



Shri Ranglal Jamuda, IAS, Special Secretary, DAC, MoA, Govt. of India and Chief Guest of the function addressing the audience

Dr. T Mohapatra, Director and Chairman highlighted the significant achievements of the institute, specially the recently released varieties and their suitability for diverse ecologies. He spoke on the objectives of the programme, inspired the farmers and summarized the suggestions for taking further actions.

The technical session included presentations on i) rice varieties for varied ecologies and adverse situations; ii) problem soils and their management; iii) new practices of crop protection technology; iv) quality aspects of rice for remunerative market price; and v) socio-economic and development issues in rice. The innovative/progressive farmers presented their views, innovative experiences and difficulties faced by them in agriculture. The Deputy Directors of Agriculture (DDAs) and other Agriculture Officers also shared their view points, followed by a lively and fruitful interactive session by scientists-farmers-extension officers. The Chief Guest felicitated 32 innovative rice farmers from all the districts on the occasion with trophy and certificate. Three extension bulletins on 'CRRRI rice varieties for diverse ecologies', 'Rice nematodes and their management', and 'Agro-



Dr. PK Meherda, IAS, Commissioner-cum-Director, Dept. of Agriculture and Food Production, Govt. of Odisha and Guest of Honour speaking on the occasion

The technical session included presentations on i) rice varieties for varied ecologies and adverse situations; ii) problem soils and their management; iii) new practices of crop protection technology; iv) quality aspects of rice for remunerative market price; and v) socio-economic and development issues in rice. The innovative/progressive farmers presented their views, innovative experiences and difficulties faced by them in agriculture. The Deputy Directors of Agriculture (DDAs) and other Agriculture Officers also shared their view points, followed by a lively and fruitful interactive session by scientists-farmers-extension officers. The Chief Guest felicitated 32 innovative rice farmers from all the districts on the occasion with trophy and certificate. Three extension bulletins on 'CRRRI rice varieties for diverse ecologies', 'Rice nematodes and their management', and 'Agro-



A farmer visiting the exhibition stall



An innovative farmer being awarded by the Chief Guest

climatic characterization for crop planning in water stress prone area of Ganjam' were released by the dignitaries. An exhibition displaying CRRI technologies and implements was also organized on the occasion. Dr. BN Sadangi welcomed the guests and dignitaries and Dr. Amal Ghosh offered the vote of thanks, while Dr. Lipi Das and Dr. SK Mishra coordinated the programme.

Institute Management Committee Meeting

The XXVIIth Institute Management Committee (IMC) meeting of the CRRI was held on 31 January 2015 at Cuttack under the Chairmanship of Dr. T Mohapatra, Director, CRRI. The members present were Dr. (Mrs) N Sarala, National Professor, DRR, Hyderabad, Dr. PK Das, Dean of Research, OUAT, Bhubaneswar, Dr. SG Sharama, Head, Crop Physiology and Biochemistry Division, CRRI, Shri NVRN Murty, Finance & Accounts Officer, CIFA, Bhubaneswar, Shri UK Parida and Shri Kulamani Rout, Ex-MLA, Bari-Derabish, Kendrapara. Dr. BN Sadangi, Head, Social Science Division, CRRI, Dr. ON Singh, Head, Crop Improvement Division, CRRI, Dr. (Mrs) U Dhua, Head(I/c), Crop Protection Division, CRRI, Shri SR Khuntia, Chief Finance & Accounts Officer, CRRI and Shri BK Sinha, Senior Administrative Officer, CRRI as Member Secretary also attended the meeting. Matters related to infrastructure development and budgetary provisions for construction works and production of seeds of CRRI varieties in farmers' field were discussed.



