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NEWSLETTER

ICAR-Central Research Institute for Dryland Agriculture

January-June, 2016



भाकृअनुप के महानिदेशक का स्वागत

निदेशक एवं क्रीडा के कर्मचारियों ने भाकृअनुप के नए महानिदेशक डॉ. त्रिलोचन महापात्रा, प्रख्यात वैज्ञानिक एवं अनुसंधान प्रशासक का हार्दिक स्वागत किया। आपने भारत में कृषि की वृद्धि में काफी योगदान दिया है।

CRIDA welcomes New Director General (ICAR)

Director and staff of CRIDA heartily welcome the new Director General of ICAR Dr. Trilochan Mohapatra, an eminent scientist and research administrator who has contributed immensely for the growth of agriculture in India.



संसदीय समिति का दौरा

माननीय श्री हुकुमदेव नारायण यादव जी की अध्यक्षता में संस्थान की गतिविधियों के बारे में विशेषकर जलवायु परिवर्तन के संदर्भ में अध्ययन करने के लिए कृषि पर संसदीय स्थायी समिति के 15 सांसदों के एक दल ने भाकृ-अनुप-क्रीडा का दौरा किया। निदेशक महोदय डॉ. सीएच. श्रीनिवास राव ने प्रतिनिधि मंडल का स्वागत किया। इसके बाद सांसदों ने संस्थान की पादप फिनोमिक्स प्रयोगशाला का दौरा किया। संस्थानके निदेशक महोदय ने निक्का के अंतर्गत स्थापित स्वचालित मौसम केंद्र (AWS) नेटवर्क से सही समय की मौसम मॉनीटरिंग सुविधा के बारे में जानकारी प्रदान की। प्रतिनिधि मंडल ने बारानी गैलरी का दौरा करते हुए अनुसंधान और विकास का अवलोकन किया एवं केंद्रीय बारानी कृषि अनुसंधान संस्थान की प्रसार गतिविधियों के बारे में जानकारी ग्रहण की। डॉ. सीएच. श्रीनिवास राव ने समिति के सदस्यों के समक्ष 'खाद्यान्न सुरक्षा को सुनिश्चित करने के लिए भौगोलिक परिस्थितियों एवं जलवायु परिवर्तन के प्रभाव पर आधारित वृहत कृषि अनुसंधान की एक झलक प्रस्तुत पेश की। माननीय अध्यक्ष ने अपने वक्तव्य में क्रीडा के योगदानों की भूरी-भूरी प्रशंसा की एवं वैज्ञानिकों तथा संस्थान के कर्मचारियों को उनके प्रयासों के लिए बधाई दी। अन्य सदस्यों ने भी क्रीडा के निदेशक एवं वैज्ञानिकों के वैज्ञानिक योगदानों को सराहा। इसके अलावा संपर्क संस्थान के रूप में 14 से 17 जनवरी, 2016 के दौरान संपूर्ण अध्ययन दौर के लिए की गई उत्कृष्ट व्यवस्थाओं को भी सराहा। डॉ. एस.के. चौधरी, सहायक महानिदेशक (मृदा), भाकृअनुप ने डेयर एवं भाकृअनुप की ओर से धन्यवाद ज्ञापित किया।

INSIDE

New Research Initiatives	02
Research Highlights	02
Scientific Activities	03
Contingency Plans	06
Technology Transfer	09
National Innovations on Climate Resilient Agriculture	11
News from AICRPs	13
Participation in Meetings/Seminars/Symposia	15
Important Visitors	15
Visits Abroad	16
Human Resource Development	17
Forthcoming Events	17
Awards & Recognitions	18
Personnel Information	18
Cultural & Welfare Activities	19

Parliamentary Standing Committee on Agriculture visited ICAR-CRIDA

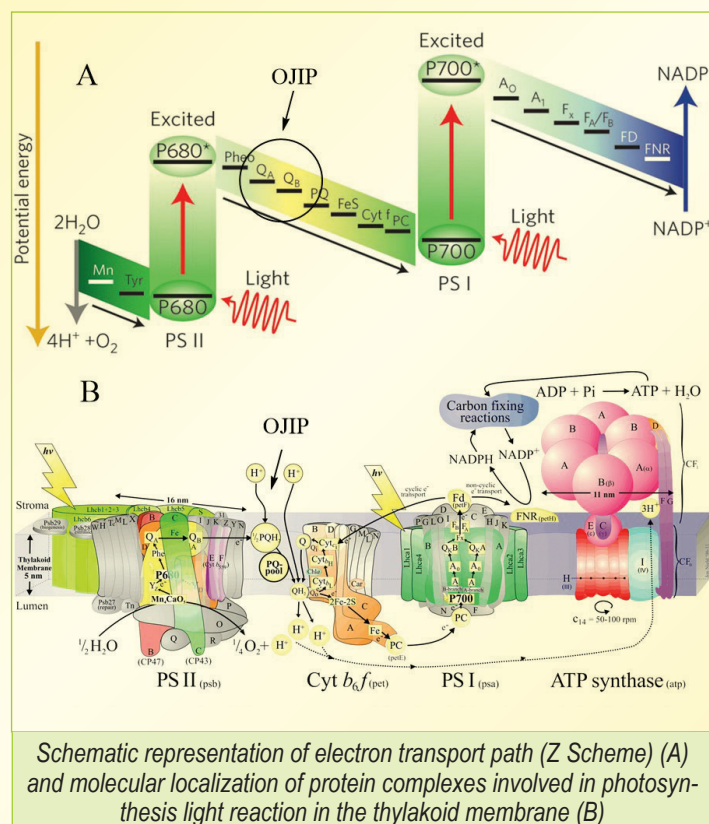
Under the Chairmanship of Hon'ble Shri. Hukmdeo Narayan Yadav, 15 members of the Parliamentary Standing Committee on Agriculture visited ICAR-CRIDA to study about the activities of the Institute, especially with reference to climate change research. Director, Dr. Ch. Srinivasa Rao received the delegation and the team visited Plant Phenomics Facility after which the Director explained to them about the real-time weather monitoring facility under NICRA-AWS network. The delegation also visited the Dryland Gallery where the research, development and extension activities of CRIDA were explained. Dr. Ch. Srinivasa Rao Director, CRIDA made a presentation on "Comprehensive Agriculture Research Based on Geographical Conditions and Impact of Climate Change to Ensure Food Security in the Country" to the committee members. Hon'ble Chairman in his remarks appreciated the contributions made by CRIDA and congratulated the scientists and other staff for their efforts. Other members also appreciated the scientific contributions of CRIDA, Director and scientists and also for making excellent arrangements for the entire study visit during 14-17th January 2016 as Liaison Institute. Dr. S.K. Chaudhari, Assistant Director General (Soils), ICAR proposed vote of thanks on behalf of DARE & ICAR.

New Research Initiatives

Chlorophyll Fluorescence Induction Kinetics and Photosystem II Dynamics: Gaining Insight into the Mechanism of Abiotic Stress

Chlorophyll fluorescence analysis has become one of the most powerful and widely used techniques available to plant physiologists and ecophysiologicalists to study the effect of stresses in plants. Specifically, chlorophyll a fluorescence represents a promising tool for detection of plant tolerance to various environmental stresses. At CRIDA a project has initiated entitled “Chlorophyll fluorescence induction kinetics and photosystem II dynamics in pearl millet (*Pennisetum glaucum* L.) under water deficit and heat stress” to study the mechanism of abiotic stress, specifically in Photosystem II of the electron transport pathway to gain insight into the effects of water and heat stress on the path of electron transfer and resultant efficiency of the photosynthetic process. The hypothesis of the study is that Photosystem II (PSII) photochemistry, light energy absorption, excitation energy trapping, and conversion of excitation energy into electron flow can be targets of stress like drought and heat and reflect on the overall growth and development of the plant. The research team proposes to study the chlorophyll fluorescence induction kinetics (OJIP) which can give a wealth of information on the energy dynamics in Photosystem II under stress. Plants respond to stress stimuli and if the stress is not eliminated in time, a rapid damage of the photosynthetic system occurs. By studying this, it is possible to understand and elucidate the specific

strategies that are employed by the plants, such as structural and functional changes in the photosynthetic systems by which they acquire new homeostasis which may be protective adaptation during exposure to abiotic stress.

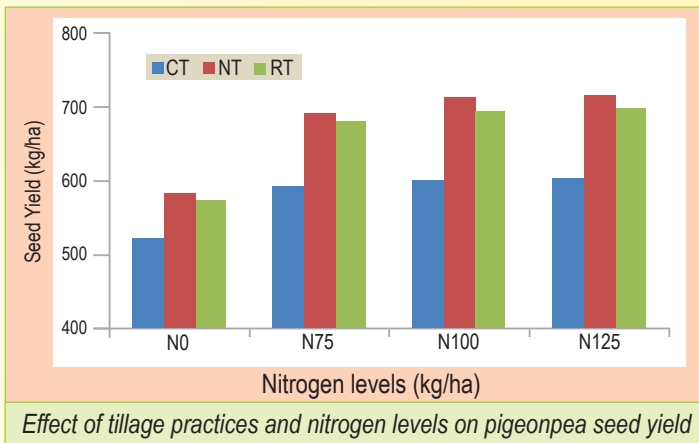


Research Highlights

Conservation Agriculture in Maize-Pigeonpea Crop Rotation

Development of economically viable tillage and nitrogen management strategies is important for conservation of natural resources and improvement of soil organic carbon, which in turn helps in increasing the productivity of crops as well as the physical health of the soil. A research project is in progress to identify optimum tillage practices and nitrogen management strategies for improving health of soil and productivity of maize and pigeonpea crops. The experiment has three tillage practices, Conventional Tillage (one pass of cultivator in summer+one pass of cultivator followed by one pass of disc harrow at the time of sowing+no residues of previous crop), Reduced Tillage (one pass of cultivator followed by one pass of disc harrow at the time of sowing+ crop residue up to 60 cm plant height of previous crop), and No Tillage (direct sowing of the crop without any tillage operation+crop

