conducted for KVKs of Maharashtra on 26<sup>th</sup> February, 2013 at the Office of the ZPD, Zone V, Hyderabad. All the NICRA KVKs of Maharashtra participated in the meeting. The Programme Coordinators of NICRA KVKs presented details of progress achieved in the year 2012-13 and proposed Action Plan for 2013-14. Each programme was discussed thoroughly and suggestions were made for improving Action Plans. The focus of climate resilient interventions was sharpened keeping in view the relevance of the interventions on reducing climatic vulnerability. The overall progress of the KVKs was very good and there was a marked improvement in the way the interventions are being implemented. However, there is a need to improve the data gathering and analyses processes. Similar review meeting is planned for the NICRA KVKs of Andhra Pradesh as well.



## **Dr. A.K.Sikka, Deputy Director General (NRM) Reviews NICRA**

Dr.A.K.Sikka, Deputy Director General (NRM) visited CRIDA on 21<sup>st</sup> February, 2013 for the first time after assuming his position recently. He showed keen interest in knowing the progress of all the components of NICRA. He was particularly interested in knowing the breadth of the interventions under the Technology Demonstration Component. He made valuable suggestions for improving the documentation of successful climate resilient interventions and called for making efforts to learn from the interventions that are not working. He listened to the presentations made by the PIs of NICRA-1 & NICRA-2 and went around the facilities on both CRIDA main campus and HRF campus



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