IMC meeting in progress

Workshop on Rice Production

The institute organized a "Workshop on Rice Production" on 6 March 2015 at the 'Institute for Management of Agricultural Extension' (IMAGE), Bhubaneswar in the side line of the state "Krishi Mahotsav" celebrated from 5 to 8 March 2015 at Bhubaneswar. The workshop was attended by over hundred rice farmers from various districts of Odisha, apart from fifty state Agriculture Officers and scientists from CRRI. The main objective of the workshop was to understand their problems in rice production and suggest recommendations. The workshop was inaugurated by Dr. T Mohapatra, Director, CRRI and Shri A Sethi, Director, IMAGE. Addressing the gathering in the opening session, Shri Sethi said that the workshop is an excellent platform to bridge the existing information gap in order to empower the ultimate users, i.e., "farmers". Dr. T Mohapatra,

...ମୁଖ୍ୟ ଅତିଥିମାନଙ୍କଦ୍ୱାରା 'ଜଗନ୍ନାଥ ଜିଲ୍ଲା'ର ଜଳାଭରଣ ନୀତି (ଅନୁପାଳନ ଓ ଶାସନ) ବିଷୟରେ ବିବରଣ ଦିଆଯାଇଥିଲା ଏବଂ ଗ୍ରାମୀଣମାନଙ୍କୁ କୃଷି ଉପରେ ଉତ୍ସାହ ଦେବା ପାଇଁ ପ୍ରୋତ୍ସାହନ ଦିଆଯାଇଥିଲା। ଉପସ୍ଥିତ ଅତିଥିମାନଙ୍କ ମଧ୍ୟରୁ ଡା. ଏ. ଘୋଷ, ଡା. ଲିପି ଦାଶ ଏବଂ ଡା. ସ. କ. ମିଶ୍ର ଆଦି ଥିଲେ।

ଓଡ଼ିଶା ବିଶ୍ୱବିଦ୍ୟାଳୟରେ ଉପସ୍ଥିତି

ଓଡ଼ିଶା ବିଶ୍ୱବିଦ୍ୟାଳୟରେ ଉପସ୍ଥିତି ମଧ୍ୟ ୨୮ ଓ ୩୧ ଜାନୁଆରୀ ୨୦୧୫ ମସିହାରେ ଘଟୁଥିଲା। ଉପସ୍ଥିତିରେ ବିଭିନ୍ନ ବିଭାଗର ଅଧିକାରୀଙ୍କ ସହିତ କର୍ମଚାରୀମାନଙ୍କର କାର୍ଯ୍ୟକ୍ରମ ଆଲୋଚନା କରାଯାଇଥିଲା ଏବଂ ବିଭିନ୍ନ ବିଭାଗର ଅଧିକାରୀଙ୍କୁ କାର୍ଯ୍ୟକ୍ରମରେ ଉପସ୍ଥିତ ରଖିବାକୁ ପ୍ରୋତ୍ସାହନ ଦିଆଯାଇଥିଲା। ଉପସ୍ଥିତିରେ ବିଭିନ୍ନ ବିଭାଗର ଅଧିକାରୀଙ୍କ ମଧ୍ୟରେ କାର୍ଯ୍ୟକ୍ରମ ଆଲୋଚନା କରାଯାଇଥିଲା ଏବଂ ବିଭିନ୍ନ ବିଭାଗର ଅଧିକାରୀଙ୍କୁ କାର୍ଯ୍ୟକ୍ରମରେ ଉପସ୍ଥିତ ରଖିବାକୁ ପ୍ରୋତ୍ସାହନ ଦିଆଯାଇଥିଲା। ଉପସ୍ଥିତିରେ ବିଭିନ୍ନ ବିଭାଗର ଅଧିକାରୀଙ୍କ ମଧ୍ୟରେ କାର୍ଯ୍ୟକ୍ରମ ଆଲୋଚନା କରାଯାଇଥିଲା ଏବଂ ବିଭିନ୍ନ ବିଭାଗର ଅଧିକାରୀଙ୍କୁ କାର୍ଯ୍ୟକ୍ରମରେ ଉପସ୍ଥିତ ରଖିବାକୁ ପ୍ରୋତ୍ସାହନ ଦିଆଯାଇଥିଲା।