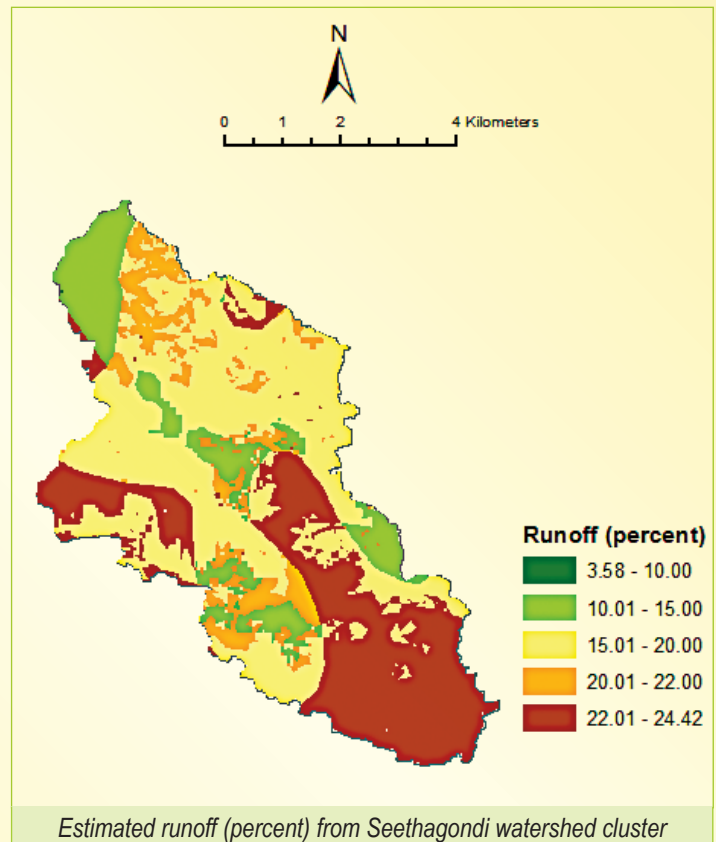
residue up to 60 cm plant height of previous crop) as main plot treatments. Sub plot treatments are four nitrogen levels, N_0 - No Nitrogen, N_{75} - 75% of the recommended dose of nitrogen, N_{100} - 100% of the recommended dose of nitrogen, and N_{125} - 125% of the recommended dose of nitrogen. Pigeonpea crop (PRG-158) was sown during kharif 2015 (the fourth year of the project) with CRIDA zero till planter. Tillage and nitrogen practices significantly influenced the seed and stover yield. About 17 and 14% higher mean seed yield, and 12 to 10% higher mean stover yields were observed in no tillage and reduced tillage, respectively as compared to the conventional tillage. About 20% significantly higher mean seed yield and 23% higher stover yield were observed with N_{125} over N_0 . About 13.3% and 5.9% higher mean soil moisture content was observed in no tillage and reduced tillage, respectively as compared to conventional tillage at 0-60 cm soil depth during the crop growing season.



Watershed Based Soil and Water Conservation Interventions Prioritization in Different Rainfall Zones

Dryland experiences very severe water stress during summer months and drought years. So, there is an urgent need for the planning and construction of suitable soil and water conservation measures for *in-situ* water conservation and rainwater harvesting to meet the water requirements for agriculture, domestic use and groundwater recharge. A project was initiated to examine the feasibility of identification of suitable soil and water conservation interventions in low, medium and high rainfall zones of Telangana using GIS. The soil and water conservation interventions need to be planned based on runoff and soil loss. Hence, spatial runoff and soil loss estimation models were developed for three ungauged watersheds namely, Zamistapur in Mahabubnagar, Goparajpalli in Warangal and Seethagondi in Adilabad districts. Soil loss was estimated spatially and temporally for the period 1951 to 2007 using RUSLE coupled with GIS. Based on the potential soil loss, suitable *in-situ* and *ex situ* interventions were selected for these watersheds. Among the three selected watersheds, higher soil loss was estimated from Seethagondi watershed cluster. Runoff was estimated spatially and temporally using SCS CN method coupled with GIS. The mean annual runoff from major portion of Seethagondi cluster was below 20% of mean annual rainfall. This runoff potential estimated was used for identifying potential locations for different soil and water conservation interventions.

A methodology was developed to find potential locations to construct different *in-situ* and *ex-situ* soil and water conservation interventions in semi-arid watersheds. Thematic layers of slope, rainfall, soil map and land use land cover were clipped for these three watersheds and selected criteria was developed for finding suitable locations. The interventions like Rock Fill Dams, ponds, check dams etc. were determined by applying the selected criteria using GIS in three stages. At stage one, the locations were identified based on land use land cover, slope, rainfall, soil texture and soil depth. At stage two, the number of structures and suitable sites were identified based on slope, vertical and horizontal intervals. At stage three, these locations were further optimized based on the surplus runoff availability after *in-situ* water conservation. The locations determined were validated by exporting to Google Earth and by using ground truth data.



Scientific Activities

National Science Day

The National Science Day was celebrated at ICAR-CRIDA in association with National Academy of Agricultural Sciences - Hyderabad Chapter on 29th February 2016. On this occasion a quiz competition was conducted in which Class IX students of Kendriya Vidyalayas in Hyderabad participated. All the school children and accompanying teachers first visited the Dryland

Gallery followed by Open Top Chambers facility where they were explained about the on-going research activity and climate change research, respectively. A quiz competition was conducted in three rounds viz. General Science, Agriculture and Rapid fire (General Knowledge). The team from Kendriya Vidyalaya, AFC, Begumpet bagged the first prize while second and third prizes were bagged

by KV Kanchanbagh and KV-1 AFA, Dundigul respectively. In the valedictory function, Dr. Ch Srinivasa Rao, Director, CRIDA gave prizes to winners and participation certificates to students. He

appreciated the interest shown by the students and encouraged them to participate in many more competitions of this nature which will help in their overall personality development.



Celebration of National Science Day

National Symposium on "Organic Farming for Farmers' Prosperity"

The National Symposium on "Organic Farming for Farmers' Prosperity" was jointly organized by Ekalavya Foundation, National Institute of Rural Development and Panchayat Raj and ICAR-Central Research Institute for Dryland Agriculture at NIRD & PR, Hyderabad during 19-20 March 2016. His Excellency Shri Acharya Dev Vrat, Hon'ble Governor, Himachal Pradesh inaugurated the symposium. In his inaugural address, he emphasized on integrated organic farming systems including crops, livestock

and other sectors for enhanced profitability. The sessions were organized in four round tables. Dr. Ch. Srinivasa Rao, Director, ICAR-CRIDA presented lead paper on research needs in pre and post harvest sectors to promote organic farming. Shri Radha Mohan Singh, Hon'ble Union Minister for Agriculture & Farmers' Welfare graced the valedictory function and appreciated the efforts of the participants in identifying crucial issues and suggested that a meeting with task force on organic and non-chemical agriculture would help in taking them further. He highlighted the efforts of the Government for the welfare of the farmers in general and in particular to promote organic agriculture.



Shri Radha Mohan Singh, Hon'ble Union Minister for Agriculture & Farmers' Welfare giving valedictory address

Brainstorming Meeting on "Future Thrusts and Strategies for Agrometeorological Research, Education and Extension in India"

A brainstorming meeting on "Future Thrusts and Strategies for Agrometeorological Education, Research and Extension in India" was organized during 29-30th April 2016 at ICAR-CRIDA, Hyderabad. The meeting was presided over by Dr. Ch. Srinivasa Rao, Director and Dr. S.M. Virmani, formerly Principal Scientist, ICRISAT, was the chief guest. Dr. AK. Singh, Vice Chancellor, RVSKVV, Gwalior, Dr. B. Venkateswarlu, Vice Chancellor, VNMKV, Parbhani



and Dr. S. Pasupalak, Vice Chancellor, OUA&T, Bhubaneswar were the guests of Honor. The meeting had three concurrent sessions - Education in Agrometeorology, Status of Agrometeorological Research and Extension of Agrometeorology. Later, in a common session 8 panelists presented their suggestions on all the three topics. In the plenary session, Chairman Dr. B. Venkateswarlu presented five recommendations finalized for each topic for improving agrometeorological education, research and extension in India.



Various events during Brainstorming session

31st Foundation Day Celebrations

ICAR - Central Research Institute for Dryland Agriculture (ICAR-CRIDA), Hyderabad, celebrated its 31st Foundation Day on 12th April, 2016. Dr. Gurbachan Singh, Chairman, ASRB, New Delhi was the Chief Guest of the function. The Director, CRIDA, Dr. Ch. Srinivasa Rao, in his welcome address highlighted the achievements of the Institute and appreciated the contributions of the predecessors as well as employees in the growth of the Institute. He also highlighted the activities planned for the future and the action plan to implement the same. On this occasion, 20 farmer innovators from 10 states - Telangana, Andhra Pradesh, Maharashtra, Karnataka, Tamil Nadu, Kerala, Gujarat, Chhattisgarh, Madhya Pradesh and Odisha were felicitated for their

innovative farming practices for enhancing productivity and climate resilience. The best performing staff from Technical, Administrative and Supporting categories in CRIDA were also recognized. Dr. Gurbachan Singh, in his foundation day lecture highlighted the importance of research, extension and participatory approaches for enhancing farm level profitability in rainfed drylands and the significant role CRIDA played in developing location specific rainfed technologies through its network centres, NICRA program and 151 climate resilient villages established across the country, 600 district agriculture plans towards adaptation to climatic variability and extreme climatic events, etc. He also appreciated the work of CRIDA through its coordination with various national programs and state rainfed mission for ground level implementation.



Foundation Day Celebrations

IRC Meeting

IRC meeting was conducted in two phases, the 1st phase was held on 10th May, 2016 and the 2nd phase during 1-2 June, 2016. Progress of ongoing projects under all the divisions was discussed in detail and suggestions were made. Four new projects were approved, 17 projects concluded and 10 projects were extended in the IRC.



RFD Meetings

The RFD (Results Framework Document) committee of the institute met on 2nd January, 4th February, 2nd March, 1st April, 5th May and 4th June, 2016 for finalizing targets to be submitted against each success indicator for the months of January, February, March, April, May and June respectively. On 2nd March, 2016 the achievements against each success indicator for the year 2016-17 were finalized by the RFD committee of the institute. On 1st April, 2016, Dr M. Osman, Nodal Officer and Dr S S Balloli, Co-nodal Officer of the



institute presented the achievements for the year 2015-16 and targets set for the year 2016-17 to the entire staff of the institute and the same were communicated to the Nodal Officer of the Natural Resource Management Division of ICAR.

Contingency Plans

Contingency Preparedness Meetings

ICAR-CRIDA along with Department of Agriculture, Co-operation & Farmers welfare and Department of Agriculture of respective states organized contingency preparedness meetings in the various states to operationalize district contingency plans for kharif 2016. The meetings were attended by State Agriculture Department officials, other line department functionaries, state agricultural universities, Program Coordinators of KVKs, representatives of local ICAR Institutes, AICRPDA, AICRPAM centers, farmers, press and media.

Details of State wise Interface Meetings

Sl. No.	State	Place	Organised on
1	Andhra Pradesh	Kurnool, Andhra Pradesh	11-05-2016
2	Maharashtra	Pune, Maharashtra	14-05-2016
3	Telangana	ICAR-CRIDA, Hyderabad	17-05-2016
4	Jarkhand	Ranchi	24-05-2016
5	Karnataka	GKVK campus, Bengaluru	26-05-2016
6	Bihar	ICAR-Research Complex for Eastern Region, Patna	30-05-2016
7	West Bengal	Kolkatta	31-05-2016
8	Madhya Pradesh	Bhopal	21-06-2016
9	Gujarat	Ahmedabad	23-06-2016
10	Assam	Guwahati	27-06-2016
11	Meghalaya	Umiam	28-06-2016

Andhra Pradesh

Based on the forecast of deficient monsoon rainfall in central and southern Andhra Pradesh, an interface meeting for enhanced preparedness for kharif, 2016 was jointly organized on 11th May, 2016 at Kurnool, Andhra Pradesh. The seasonal forecast indicated that parts



of districts in Krishna, Godavari, Prakasam, Anantapur, Chittoor and Kurnool are expected to receive deficient monsoon in kharif season, 2016. Dr. Ch. Srinivasa Rao, Director, ICAR-CRIDA informed the status of monsoon and various interventions taken during past two years and considering the experiences of last two drought years, the preparedness need to be strengthened. Sri T. Vijaya Kumar, Special Chief Secretary, Government of AP, thanked

ICAR for this initiation and suggested that contingency measures should include both management practices and provision for supply of seeds.

Maharashtra

An interface meeting on enhanced preparedness in Maharashtra for Kharif 2016, was held on 14th May, 2016 at Pune, Maharashtra. All regions in Maharashtra are expected to receive above normal rainfall during kharif season, 2016. Dr. KV Rao, ICAR-CRIDA informed the status of monsoon and various interventions (both preparedness and mid course corrections) taken during past two



years. Sri Vikas Deshmukh, Commissioner (Agriculture) thanked ICAR for this initiation and advised department officials that contingency plan should not be visualized only for drought scenario but also for excess rainfall pattern. Sri KV Deshmukh, Director (Agriculture) appraised the audience about the action taken during kharif 2015-16, one of severest drought in Marathwada region, on interventions taken up to mitigate dry spells in different districts.

Telangana

An interface meeting on enhanced preparedness for agriculture contingencies in Telangana for Kharif 2016 was organized on 17th May, 2016 at ICAR-CRIDA, Hyderabad. All districts in Telangana are expected to receive normal rainfall during kharif season, 2016.

Parts of Adilabad and Nizamabad districts are expected to receive above normal rainfall. Representatives of local ICAR Institutes and AICRPDA,



AICRPAM centers, farmers attended the workshop. Dr. KV Rao, ICAR-CRIDA informed about the expected rainfall during the kharif, 2016 across the districts of Telanagana. Sri C Partha Sarithi, Principal Secretary (Agriculture), urged the line department officials to be prepared to address various weather related contingencies which are becoming common due to the unpredictable nature of monsoon.

Jharkhand

An interface meeting for enhancing the preparedness of agricultural contingences in kharif 2016 for Jharkhand at Ranchi on 24th May 2016. The meeting was chaired by Mr. Jata Shankar Choudhary, Director of Agriculture, Government of Jharkhand. Dr. KK Sharma, Director, IINGR and Dr. AK Singh, Head, ICAR-RCER, Directors of Research, BAU, Director (Seeds), BAU, Senior Agricultural Officers, Program Coordinators of KVKs, and other senior officials participated in the meeting. Mr. Choudhary presented overall scenario of the state during last year and efforts made by the Department to tackle the situation. Dr KV Rao presented the purpose of the meeting as well as weather forecast analysis and cautioned about mid season dryspells.

Karnataka

An interface meeting for enhancing the preparedness of agricultural contingences in kharif 2016 for Karnataka at GKVK Campus, UAS Bengaluru on 26th May 2016. Smt. Latha Krishna Rau, IAS, Additional Chief Secretary, GoK, Dr H Shivanna, Vice Chancellor, UAS Bengaluru,



in her inaugural address asked the delegates to manage the early, mid and late season droughts through technological interventions for improving the

productivity and livelihoods of the farmers. The Chief Scientists of AICRPDA Bengaluru, and Vijapuracentres appraised the house about the available technology options for mitigating the adverse weather conditions for different parts of Karnataka.

West Bengal

An interface meeting for enhancing the preparedness of agricultural contingences in kharif 2016 for West Bengal at Kolkatta on 30th May 2016. Mr. Sanjeev Chopra, IAS, Additional Chief Secretary and Principal Secretary, Agriculture chaired the meeting. Dr. GC Debnath, DDG, IMD gave an overview of weather prediction for the kharif season. Dr KV Rao presented about contingency plans, SASCOF weather



analysis, and how to go ahead with preparedness and also informed the house about purpose of the meeting. Dr. Bhattacharya made a

presentation on agricultural contingency situation of 2015 and how it was handled.

Bihar

An interface meeting on 'Enhancing the Preparedness for Agricultural Contingencies in Bihar for Kharif 2016' was organized on 30.05.2016 at ICAR-Research Complex for Eastern Region, Patna.

More than 60 officials from ICAR institutes, KVKs, SAUs and CGIAR institutes of Bihar participated in the meeting. In his introductory



remarks, Dr Bhatt appreciated the efforts made by the ICAR-CRIDA, Hyderabad in making the district wise contingency plans to mitigate the adverse effects of expected drought situations, suggested to prepare well to various climatic vulnerabilities such as flood, drought in the state of Bihar. Dr. Ch. Srinivasa Rao, Director, CRIDA, Hyderabad made a brief remarks on the purpose of the meeting and informed that the district based contingency plans have already been prepared for 614 districts in the country including 38 districts of Bihar and emphasized that the implementation of the various interventions in contingency plan should be location and situation specific. Dr. Rao also emphasized that there is a need to create awareness among the farmers and line departments about preparedness to overcome flood or drought situations.

Madhya Pradesh

An interface meeting on enhancing the preparedness for agriculture contingencies during kharif 2016 for Madhya Pradesh was jointly organized by ICAR-Central Research Institute for Dryland Agriculture (CRIDA), ICAR-Indian Institute of Soil Science (IISS),

Department of Agriculture, Government of Madhya Pradesh and DAC on 21st June, 2016 at ICAR-IISS,



Bhopal. Sri PC Meena, Agriculture Production Commissioner, Govt. of MP, thanked ICAR for this initiation and advised department officials that contingency plans are to be prepared for excess rainfall pattern. Dr. KV Rao, ICAR-CRIDA informed the status of monsoon and stressed upon the need for contingency preparation in view of above normal rainfall which, if not prepared well,

leading to problems of seasonal water logging due to large scale black soils in the state. Shri Rajesh Rajora, Principal Secretary (Agriculture) stressed on contingency plans for each district as the variability in rainfall is high with less number of rainy days coupled and high intense storms in recent years which is causing loss to farmers. Shri RB Sinha, Joint Secretary, DAC, MoA&FW, called for impact assessment of contingency plans in overcoming weather aberrations during last two years in the state. Sri ML Meena, in his address, remarked that there needs to be a realistic action plan to be prepared based on the available contingency plans.

Gujarat

An interface meeting was held on 23rd June 2016 for enhancing the preparedness for agricultural contingencies during kharif 2016 in the state of Gujarat.

The main objectives of this meeting were to: a) educate on the status of monsoon during kharif 2016; b) document the experiences of implementing the contingency measures during the last year and c) to review the plans being made to tackle the weather aberrations for the current year. The meeting was chaired by Dr. SR Chaudhari, Director of Agriculture, Government of Gujarat and attended by Dr. RA Sherasiya, Director of Horticulture, Dr. KS Detroja, Additional Director Agriculture, Directors of Research and Extension of SAUs, Joint Directors of Agriculture of different zones, district agricultural officers of all districts.



Scientists of AICRPDA and AICRPAM centres, representatives of KVKs and input agencies participated in this meeting. Dr Mohammed Osman, Principal Scientist and Head PME cell, CRIDA appraised the house about the purpose of the meeting and status of monsoon during kharif 2016. Dr SR Chaudhari shared the department experiences in managing the weather aberrations during kharif 2015 and also department's preparedness for tackling any weather aberrations during kharif 2016.