ଓଡ଼ିଶା ବିଶ୍ୱବିଦ୍ୟାଳୟରେ ଉପସ୍ଥିତି

ଓଡ଼ିଶା ବିଶ୍ୱବିଦ୍ୟାଳୟରେ ଉପସ୍ଥିତି ମଧ୍ୟ ୨୮ ଓ ୩୧ ଜାନୁଆରୀ ୨୦୧୫ ମସିହାରେ ଘଟୁଥିଲା। ଉପସ୍ଥିତିରେ ବିଭିନ୍ନ ବିଭାଗର ଅଧିକାରୀଙ୍କ ସହିତ କର୍ମଚାରୀମାନଙ୍କର କାର୍ଯ୍ୟକ୍ରମ ଆଲୋଚନା କରାଯାଇଥିଲା ଏବଂ ବିଭିନ୍ନ ବିଭାଗର ଅଧିକାରୀଙ୍କୁ କାର୍ଯ୍ୟକ୍ରମରେ ଉପସ୍ଥିତ ରଖିବାକୁ ପ୍ରୋତ୍ସାହନ ଦିଆଯାଇଥିଲା। ଉପସ୍ଥିତିରେ ବିଭିନ୍ନ ବିଭାଗର ଅଧିକାରୀଙ୍କ ମଧ୍ୟରେ କାର୍ଯ୍ୟକ୍ରମ ଆଲୋଚନା କରାଯାଇଥିଲା ଏବଂ ବିଭିନ୍ନ ବିଭାଗର ଅଧିକାରୀଙ୍କୁ କାର୍ଯ୍ୟକ୍ରମରେ ଉପସ୍ଥିତ ରଖିବାକୁ ପ୍ରୋତ୍ସାହନ ଦିଆଯାଇଥିଲା। ଉପସ୍ଥିତିରେ ବିଭିନ୍ନ ବିଭାଗର ଅଧିକାରୀଙ୍କ ମଧ୍ୟରେ କାର୍ଯ୍ୟକ୍ରମ ଆଲୋଚନା କରାଯାଇଥିଲା ଏବଂ ବିଭିନ୍ନ ବିଭାଗର ଅଧିକାରୀଙ୍କୁ କାର୍ଯ୍ୟକ୍ରମରେ ଉପସ୍ଥିତ ରଖିବାକୁ ପ୍ରୋତ୍ସାହନ ଦିଆଯାଇଥିଲା।

Director and Chairman emphasized on 'crop diversification' in view of the frequent natural disasters like drought, cyclone and flood being received by the state almost every year.

The technical session deliberations by CRRI scientists Drs. AK Nayak, U Dhua, PC Mohapatra, SK Pradhan and SD Mohapatara were followed by "Scientists-Farmers-Extension Officers" interaction on problems and issues concerning rice production. The major concerns raised were on supply of quality seeds in time, irrigation infrastructure, establishment of rubber sheller in each block and waiving of electricity charges in farming operations. The Director distributed ten 2-kg paddy seed mini kits of eight newly released CRRI varieties suitable for various rice ecologies to the Deputy Directors of Agriculture (DDAs)/their representatives of the state for demonstration. The workshop was coordinated by Dr. BN Sadangi, Head, Social Science Division and Dr. SK Mishra, Senior Scientist.



Guests on the Dais listening to the participants

CRRI-NABARD Interaction Meet

A CRRI-NABARD Interaction-cum-Exposure Meet was organized on 26 March 2015 in the institute in collaboration with NABARD Regional Office, Bhubaneswar, which was attended by four DGMs, over thirty District Development Managers-cum-AGMs (DDMs/AGMs) of NABARD from Odisha, all HODs and scientists of the institute. Shri SK Kale, CGM, NABARD, Bhubaneswar in his presidential address highlighted the activities and achievements of NABARD in augmenting



Shri SK Kale, CGM, NABARD, Bhubaneswar speaking on the occasion



NABARD officials visiting the Farming System Models of the Institute

ଅନୁଷ୍ଠାନର ସମସ୍ତ ସଭ୍ୟମାନଙ୍କର ସମ୍ମୁଖରେ ଏହି କାର୍ଯ୍ୟକ୍ରମର ବିବରଣୀ ପ୍ରଦାନ କରାଯାଇଥିଲା। ଏହାଛଡ଼ା, ବିଭିନ୍ନ ପ୍ରକାରର ପରିସ୍ଥିତିରେ ଚାଷ କରିବା ପାଇଁ ଉପଯୁକ୍ତ ଉପାଦାନ ଉପରେ ଆଲୋଚନା କରାଯାଇଥିଲା।

ଏହାଛଡ଼ା, ବିଭିନ୍ନ ପ୍ରକାରର ପରିସ୍ଥିତିରେ ଚାଷ କରିବା ପାଇଁ ଉପଯୁକ୍ତ ଉପାଦାନ ଉପରେ ଆଲୋଚନା କରାଯାଇଥିଲା। ଏହାଛଡ଼ା, ବିଭିନ୍ନ ପ୍ରକାରର ପରିସ୍ଥିତିରେ ଚାଷ କରିବା ପାଇଁ ଉପଯୁକ୍ତ ଉପାଦାନ ଉପରେ ଆଲୋଚନା କରାଯାଇଥିଲା।

ଏହାଛଡ଼ା, ବିଭିନ୍ନ ପ୍ରକାରର ପରିସ୍ଥିତିରେ ଚାଷ କରିବା ପାଇଁ ଉପଯୁକ୍ତ ଉପାଦାନ ଉପରେ ଆଲୋଚନା କରାଯାଇଥିଲା। ଏହାଛଡ଼ା, ବିଭିନ୍ନ ପ୍ରକାରର ପରିସ୍ଥିତିରେ ଚାଷ କରିବା ପାଇଁ ଉପଯୁକ୍ତ ଉପାଦାନ ଉପରେ ଆଲୋଚନା କରାଯାଇଥିଲା।

ଏହାଛଡ଼ା, ବିଭିନ୍ନ ପ୍ରକାରର ପରିସ୍ଥିତିରେ ଚାଷ କରିବା ପାଇଁ ଉପଯୁକ୍ତ ଉପାଦାନ ଉପରେ ଆଲୋଚନା କରାଯାଇଥିଲା

ଏହାଛଡ଼ା, ବିଭିନ୍ନ ପ୍ରକାରର ପରିସ୍ଥିତିରେ ଚାଷ କରିବା ପାଇଁ ଉପଯୁକ୍ତ ଉପାଦାନ ଉପରେ ଆଲୋଚନା କରାଯାଇଥିଲା। ଏହାଛଡ଼ା, ବିଭିନ୍ନ ପ୍ରକାରର ପରିସ୍ଥିତିରେ ଚାଷ କରିବା ପାଇଁ ଉପଯୁକ୍ତ ଉପାଦାନ ଉପରେ ଆଲୋଚନା କରାଯାଇଥିଲା।



agricultural production in the state through its credit support in rural sector, promotional activities, regulatory roles and supervisory mechanisms. Gracing the occasion as the Chief Guest and inaugurating the meet, Director, CRRl Dr. T Mohapatra said that rice is core to the development of the country, more so in eastern parts of the country and particularly in Odisha. He emphasized on NABARD's role in farm mechanization, custom hiring, and value-chain establishment. All the HODs presented a brief account of disseminable technologies on rice for the benefit of the NABARD officials. In afternoon, the officials visited the research farm including three rice-based farming system models developed by the institute. The programme was coordinated by Dr. BN Sadangi, Head, Social Science Division and Dr. SK Mishra, Senior Scientist.

Exhibition

CRRl participated in the 'Global Social Science Conference-2015' on "Management of Sustainable Livelihood Systems" jointly organized by International Society of Extension Education (INSSE), Nagpur, Odisha Society of Extension Education (OSSE), Bhubaneswar and Orissa University of Agriculture and Technology (OUAT) at OUAT, Bhubaneswar from 14 to 17 February 2015. Mr. P Jana, Assistant Chief Technical Officer, Mr. BD Ojha, Sr. Technical Assistant, Mr. AK Parida, Sr. Technical Assistant and Mrs. R Gayatri Kumari, Sr. Technical Assistant represented the institute.