Assam and Meghalaya

Interface meetings on enhancing the preparedness for agriculture contingencies such as floods and mid season droughts during kharif 2016 for North East Region were jointly organized by ICAR-Central Research Institute for Dryland Agriculture (CRIDA), ICAR Research Complex for North East Region, Umiam and DAC along with state departments of agriculture i.e Assam and Meghalaya at Guwahati and Umiam on 27th June and 28th June respectively. The meetings started with the discussions on the purpose of this interface meeting, state wise monsoon forecast for both Assam and Meghalaya. Based on the SACOF-8 forecast, many districts in both the states are expected to receive below normal rainfall during the present kharif season. The deliberations included this measures to be taken for mid season long dry spells.



General Recommendations made during Interface Meetings

- Climate resilient practices like community based staggered nursery, mechanical transplanting, etc. need to be promoted.
- As the short duration varieties of rice are more preferred for contingency, seeds of short and medium duration varieties of rice need to be produced.
- *In-situ* soil moisture conservation should be focused for contingency planning. Small water harvesting structures need to be developed in large numbers.
- Diversification with contingent crops and small and minor millets is required.
- Quality seed availability of contingent crops including fodder is a major problem therefore seed bank should be created in every zone.
- Hailstorm is also becoming a regular phenomenon in the state; hence, it should also be kept in mind while making the contingency planning.
- Demand aggregation of seed requirement of the district for different crops should be carried out in advance.
- As the Government is providing huge subsidy on Solar pumps, it should be promoted for life saving irrigation.
- More focus is to be given on management practices to save this standing crop.
- Field based measures are to be given preference to overcome problems of above normal rainfall.
- Awareness on contingency plans to be provided to officials working at sub-district level.

For further details please visit web link: www.crida.in

Technology Transfer

Field Day under NFSM Programme

A field day on cluster frontline demonstrations on chickpea under National Food Security Mission (NFSM) for Rabi 2015-16 was organized on 8 February 2016 at Kandlapalli village, Pudur mandal and Pamina village, Chevella mandal, Ranga Reddy District. Dr. K. Dattatri, Principal Scientist, ATARI, coordinating the NFSM programme on pulses and oilseeds in Zone-V, accompanied by Dr. Basudeb Sarkar, Principal Scientist (Plant Breeding), CRIDA, Hyderabad and Dr. M Prabhakar, Head, KVK monitored the demonstrations being conducted by KVK Ranga Reddy District.

Brain Storming cum Awareness on Mitigating Fodder Shortage and Disease Management

One-day brain storming session cum awareness programme on mitigating fodder shortage and disease management in small ruminants during drought was organized at CRIDA-KVK on 23rd February 2016.

About 40 farmers from Ranga Reddy, Medak, Nalgonda, Mahabubnagar, Karimnagar and Khammam districts



participated in the program. Dr. V. Ashok Kumar, Assistant Director, Department of Animal Husbandry, Govt. of Telangana was the chief guest for the program. who gave detailed presentation on sheep and goat farming aspects covering nutritional importance, diseases management during different seasons, vaccination and deworming schedule.

Exposure Visit to Farmers of Mahabubnagar District

Twenty six farmers from adopted villages of KVK - Palem, Mahabubnagar attended a one day training cum exposure visit to KVK - CRIDA on 2nd March 2016. They were shown dryland technologies developed

by CRIDA through video presentation followed by presentation by respective subject matter specialists on vegetables



production technologies (shadenet nurseries, mulching, raised bed method, pest and disease management), farm mechanization and soil water conservation methods, fodder technologies and livestock management. They were also taken on field visit to KVK model watershed, raised bed cultivation of vegetables, fodder cafeteria and farm implements.

Rabi Kisan Sammelan

A one-day Rabi Kisan Sammelan was organized on 5 March 2016 at Maheswaram village covering three mandals viz., Maheswaram, Saroornagar and Kandukur in collaboration with DOA, Govt. of Telangana. Shri. Teegala Krishna Reddy, Hon'ble Member of Legislative Assembly, Maheswaram inaugurated the Exhibition Stalls in the presence of local elected representatives, ADA (Maheswaram), MDO and MRO. Hon'ble MLA interacted with KVK scientists on different

activities displayed in the stalls. He presided over the Farmers Scientist Interaction meeting and urged the farmers to adopt the latest technologies and make use of the opportunity to know the advances in agriculture.



Dr. M. Prabhakar, Head, KVK briefed the farmers about mandate of KVK and explained to farmers the services rendered by KVK. Live demonstrations on vegetables (mulching, shade net, nurseries), fodder crops, vermicomposting, biofertilizers, pheromone traps, sticky traps, farm implements, Azolla and silage making, millet based food products, amla value added products were shown to the farmers. Different display stalls by private industries viz., Jain Irrigation, Tirumala Engineering Works, Satya Pet & Vet (Veterinary medicines / vaccine) were put up for the benefit of farmers. About 158 farmers from eight nearby villages participated in the program. This programme was organized by CRIDA-KVK in collaboration with Department of Agriculture, Govt. of Telangana.

ICAR-CRIDA Stall at the Launch of International Year of Pulses

ICAR-CRIDA had participated in the launch of 'International Year of Pulses' by ICAR-Indian Institute for Pulses Research at Kanpur on 13th March, 2016. On this occasion an exhibition stall was put up to showcase CRIDA technologies, achievements and services to farming community. The Hon'ble Union Minister of Agriculture & Farmers Welfare, Shri Radha Mohan Singh launched the programme and visited the stall. About 2000 farmers including farm women participated in the programme. Dr. G Nirmala, Principal Scientist (Agrl. Extension), Dr. B Sanjeeva Reddy, Principal Scientist (FMP) and Shri S. Vijaya Kumar, SMS, KVK, participated in the programme.



Exposure Visit of Farmers from Tamil Nadu

Twenty farmers from Trichy District, Tamil Nadu along with two Agriculture Extension Officers visited CRIDA-Krishi Vigyan Kendra, Hayathnagar Research Farm on 14 March 2016. The farmers interacted with the KVK specialists on different production and protection aspects of crops like maize, cotton, vegetables and fodder crops. The visitors were taken on field visit and to KVK model watershed, field demonstration units of plastic mulching, vermin composting and fodder cafeteria. The subject matter specialists of KVK explained the fodder technologies developed at CRIDA-KVK and different aspects of livestock management. The farmers also visited the farm implements unit and the biofertilizer production facility at KVK.

ICAR-CRIDA Stall at Krishi Unnati Mela

ICAR-CRIDA participated in the 'Krishi Unnati Mela' organized by IARI at Pusa campus from 19-21 March, 2016. On this occasion an exhibition stall was put up to showcase CRIDA technologies, achievements and services to farming



community. Hon'ble Prime Minister, Shri Narendra Modi inaugurated 'Krishi Unnati Mela'- the National Level Agriculture Fair-cum-Exhibition on 19.03.2016 at IARI campus, New Delhi. He also launched a mobile application for farmers - "Kisan Suvidha", which provides information to farmers on subjects such as weather, market prices, seeds, fertilizers, pesticides and agriculture machinery. The Honorable Union Minister of Agriculture & Farmers welfare, Shri Radha Mohan Singh and Dr. Trilochan Mohapatra, Secretary (DARE) & DG, ICAR visited the stall. About 50000 farmers, farm women participated in the programme. Dr. D.B.V. Ramana, Shri. B. Narsimlu, Dr. A.K. Indoria, along with technical officers participated in the mela.

Farmers Fair on Fasal Bima Yojana by CRIDA-KVK

Shri Bandaru Dattatreya, Union Minister for Labour and Employment inaugurated the Farmers' Fair during 7th April, 2016 on Pradhan Mantri Fasal Bima Yojana (PMFBY) organized by KVK, CRIDA at Gaddamallaiahguda village in Yacharam mandal of Rangareddy district of Telangana. Shri Boora Narsaiah, Member of Parliament, Bhongir Constituency expressed that the Fasal Bima Yojana is a boon to the farmers of Rangareddy district which experiences recurring drought

and crop damage due to extreme events. Shri Manchireddy Kishan Reddy, MLA, Ibrahimpatnam constituency, local representatives, senior officers of line departments and ATMA participated in the program. Dr. M. Prabhakar, Head, KVK, CRIDA organized the program which was attended by more than 1000 farmers including 250 farm women. Live demonstrations of technology interventions were exhibited, literature on PMFBY in Telugu was distributed, technology packages were released and a video on PMFBY was displayed to the farmers.



Scientific Advisory Committee (SAC) Meeting

Scientific Advisory Committee meeting of ICAR-CRIDA-KVK Ranga Reddy was held on 20 May 2016. The meeting was presided over by Dr. K. Sammi Reddy, Director I/c, CRIDA and Chairman SAC. Dr. Y.G. Prasad, Director, ATARI, Zone V, Dr. B. Subbarayudu, Project Director, ATMA-RR District, Dr. B. Singh, Director, Regional Station for Forage Production and Demonstration were the chief guests. The progress of activities of KVK for the year 2015-16 was thoroughly reviewed and action plan for the year 2016-17 was discussed. Dr. M Prabhakar, Principal Scientist and Head, KVK presented summary of KVK progress.



Mera Gaon Mera Gaurav (MGMG)

MGMG programme is being implemented in ICAR-CRIDA in 7 districts of Telangana and 1 district of Andhra Pradesh with 60 scientists of the Institute. During the period January – June, 2016 the following activities were undertaken in the programme.