CRRl participated in the Eastern Zone Regional Agriculture Fair on 'Rural Livelihood Security for Eastern Plains of India' at Central Potato Research Station, Patna, Bihar from 19 to 21 February 2015. Dr. SM Prasad, PC, KVK, Santhapur, Mr. P Kar, Assistant Chief Technical Officer and Mr. P Jana, Assistant Chief Technical Officer represented the institute.

CRRl participated in the Odisha State Agriculture Fair 'Krishi Mahotsav-2015' at Janata Maidan, Chandrasekharapur, Bhubaneswar from 5 to 8 March 2015. Mr. P Jana, Assistant Chief Technical Officer, Mr. BD Ojha, Sr. Technical Assistant and Mr. AK Parida, Sr. Technical Assistant represented the institute.

Training and Workshop

One Trainers Training Programme on "Hybrid Rice Production Technology" sponsored by the State Institute for Management of Agriculture" (SIMA), Lucknow was organized for 30 state Extension Functionaries from 16 to 20 March 2015. Dr. Lipi Das and Dr. SK Mishra, Senior Scientists coordinated the programme.

One Exposure-cum-Training Programme on "Rice Production Technology" sponsored by Centre for Agriculture and Rural Development (CARD), New Delhi was organized for 24 progressive farmers of Ahmadabad district of Gujarat from 23 to 24 March 2015. Dr. SK Mishra, Senior Scientists coordinated the programme.

ଏକାଦଶ ଦିନ ମଧ୍ୟରେ ଯୋଜା ଦିଆଯାଇଥିବା ଚଳିତା ବର୍ଷର ଉନ୍ନତ ଉତ୍ପାଦନ ପାଇଁ ରାଜ୍ୟ ସରକାରଙ୍କୁ ପ୍ରୋତ୍ସାହିତ କରିବାକୁ ନିର୍ଦ୍ଦେଶ ଦିଆଯାଇଛି । ଏଥିରେ ଉଲ୍ଲେଖ୍ୟ ଯେ, ପ୍ରତିଷ୍ଠାନଟିରୁ ଉପାଦାନ ପ୍ରଦାନ କରିବା ସହ, ବିଭିନ୍ନ ସ୍ତରର ଅଧ୍ୟାପକମାନଙ୍କୁ ଉପଯୋଗୀ କରିବାକୁ ଉଦ୍ଦେଶ୍ୟ ରଖାଯାଇଛି ।

ଜିନିଷ

ଫେବୃଆରୀ ୧୪ ରୁ ୧୭ ତାରିଖ ୨୦୧୫, ୨୦୧୫ ପାଇଁ ନୂଆ ଉପାଦାନ ସାଧନ କମିଟିର ମିଳିତ ସମୀକ୍ଷା କାର୍ଯ୍ୟକ୍ରମ ଅନୁଷ୍ଠାନିତ ହୋଇଥିଲା । ଏଥିରେ ବିଭିନ୍ନ ଅନୁଷ୍ଠାନର ପ୍ରତିନିଧିମାନଙ୍କର ଉପସ୍ଥିତି ଥିଲା । ଉପାଦାନ ସାଧନ କମିଟିର ସଭାରେ ବିଭିନ୍ନ ଉପାଦାନ ସାଧନ କମିଟିର ଅନୁଷ୍ଠାନିକମାନଙ୍କର ପ୍ରତିନିଧିମାନଙ୍କର ଉପସ୍ଥିତି ଥିଲା ।

ଫେବୃଆରୀ ୧୯ ରୁ ୨୧ ତାରିଖ ୨୦୧୫, ୨୦୧୫ ପାଇଁ ଉପାଦାନ ସାଧନ କମିଟିର ମିଳିତ ସମୀକ୍ଷା କାର୍ଯ୍ୟକ୍ରମ ଅନୁଷ୍ଠାନିତ ହୋଇଥିଲା । ଏଥିରେ ବିଭିନ୍ନ ଅନୁଷ୍ଠାନର ପ୍ରତିନିଧିମାନଙ୍କର ଉପସ୍ଥିତି ଥିଲା । ଉପାଦାନ ସାଧନ କମିଟିର ସଭାରେ ବିଭିନ୍ନ ଉପାଦାନ ସାଧନ କମିଟିର ଅନୁଷ୍ଠାନିକମାନଙ୍କର ପ୍ରତିନିଧିମାନଙ୍କର ଉପସ୍ଥିତି ଥିଲା ।

ଫେବୃଆରୀ ୨୫ ରୁ ୨୮ ତାରିଖ ୨୦୧୫, ୨୦୧୫ ପାଇଁ ଉପାଦାନ ସାଧନ କମିଟିର ମିଳିତ ସମୀକ୍ଷା କାର୍ଯ୍ୟକ୍ରମ ଅନୁଷ୍ଠାନିତ ହୋଇଥିଲା । ଏଥିରେ ବିଭିନ୍ନ ଅନୁଷ୍ଠାନର ପ୍ରତିନିଧିମାନଙ୍କର ଉପସ୍ଥିତି ଥିଲା । ଉପାଦାନ ସାଧନ କମିଟିର ସଭାରେ ବିଭିନ୍ନ ଉପାଦାନ ସାଧନ କମିଟିର ଅନୁଷ୍ଠାନିକମାନଙ୍କର ପ୍ରତିନିଧିମାନଙ୍କର ଉପସ୍ଥିତି ଥିଲା ।

ଜିନିଷ ଉପାଦାନ ସାଧନ

ଫେବୃଆରୀ ୧୬ ରୁ ୨୦ ତାରିଖ ୨୦୧୫, ୨୦୧୫ ପାଇଁ ଉପାଦାନ ସାଧନ କମିଟିର ମିଳିତ ସମୀକ୍ଷା କାର୍ଯ୍ୟକ୍ରମ ଅନୁଷ୍ଠାନିତ ହୋଇଥିଲା । ଏଥିରେ ବିଭିନ୍ନ ଅନୁଷ୍ଠାନର ପ୍ରତିନିଧିମାନଙ୍କର ଉପସ୍ଥିତି ଥିଲା । ଉପାଦାନ ସାଧନ କମିଟିର ସଭାରେ ବିଭିନ୍ନ ଉପାଦାନ ସାଧନ କମିଟିର ଅନୁଷ୍ଠାନିକମାନଙ୍କର ପ୍ରତିନିଧିମାନଙ୍କର ଉପସ୍ଥିତି ଥିଲା ।

ଫେବୃଆରୀ ୨୩ ରୁ ୨୪ ତାରିଖ ୨୦୧୫, ୨୦୧୫ ପାଇଁ ଉପାଦାନ ସାଧନ କମିଟିର ମିଳିତ ସମୀକ୍ଷା କାର୍ଯ୍ୟକ୍ରମ ଅନୁଷ୍ଠାନିତ ହୋଇଥିଲା । ଏଥିରେ ବିଭିନ୍ନ ଅନୁଷ୍ଠାନର ପ୍ରତିନିଧିମାନଙ୍କର ଉପସ୍ଥିତି ଥିଲା । ଉପାଦାନ ସାଧନ କମିଟିର ସଭାରେ ବିଭିନ୍ନ ଉପାଦାନ ସାଧନ କମିଟିର ଅନୁଷ୍ଠାନିକମାନଙ୍କର ପ୍ରତିନିଧିମାନଙ୍କର ଉପସ୍ଥିତି ଥିଲା ।



One collaborative training programme on “Scientific Cultivation of fruit crops and its scientific ripening technology” was organized by Samagra Agribusiness Pvt. Ltd., Hyderabad at Hotel Grand Residency, Cuttack on 5 March 2015 in which Sri Bani Singh, Deputy Director, National Horticulture Board, Bhubaneswar, Shri CS Rao, Member, National Horticulture Board, Ministry of Agriculture, GOI and Dr. AK Das, HOD, Horticulture and Fruit Science, OUAT attended the programme. Forty three farmers and rural youth from different blocks of Cuttack district participated in this programme.