District (Villages)	Activities
Mahabubnagar (Padara, Chitlam Kunta, Udimalla, Petrallachenu, Ippalapally)	<ul style="list-style-type: none"> Awareness meeting on small ruminant farming, fodder management & efficient water management on farm pond. Awareness and training on measurement of rainfall with rain guage to farmers Training on cultivation of Azolla in farm pond Hybrid napier and Subabool varieties were distributed for demonstration covering 2 hectares of land. (310 farmers)
Ananthapur (Singampallythanda, Kothapally, Pampanur and Pampanur thanda)	<ul style="list-style-type: none"> Farmers have been communicated on weather forecasts through mobile SMS messages. (50 farmers)

District (Villages)	Activities
Warangal Jafferugdem cluster (Ramanna-gudem, Jalthanda, Kusumbai thanda Satyanarayanapuram and Pothibbatil thanda)	<ul style="list-style-type: none"> Soil analysis and distribution of soil health cards to farmers (50 farmers)
Medak (Julkal, Tarpole and Uttarpalli)	<ul style="list-style-type: none"> Awareness meeting on crop diversification Use of rhizobium seeds treatment for soybean Maize variety DHM-117 & PRG-176 Red gram variety demonstration. (60 farmers)
Nalgonda Patharlapahad Cluster (Kotha thanda, Bapuji thanda, Lakma thanda, Arka thanda, Ayyavari thanda)	<ul style="list-style-type: none"> Green-Sim distribution to 50 farmers. Mobile based agro advisories -6000 voice messages per month Farm Implements distribution to farmers Collection of soil samples and analysis. (194 farmers)

National Innovations on Climate Resilient Agriculture

NICRA-TDC Annual Review Workshops of Various Zones KVKs

The Annual review and action plan workshop of KVKs involved in NICRA Technology demonstration component was organised in all the 8 zones. Detailed discussions were held & experts gave the suitable suggestions for the improvement of action plans. During workshop the annual progress was reviewed.

Sl.No.	KVKs Zones	Place	Organised on
1	Zone –VI	Jodhpur	April 16, 2016
2	Zone – IV	Kanpur	April 18-19, 2016
3	Zone –II	Kolkata	April 21-22, 2016
4	Zone –V	Ahmednagar, Maharashtra	May 3-4, 2016
5	Zone – III	Jorhat, Khanapara, Assam	May 6-7, 2016
6	Zone – VIII	Bengaluru	May 10-11, 2016
7	Zone – VII	Dewas, Madhya Pradesh	May 12-13, 2016
8	Zone –I	Ludhiana	June 2, 2016

NICRA-TDC Annual Review Workshop of Zone-VI KVKs

Annual Review Workshop of NICRA Krishi Vigyan Kendras of Rajasthan and Gujarat States was organized under the Chairmanship of Dr S K Singh, Director, ATARI, Jodhpur on 16th April, 2016m, in which Annual Progress Report of 2015-16 was presented by PCs of various KVKs and the Action Plan for 2016-17 was finalized. Dr. PP Rohilla, Nodal Officer of NICRA project presented the significant achievements under TDC component by NICRA KVKs for the year 2015-16. The Chief Guest Dr. Ch Srinivas Rao, Director, CRIDA in his inaugural address pointed out about the climatic variability in the country and how NICRA is addressing the issues related to climatic vulnerability in various districts of the country. He requested KVKs to scale up the significant interventions for larger impacts and benefits. Dr. Yadav, Director, CAZRI spoke about the effects of climate change on crop and livestock husbandry particularly in the arid regions of the country. Dr. JVNS Prasad, spoke about the expected outcomes from the review workshop and advised KVKs to focus interventions for addressing the climatic vulnerability and also the necessity of preparing contingency plan for NICRA villages for the next Kharif season.

NICRA Annual Review Workshop of Zone-IV KVKs

The Annual Review and Action plan workshop of KVKs involved in NICRA Technology Demonstration Component was held at ICAR-ATARI (Zone-IV), Kanpur during 18-19 April, 2016. In this

workshop, 15 KVKs involved in NICRA participated. Dr. A.K Singh DDG (AE), ICAR, New Delhi inaugurated the workshop. He highlighted the climatic variability in the experienced in the zone and the approach adopted by the NICRA to address the variability. He spoke about the strategies to be adopted for the kharif season for addressing the climatic availabilities such as drought, flood, cold stress, concerns of ground water depletion and salinity. Dr.U.S. Gautam, Director, ICAR-ATARI Kanpur presented the performance of NICRA and significant achievements. Dr. JVNS Prasad, CRIDA, Hyderabad spoke about the need for focusing interventions related to the climatic variability and also the need for preparing a contingency plan for the NICRA villages in the zone for addressing the vulnerabilities this kharif season.

Dr. Atar Singh PS (Agron) & Nodal Officer NICRA & NIFTD presented overall progress of the NICRA project of the zone. Fifteen KVKs of NICRA participated in the workshop and presented the Annual Progress Report of 2015-16 and the Action Plan for 2016-17. Dr. S. K. Dubey, PS (AE) proposed the vote of thanks. During the two days, the annual progress and the action plans for the forthcoming year of all the NICRA KVKs were discussed and finalised.

NICRA-TDC Annual Review Workshop of Zone-II KVKs

Annual Review Workshop of NICRA Krishi Vigyan Kendras of Bihar, Jharkhand, West Bengal and the Union Territory of Portblair was organised at ATARI-II, Kolkata under the chairmanship of Dr SK Roy, Director from 21-22 April 2016. Dr. Ch Srinivas Rao, Director, CRIDA was the Chief Guest. Dr F.H. Rahman, Nodal Officer of NICRA project presented the significant achievements under TDC component by various KVKs of the zone for the year 2015-16. The Chief Guest in his inaugural address pointed out the rainfall variability particularly the last years in various states of the zone. Dr. Ch Srinivasa Rao, Director, CRIDA spoke about the initiatives taken up under NICRA in addressing the climatic variability in the country. He emphasised on the need for scaling up the significant interventions for larger impacts and benefits. Dr B Shahi, KVK Nodal Officer, RAU, Pusa, Dr S C Sarkar, Director Extension, UBKV Dr R.N. Singh, ADEE of BAU, Bihar participated in the meeting and guided the respective KVKs. Dr. JVNS Prasad, spoke about the expected outcomes from the review workshop and advised KVKs to focus interventions for addressing the climatic vulnerability and also the necessity of preparing contingency plan for NICRA villages for the next Kharif season. Dr SK Mondal, Principal Scientist of ATARI stressed the need for focus in livestock related interventions. During the two days, the annual progress and the action plans for the forthcoming year of all the NICRA KVKs were discussed and finalised.

ICRA-TDC Annual Review Workshop of Zone-V KVKs

The annual review as well as action plan meeting of Technology Demonstration Component under ICAR-ATARI, Zone-V was organized at KVK Ahmednagar, Maharashtra from 3-4 May, 2016. The meeting was chaired by Dr. Y.G. Prasad, Director, ICAR-ATARI, Zone-V, and attended by Dr B.Vijayabhinandana, Dy Director of Extension, ANGRAU, Dr Rajender Reddy, Principal Scientist, & Nodal Officer (NICRA) and Dr JVNS Prasad, Principal Scientist, Director, ATARI emphasized the need for contingency planning and monsoon action plan for the coming season and the need for effective implementation. Dr. Vijayabhinandana spoke about successful interventions of the KVKs in Andhra Pradesh and Dr Rajender Reddy spoke about the need for focusing on interventions related to climatic vulnerability and effective use of soil health cards for mounting interventions in the village. Dr JVNS Prasad, Co-PI, TDC-NICRA (CRIDA), Hyderabad explained about the drought situation prevalent in the zone and the need for taking up of successful interventions in large scale. The progress report of the last year, action plan for the forthcoming season were presented.



NICRA-TDC Annual Review Workshop of Zone-III KVKs

NICRA annual review meeting on 'Technology Demonstration Component' of KVKs under ICAR-ATARI, Zone-III was organized at College of Veterinary Sciences, AAU Jorhat, Khanapara, Assam during May 6-7, 2016 under the chairmanship of Dr. Bidyut. C. Deka, Director, ICAR-ATARI, Zone-III, Umiam. Director, ATARI emphasized the need for systems approach for addressing climate vulnerability and to sustain the farm incomes in view of the resources of the region. Dr. P. C. Jat, Senior Scientist (Agro.) & Nodal Officer (NICRA) explained the significant outcomes of the project during the year. Dr. A. K. Gogoi, In-Charge, CCPRI Kahikuchi Assam, stressed on the importance of digitization of resources of the NICRA village and suggested resource based planning and mounting of interventions in the NICRA villages. Dr JVNS Prasad, Co-PI, TDC-NICRA (CRIDA), Hyderabad talked about



climate vulnerability of the region, expectations from the workshop and the need for up-scaling of the interventions in the NICRA village for larger impact.

NICRA Annual Review Workshop of Zone-VIII KVKs

NICRA review cum action plan workshop was held during 10-11th May, 2016 at ICAR-ATARI, Bengaluru. The meeting was chaired by Dr Sreenath Dixit, Director, ATARI, Bengaluru and attended Dr JVNS Prasad, Co-PI, TDC, NICRA, CRIDA Hyderabad, Dr DVS Reddy, Principal Scientist and nodal Scientist, NICRA, ATARI, Bengaluru and all the Heads of KVKs implementing NICRA of Zone-VIII. During this meeting eleven KVKs of Zone VIII namely, Chikkaballapura, Villupuram, Davangere, Alappuzha, Belagavi, Gadag, Tumkur, Nammakkal, Kalburagi, Ramanathapuram and Thiruvapur presented progress report of 2015-16 and also their action plan for the year 2016-17. In the inaugural speech, Director, ICAR-ATARI explained about the need for more systematic documentation and publication of work done by KVKs in Zone VIII.

NICRA-TDC Annual Review Workshop of Zone-VII KVKs

Annual review meeting on 'Technology Demonstration Component' of NICRA- KVKs under ICAR-ATARI, Zone-VII was organized at KVK Dewas, Madhya Pradesh during 12-13 May, 2016 under the chairmanship of Dr. Anupam Mishra, Director, ICAR-ATARI, Zone-VII, Jabalpur.

Dr SK Srivastava, Director, Extension Services, RVSKVV, Gwalior, Dr. SRK Singh, Senior Scientist & Nodal Officer (NICRA), Dr Bha-



dhoria, Dy Director, Extension, RVSKVV, Gwalior participated. Dr Mishra, stressed the importance of quantifying the impacts of rainfall during the cropping season and stressed the need to focus interventions as well as the data collection. Dr Srivastava spoke about the need for assessing the technologies for variable rainfall situations and narrated how the performance of soybean crop was influenced by variable rainfall in the last few years in Madhya Pradesh. Dr JVNS Prasad, Co-PI, TDC-NICRA (CRIDA), Hyderabad spoke about expectations from the workshop and the need for up-scaling of the interventions in the selected village for larger impact.

NICRA Annual Review Workshop of Zone-I KVKs

Annual Review Workshop of NICRA Krishi Vigyan Kendras of Ludhiana was held on 2nd June 2016. Dr. J. C. Dagar, Former ADG, NRM Division, ICAR, New Delhi, in his inaugural address. He ex-

plained the evolvement of the project particularly the Technology Demonstration Component and informed the house that climate change was a gradual process. All the heads of KVKs of Zone-I under NICRA presented Action Taken Report on the recommendations of last workshop of NICRA held during 02/05/2015 at ICAR-CSSRI, Karnal; Progress Report of 2015-16; and Action Plan for 2016-17. Detailed discussions were held during presentations and heads were advised to improve their Action Plan as per suggestions and submit them within 15 days. The farmers from NICRA village of Chamba (Shri Dharu Ram) and Yamunanagar (Shri Surender Kumar and Shri Vikrant Kamboj) shared their NICRA experiences and explained how things had changed after implementation of NICRA in their villages.

Interface Meeting of NICRA and National Water Mission

An Interface meeting of NICRA and National Water Mission was organized at CRIDA, Hyderabad on 6th May, 2016. Dr. M. Satyanarayana, IFS, Advisor (C&M), National Water Mission, New Delhi was the chief guest for this meeting. Dr. K. Sammi Reddy, Director (I/c), CRIDA presided over the meeting. Dr. M. Prabhakar, PI, NICRA along with Co-PIs of NICRA at CRIDA



actively participated in the interaction. Dr. G. Kar, Principal Scientist, IIWM, Bhubaneswar, Dr. K.V. Rao, Dr. K. Srinivasa Reddy and Dr. M. Osman, Principal Scientists CRIDA made presentations on respective water related activities being under taken in NICRA. A detailed discussion after each presentation lead to some action points for implementation.

NICRA-Expert Committee Meeting

Three day meeting of NICRA expert committee on sponsored and competitive grants projects was inaugurated by Dr. T. Mohapatra, Secretary (DARE) and DG (ICAR) on 14-6-2016 at NASC complex, New Delhi. The meeting was attended by Dr. S. M. Virmani, Chairman, Expert Committee, Members of the Committee, Dr. K. Alagusundaram, Dr. Joykrushna Jena, DDG (NRM and Engineering), Dr. N.K. Krishna Kumar, DDG (Horticulture), DDG (Fisheries), ADGs, and PI's of 27 projects short listed for funding under NICRA sponsored and competitive grants component. Dr. Mohapatra, in his inaugural address emphasized the significance of the NICRA program in bringing various Ministries, Institutes and stakeholders together. He highlighted the importance of contingency plans developed by ICAR and need for strengthening them and made suggestions towards implementation strategies in coordination with State and Central Governments.



News from AICRPs

Agromet Research Explicite Program (AREP)

AICRP on Agrometeorology (AICRPAM) conducted a ten-day in-service 'Agromet Research Explicite Program' (AREP) during 10-19 February at BCKV, Mohanpur (West Bengal). The program was attended by delegates from 22 State Agricultural Universities. Prof AK Chakravarti, Hon'ble Vice Chancellor, BCKV, who presided over the inaugural function, highlighted the importance of Agrometeorology in this era of climate change and extreme weather events. Dr VUM Rao, Project Coordinator (AICRPAM) gave a brief description of objectives of the program and achievements of AICRPAM. The program consisted of analysis of

extreme weather events, weather effects on pests and diseases, crop-weather relationship (radiation use efficiency in particular), soil-water relationships in irrigated and rainfed agriculture. After reviewing the current progress and considering the constraints and available resources, the road map for next five years was laid out for AICRPAM and targets were identified.



AICRPDA-TSP National Review Workshop

Two-day All India Coordinated Research Project for Dryland Agriculture -Tribal sub-plan (TSP) National Review Workshop was organized at AICRPDA centre, Arjia, MPUAT, Rajasthan during 1-2 March, 2016. Dr. Srinivasa Rao, chief guest of inaugural session, emphasized on creating NRM based physical assets in AICRPDA-TSP adopted villages such as farm ponds, livelihood interventions and capacity building activities that directly benefit individual tribal farmers/women or the community. Dr. Ameta in his welcome address suggested to demonstrate the simple and doable rainfed technologies/practices in TSP villages. Dr. Ravindra Chary briefed that the workshop was being held to review the TSP programme being implemented in 20 tribal villages in 7 states through 7 AICRPDA centres viz. Arjia (Rajasthan), Biswanath Chariali (Assam), Chianki (Jharkhand), Indore (Madhya Pradesh), Jagdalpur (Chhattisgarh), Phulbani (Odisha) and SK Nagar (Gujarat).



Annual Review Meeting of AICRPAM-NICRA

Annual review meeting of AICRPAM-NICRA-cum-Farmer's Initiative was held at CRIDA from 27 to 29 April 2016 to discuss



the role of agro advisories in the context of climate change impacts such as droughts, floods, cyclones, heat waves etc.

In his inaugural address, Dr. Ch. Srinivasa Rao, Director, CRIDA emphasized on the promotion of agro advisory to manage various weather aberrations and extreme climatic events and how to move forward for downsizing the agro advisories. In the review meeting all the 25 centers of the project presented the progress of the technical program executed.

For different technical sessions, Agromet scientists: Drs. Y. S. Ramakrishna, GGSN. Rao, NVK Chakravarty and GSLHV Prasada



Rao chaired and lead the discussions for improving the progress of implementation of the project on improving quality of agro advisories. During the farmers' interactive session eight farmers from Andhra Pradesh, Orissa, Karnataka, Kerala and Maharashtra gave their feedback on Agromet Advisory-Services (AAS) provided by the centres.

Fourth AICRPDA-NICRA Annual Review Workshop

The Fourth Annual review Workshop of All India Coordinated Research Project for Dryland Agriculture (AICRPDA)-National Innovations on Climate Resilient Agriculture(NICRA) was organized at AICRPDA centre, Kovilpatti, TNAU, Tamil Nadu during 3-6 May 2016. Dr. K. Ramasamy, Hon'ble Vice Chancellor,



Dr. M. Maheswaran, Director of Research, TNAU, Dr. G. Ravindra Chary, Project Coordinator (Dryland Research), Scientists from 23 main and 8 ORP centres of AICRPDA, CRIDA and TNAU and farmers from NICRA village participated. During the inaugural session on 3rd May 2016, Dr. Ravindra Chary briefed that the aim of the workshop was to review the progress during 2015-16, impact of real-time contingency measures implementation during 2011-15 in 33 AICRPDA-NICRA adopted villages to cope with weather aberrations and finalize technical programme for 2016-17. Dr. Maheswaran suggested to take up research on developing practices to address climate variability impacts on agriculture production. During Plenary session, chief guest Dr. K. Ramasamy, VC, TNAU, emphasized on blending the traditional knowledge and modern science knowledge and tools to address the impacts of weather aberrations in Indian agriculture. The major recommendation of the workshop was to update and validate district agriculture contingency plans on real-time basis in 23 NICRA adopted villages in 15 states. The technical programme was finalized for 23 AICRPDA-NICRA centres. During the occasion 14 publications from Project Coordination Unit and centres of AICRPDA were released. Three Best Dryland Farmers from NICRA village in Thoothukkudi district were felicitated.

Orientation and Technical Workshop of New Voluntary Centres of AICRPDA

Two-day Orientation and Technical Workshop of 5 New Voluntary Centres of All India Coordinated Research Project for Dryland Agriculture (AICRPDA) under CAU, Imphal, Manipur; BAU, Sabour, Bihar; AU, Kota, Rajasthan; ANGRAU, Andhra Pradesh; and UAS, Raichur, Karnataka, was held at ICAR-CRIDA during



8-9 June 2016. The objective of the workshop was to sensitize new centres about the mandate and activities of CRIDA and AICRPDA, and further to develop technical programme of 2016-17 for new centres to implement in the ensuing kharif 2016. In the

inaugural session, Chief Guest Dr. S. Bhaskar, ADG (AAF&CC), NRM Division suggested the new voluntary centres to prioritize the rainfed agriculture problems in the domain of the centre and accordingly initiate two or three focused experiments as problem solving research. Dr. Srinivasa Rao, Director CRIDA highlighted the problems of rainfed agriculture and research priorities of CRIDA-AICRPDA and advised the new centres to undertake resource characterization of the resource domain of the centre for initiating location-specific rainfed agriculture research a publication on “Improved Agronomic Practices for Rainfed Crops in India” from AICRPDA, PC Unit was released. To orient the new centres, five relevant AICRPDA centres viz. Arjia, Bijapur, Anantapur, Biswanath Chariyal and Chianki made detailed presentation on research focus, achievements, doable rainfed technologies, research collaboration, programmes and linkages in technology dissemination.

Participation in Meetings/Seminars/Symposia

Name of the Scientist	Workshop/Meeting/Seminar/Symposia	Duration	Venue
Er. Nagarjuna Kumar	International Seminar on 'Indigenous Technologies for Sustainable Agriculture and Better Tomorrow'	January 09-10, 2016	CSRI-NBRI, Lucknow
	Fourth National Knowledge Network (NKN) workshop	January 21-22, 2016	JNTU, Hyderabad
Dr. C.A. Rama Rao	National level seminar on 'Role of public governance in arena of climate change for agriculture and allied sector-issues and way forward'	February 6, 2016	Mumbai University, Mumbai
Dr. S. Desai, Dr. BMK. Raju, Dr. K. Nagasree, Er. Nagarjuna Kumar, Ms. Pushpanjali.	National Symposium on Organic Farming for Farmers' Prosperity	March 19-20, 2016	NIRD & PR Hyderabad

Important Visitors

Visit of Dr. Trilochan Mohapatra, Secretary, DARE and Director General, ICAR

Secretary, DARE and Director General, ICAR, Dr. Trilochan Mohapatra visited CRIDA on 25th March. He visited Phenomics Facility established under NICRA project and Dryland Gallery which showcases the salient scientific achievements of the Institute.

Dr. Ch. Srinivasa Rao, Director, CRIDA welcomed Dr. T. Mohapatra, Hon'ble Secretary, DARE and Director General, ICAR and explained the achievements of the Institute. Addressing the staff of CRIDA, Dr Mohapatra appreciated the contributions and the role played by CRIDA in developing various technologies for enhancing productivity and profitability in rainfed agricultural production systems. He assured that from Council's side, all support will be



extended to the Institute in the implementation of the research activities towards achieving the goals.



DG visit to CRIDA

S.No	Date	Visitors	Host
1	06-01-2016	Students and Faculty of University of Wisconsin, Platteville	CRIDA
2	07-01-2016	Senior Officers of Ministry of Agriculture & Farmers Welfare from MANAGE	CRIDA
3	03-02-2016	Shri Jalaj Srivastava, Additional Secretary, Ministry of Agriculture & Farmers Welfare	CRIDA
4	04-02-2016	Senior Officers of Ministry of Agriculture & Farmers Welfare from MANAGE	CRIDA
5	18-02-2016	Senior Officers of Ministry of Agriculture & Farmers Welfare from MANAGE	CRIDA
6	29-03-2016	ARS probationers of 103 Foundation Course for Agricultural Research Service (FOCARS-103), NAARM	CRIDA

Visits Abroad

- Dr. G. Nirmala, Principal Scientist & Head TOT** visited the Netherlands during 6-24 June, 2016 to attend the International Course on monitoring, evaluation and impact assessment of food and nutrition security programme at CDI, Wageningen, Netherlands.



- Participation in UNFCCC-Climate Change Negotiations in Agriculture Sector at SBSTA-44, Bonn, Germany**
 Dr. Ch. Srinivasa Rao, Director, ICAR-CRIDA, Indian delegation member participated in Climate change negotiations held at UNFCC-SBSTA-44 held at Bonn, Germany during May 16-26, 2016, focused mainly on evolving strategies to implement the Paris agreement. He made a presentation on technologies and practices towards



adaptation of Indian agriculture based on National Innovations in Climate Resilient Agriculture (NICRA) experiences and how these technologies are being implemented in large scale under various national programs. This session also discussed on reports finalized on two such sessions held last year on early warning systems and contingency plans and risk and vulnerability of agriculture systems. Overall stand of India on agriculture sector was towards adaptive agriculture in the context of food security and vulnerability of sub-sectors of agriculture such as field crops, horticulture, livestock, poultry, fishery, etc. to variability of extreme climatic events. Two in-session workshops held in this conference covered on adaptation measures and technologies towards climate resilient agriculture.



Human Resource Development

Model Training Course

A Model Training Course on “Efficient Soil Management Techniques for Minimizing Climate Change Impacts in Rainfed Areas”, sponsored by Directorate of Extension, Ministry of Agriculture, was organized by ICAR-CRIDA from 2-9 February, 2016. The trainees were addressed by Dr. Ch. Srinivasa Rao, Director, CRIDA during inaugural session followed by his presentation on On-farm generation of Soil Organic Matter for Soil Health Improvement and Crop Productivity. The valedictory session was held on 9th February, 2016 and was graced by chief guest, Dr. S. K. Singh, Director, ICAR-NBSS & LUP, Nagpur. He spoke about the efficient soil management practices in agriculture and the need to prevent soil erosion and degradation. A compendium entitled “Efficient Soil



Management Techniques for Minimizing Climate Change Impacts in Rainfed Areas” was released on this occasion. The training curriculum emphasized on conservation agriculture nutrient management strategies for minimizing drought, soil quality management for carbon sequestration strategies, use of polymers for improving water and fertilizer use efficiency and participatory soil management techniques in rainfed agriculture.

Training Programme on "Micro Irrigation and Fertigation"

ICAR-CRIDA KVK organized a three day training program on Micro Irrigation and Fertigation to farmers of Ranga Reddy district. About 30 farmers from Gaddamallaiahguda village, Yacharam Mandal participated in the program. Dr. B. Babu, Project Director of TSMIP was the chief guest for the inaugural day. The training was aimed at increasing water use efficiency by using micro irrigation systems like In-line drip irrigation, On-line drip irrigation, Sprinkler irrigation, Micro sprinkler irrigation, Rainguns and Foggers. Acid treatment equipment, Fertigation equipment and others related issues were covered during the three day training from 17-19 February, 2016.



On the concluding day, demonstrations were arranged in KVK watershed area on managing the pressure, scheduling irrigation to different crops, fertigation dosage, acid treatment process and maintenance procedures for all the parts of micro irrigation system.

Training cum Awareness on "Protection of Plant Varieties and Farmers Rights Act"

ICAR-CRIDA- KVK, Ranga Reddy District organized a one day program for creating awareness among the farmers on provisions of Protection of Plant Varieties and Farmers' Rights Act, 2001 on 27 February 2016 at Harshaguda village, Maheswaram division covering three mandals viz., Maheswaram, Kandukur and Saroomnagar. About 143 farmers, 3 village Sarpanch, Public representatives and extension officials from Department of Agriculture, Government of Telangana participated in the program. Dr. M. Prabhakar, Principal Scientist and Head, KVK-Ranga Reddy Dt., ICAR-CRIDA presided over the meeting. He briefed about the objectives of the training program. Dr. B. Sarath Babu, Officer In-charge, ICAR-NBPGR, Regional Station, Hyderabad was the Chief Guest. He narrated in detail about various provisions of the act with some case studies. Sh. Ch. Rudra Murthy, ADA, Maheswaram was the special invitee. He presented a brief picture on the farming situation of the three mandals. Dr. B. Sarkar, Principal Scientist (Plant Breeding), ICAR-CRIDA also enlightened the importance of protection of plant varieties to the farmers. Farmers were advised to register their own varieties. A revised brochure in local language (Telugu) on the “Protection of Plant Varieties and Farmers' Rights Act 2001” covering 102 crops was brought out and distributed to the farmers as resource material along with training kit. This training was sponsored by the Protection of Plant Varieties and Farmers' Rights Authority (PPVFRA), Ministry of Agriculture, New Delhi in association with ATARI, Zone-V, Hyderabad.

Forthcoming Events

S.No	Title of the event	Duration
1	Training program on “Agrometeorological data collection, analysis and management”	July 25-06 August, 2016
2	Brain Storming Session on Policy Framing for Up-scaling Custom Hiring Centres (Farm Implements) in India	October 17, 2016
3	ICAR Short Course on "Reshaping Agricultural and Nutrition Linkages-Food and Nutrition Security"	November 17-26, 2016

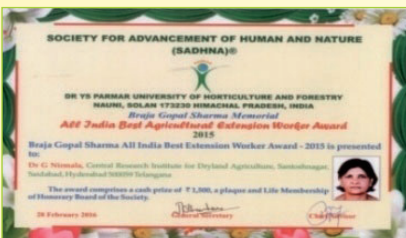
For details please visit the: www.crida.in

Awards and Recognition

Er. R. Nagarjuna Kumar, Scientist received **Excellence in Research-2015 award** from the Samagra Vikas Welfare Society (SVWS) in International Seminar entitled “Indigenous Technologies for Sustainable Agriculture and Better Tomorrow” during 09-10 January, 2016 held at CSRI-NBRI, Lucknow for the best work done in the field of computer applications in agriculture.



Dr. G. Nirmala (Principal Scientist) received **Braja Gopal Sharma award for All India Best Extension Worker-2015**, during 28th February, 2016 instituted by Society for Advancement of Human and Nature (SADHNA): A chapter of Y S Parmar University of Horticulture and Forestry, Solan, Himachal Pradesh.



ICAR- CRIDA received **Regional Rajbhasha Award 2015** of Ministry of Home Affairs, Govt. of India for best implementation of Rajbhasha in the Institute in terms of technical communications and official work of the Institute at Kochi on 19.02.2016.



Er. R. Nagarjuna Kumar, Scientist, was conferred with **Outstanding Achievement Award** for best work done in the field of computer applications in agriculture in National Conference on Agricultural and Rural Innovations for Sustainable Empowerment (ARISE-2016) during 21-22 May, 2016 held at Kakatiya University, Warangal, Telangana organized by S&T SIRI Organization.



Personnel Information

New Entrants/Appointments/Promotions/Transfers

Name	Transferred/Joined/ Promoted/Appointed	Date w.e.f.
Shri. A. Srinivasa Murthy, Sr. Finance & Accounts Officer	Transferred from IIHR, Bengaluru	01-01-2016
Dr. Minakshi Grover, Sr. Scientist (Microbiology)	Transferred to I.A.R.I., New Delhi	23-03-2016
Shri. D. Ashish Satish, Scientist (Farm Machinery & Power)	Appointed in CRIDA	11-04-2016
Dr. M. Manjunath, Scientist (Agril. Microbiology)	Transferred from IIVR, Varanasi	20-05-2016
Shri. B.D. Phansal, Chief Administrative Officer	Transferred from NAARM, Hyderabad	07-06-2016
Promotions		
Smt. Pushpanjali	Scientist - Promoted to next higher pay	07-01-2013
Dr. B.M.K. Raju	Sr. Scientist - Principal Scientist	21-08-2014
Dr. K.A. Gopinath	Sr. Scientist - Principal Scientist	29-08-2014
Dr. K. Rejani	Sr. Scientist - Promoted to next higher pay	30-08-2014
Dr. K. Ravi Shankar	Sr. Scientist - Principal Scientist	10-11-2014
Dr. N. Ravi Kumar	Sr. Scientist - Principal Scientist	22-11-2014
Dr. Sridevi Shankar	Sr. Scientist - Principal Scientist	26-11--2014

CRIDA extends best wishes to them

Retirements

Name	Designation	Date of superannuation
Dr A. Girija	CTO	31.03.2016
Shri. Jangaiah	SSS	31.03.2016
Dr. V. Uma Maheswara Rao	PC, AICRPAM	30.04.2016
Dr. M. Satya Prasad	Head, TOT	30.04.2016
Shri. P. Yadagiri	Technical Officer	30.06.2016

Our best wishes to them for happy and peaceful retired life

Cultural and Welfare Activities

Republic Day

CRIDA celebrated 67th Republic Day on January 26, 2016 with enthusiasm and gaiety. Director hoisted the National Flag and addressed the gathering. On the occasion, CRIDA employees who completed 25 years of service were honored with certificates by the Director. He motivated the staff with his message to work with dedication and boost institute's growth on progressive path.



Implementation of Swachhata Pakhwara Programme

As part of Swachhata Pakhwara Programme Mission, the staff of ICAR-CRIDA undertook cleaning at CRIDA main campus, Hayathnagar Research Farm (HRF), and Gunegal Research Farm (GRF) premises. The garbage was collected, segregated into two parts. The biodegradable wastes were dumped in the compost pits. The non-biodegradable waste was disposed off.

Quiz programme on the occasion of 88th Birthday Celebrations of Late Dr. M.V. Rao

As a part of the celebrations of the birthday on 21st June, of Late Padmashri Dr. M.V. Rao, ICAR-CRIDA & National Academy of Agricultural Sciences – Hyderabad Chapter jointly organized a quiz program on 18.06.2016 for students of class X at CRIDA, Hyderabad. The quiz competition had rounds on General Science, General Knowledge and Agriculture sections. The teams from Bhashyam Public School, Dilsukhnagar; Slate The School, Karmanghat and Sri Chaitanya Techno School, L. B. Nagar won the 1st, 2nd and 3rd prizes respectively. The Chief Guest Dr. Ch. Srinivasa Rao distributed the participation certificates to the participants. In his address, the Chief Guest advised the bright students to choose agriculture science as a career option. The trophy and prizes were distributed to the winners during Late Dr M. V. Rao's Birthday celebrations held at PJTSAU, Rajendranagar on 21st June 2016.

Sl.No.	Venue	Date
1	CRIDA Campus	16,19,23,28 May 2016
2	HRF	17,20,14,26 May 2016
3	GRF	18,21,25,27 May 2016

International Day of Yoga

The 2nd International Day of Yoga was celebrated in ICAR-CRIDA on 21st June, 2016. To initiate staff and research scholars in yoga practices, the Isha Foundation sent volunteers to teach Upa Yoga, a subset of yoga designed by Sadhguru Jaggi Vasudev. Over 124 members of staff of CRIDA actively participated in a 2-hr session starting from 10 am onwards at the campus. The Upa Yoga postures are devised to give health, success, peace, wellbeing, joy, inner exploration and love. The seven sets of practices devised for increasing agility, strength in limbs, correction of posture of spinal cord, lumbar region, etc., were demonstrated to the participants.



खरीफ 2016 का मौसम पूर्वानुमान एवं कृषि क्षेत्र की तैयारी

भारतीय मौसमविज्ञान विभाग (IMD) ने इस वर्ष के दक्षिण-पश्चिम मानसून के बारे में अपने प्रथम पूर्वानुमान में यह स्पष्ट किया कि पूरे भारत में वर्षा की संभावना साधारण से अधिक है अर्थात् यह लंबी अवधि के सामान्य औसत के लगभग 106 प्रतिशत तक रहेगी। अन्य अंतर्राष्ट्रीय एजेंसियों जैसेकि एसएसीओएफ (South Asia Climate Outlook Forum) ने भी ऐसा ही पूर्वानुमान व्यक्त किया है। मौसम पूर्वानुमान से ज्ञात हुआ कि मानसून के दौरान महाराष्ट्र, गुजरात, राजस्थान एवं मध्य प्रदेश के पश्चिमी क्षेत्र में वर्षा साधारण से अधिक हो सकती है। पूर्वी एवं उत्तर पूर्वी राज्यों जैसेकि बिहार, झारखंड, ओडिशा, पश्चिम बंगाल, असम एवं अन्य उत्तर पूर्वी राज्यों में वर्षा साधारण से कम हो सकती है। दक्षिण भारत के राज्यों यानि आंध्र प्रदेश, तेलंगाना, कर्नाटक में साधारण जबकि तमिलनाडु में औसत वर्षा साधारण से कम होने की संभावना व्यक्त की गई। मध्यम वर्षा वाले क्षेत्रों में साधारण से अधिक वर्षा खाद्यान्न उत्पादन में बढ़ोतरी का अवसर प्रदान करती है लेकिन तीव्र वर्षा, जो अस्थायी बाढ़ का कारण भी बन सकती है, की घटनाओं से जूझने के लिए काफी तैयारी करने की आवश्यकता है। दूसरी तरफ मध्यम से अधिक वर्षा वाले क्षेत्रों में, साधारण वर्षा की परिस्थितियों में, जहां वर्षा आधारित चावल एक मुख्य फसल है, वहां मध्य मौसमावधि में देर से आने वाले सूखे से बचने के लिए पर्याप्त तैयारियों की आवश्यकता है।

विभिन्न राज्यों द्वारा की जा रही तैयारियों में गति लाने के लिए भाकृअनुप-क्रीडा ने कृषि एवं किसान कल्याण मंत्रालय के सहयोग से 'मानसून मौसम से पहले किए जाने वाले उपायों की तैयारियों एवं भूमि पर सही समय की आकस्मिक योजनाएं बनाना' नामक विषय पर अप्रैल से जून 2016 के दौरान 12 राज्यों के राज्य कृषि विभागों के साथ इंटरफेस बैठकें आयोजित की। मुझे यह सूचित करते हुए खुशी हो रही है कि देश के कुल 614 जिलों के लिए कृषि आकस्मिक योजनाएं बनाई गई हैं तथा इन योजनाओं को कृषि एवं किसान कल्याण मंत्रालय सहित भाकृअनुप एवं क्रीडा के वेबसाइटों पर उपलब्ध कराया गया है। इन योजनाओं को हमारे वेबसाइट से डाउनलोड कर सकते हैं।

सीएच. श्रीनिवास राव
निदेशक, क्रीडा

Published by : Dr. Ch. Srinivasa Rao, Director, CRIDA
Editorial Board
Chairman : Dr. Ch. Srinivasa Rao, Director, CRIDA
Editors : Dr. K. Srinivas, Pr. Scientist, DRM
: Dr. (Mrs.) K. Nagasree, Sr. Scientist, TOT
: Dr. K. Ravi Shankar, Pr. Scientist, TOT
Hindi Translation : Dr.S.R.Yadav, A.D (OL) & Shri. G. Prabhakar, STO
Photo credits : Mr. K. Surender Rao, CTO



केंद्रीय बारानी कृषि अनुसंधान संस्थान
Central Research Institute for Dryland Agriculture



संतोषनगर, सैदाबाद, हैदराबाद - 500 059
Santoshnagar, Saidabad PO, Hyderabad - 500 059
Ph: 040-24530157/161/163 Fax:040-24531802
E-mail: headtot@crida.in Website: www.crida.in



Monsoon forecast for Kharif 2016 & Preparedness for Agriculture Sector

The India meteorological Department (IMD) in its first forecast for this South West Monsoon indicated that the rainfall over All India is expected to be Above Normal i.e. about 106% of long period average. Other international agencies such as SASCOF-8 (South Asia Climate Outlook Forum) also made similar forecasts. The forecast also indicated that Western Region comprising states of Maharashtra, Gujarat, Rajasthan & Madhya Pradesh might receive above normal rainfall during the season while Eastern & North eastern states i.e. Bihar, Jharkhand, Odisha, West Bengal, Assam & other North East states might receive below normal rainfall. States in South India i.e. Andhra Pradesh, Telangana, Karnataka might receive normal rainfall while the average rainfall over Tamilnadu is expected to be below normal. Above normal rainfall in medium rainfall zones gives an opportunity to enhance the foodgrain production but also calls for preparedness to tackle high intensity rainfall events which may cause temporary flooding. On the other hand, in below normal rainfall scenario in medium to high rainfall zones where rainfed rice is the predominant crop, adequate measures need to be taken up to deal with mid season and late season droughts.

In order to enhance the preparedness of different states, ICAR, CRIDA along with Ministry of Agriculture and Farmers Welfare organized interface meetings with State Department of Agriculture covering 12 states during the months of April to June 2016 on preparedness measures to be taken up before this monsoon season and real time contingency measures to be adopted. I am happy to inform that a total of 614 District Agriculture Contingency Plans have been prepared and are available on MoA&FW, ICAR & CRIDA websites and can be accessed by stakeholders.

Ch. Srinivasa Rao
Director, CRIDA

BOOK-POST

To