Front Line Demonstrations (FLDs)

Five Front Line Demonstrations entitled “Demonstration of incubated bio-fertilizers (PSB an Azotobacter @ 5 kg/ha) in cauliflower”, “Demonstration of foliar spray of zinc EDTA (0.5 g/lit. water) on quality and yield of cabbage”, “Demonstration of management of downy mildew in cabbage”, “Demonstration of oyster mushroom” and “Demonstration of dual purpose coloured synthetic poultry bird Banaraja (220 no.)” were organized for 73 farmers/farmwomen of Uchhapada (Tangi-Choudwar), Mangarajpur (Badamba), Murgakul (Cuttack Sadar), Jodum (Narsinghpur) and Abhaypur (Tangi-Choudwar), respectively. FLD pulses on green gram (var. SML 668) in 5.4 ha and black gram (var. PU 31) in 6.0 ha was also conducted involving 12 and 16 farmers, respectively of Cuttack district.

On Farm Trials (OFTs)

Four On Farm Trials entitled “Assessment of seed treatment with molybdenum @ 3 g/kg seed) and Rhizobium @ 250 g/acre seed on yield of green gram”, “Assessment of two foliar sprays (30 and 40 DAS) of boron @ 0.3 per cent (3 g/lit. water) on yield of groundnut”, “Assessment of metalixil + carbendazim against late blight of potato” and “Assessment of performance evaluation of mineral supplements on milk yield of nondescript cows” were started at Mangarajpur (Badamba), Andhoti (Barang), Uchhapada, Kadei, Gurujang and Ganeswarpur (Tangi-Choudwar) and Khadibila (Niali) for 15 farmers each. Shri DR Sarangi conducted three field visits to record data on OFTs and also on FLDs implemented in rabi and Post-rabi on groundnut, green gram and cauliflower in Tangi-Choudwar block.

Animal Health Camp

Two Animal Health Camp-cum-ASCAD Training Programme were organized in collaboration with BVO, Tangi-Choudwar and AVAS, Choudwar at village Gurujang and Guali (Tangi-Choudwar) on 21 February 2015 and 20 March 2015 in which 414 animals were diagnosed and treated and 50 no. of villages participated in the training.

ଓଡ଼ିଶା ଶାସନର ଉପକ୍ରମଣ ପ୍ରକଳ୍ପର ୫ ଶ୍ରେଣୀର ୨୦୧୫-୧୬ ବର୍ଷର ପ୍ରକଳ୍ପର ଉଦ୍ଦେଶ୍ୟ ଅଟେ ଓଡ଼ିଶାରେ ଉପଲବ୍ଧ ସ୍ୱାସ୍ଥ୍ୟକର ଓ ଉଚ୍ଚ ଶକ୍ତି ବିଶିଷ୍ଟ ଶିଳ୍ପାଳୟଗୁଡ଼ିକୁ ଉତ୍ପାଦନ କରିବାକୁ ଉତ୍ସାହଜନକ କରିବାକୁ । ଏହା ସହିତ ଉପଯୁକ୍ତ କର୍ମକ୍ରମ ଚଳାଇବାକୁ ଓ ଉପଯୁକ୍ତ ଉପାଦାନଗୁଡ଼ିକୁ ଉପଲବ୍ଧ କରିବାକୁ ମଧ୍ୟ ଉଦ୍ଦେଶ୍ୟ ରଖାଯାଇଛି । ଉପରୋକ୍ତ ଉଦ୍ଦେଶ୍ୟ ଉପରେ ଉପକ୍ରମଣ ପ୍ରକଳ୍ପର ଅନ୍ତର୍ଗତ ୫ ଶ୍ରେଣୀର ୨୦୧୫-୧୬ ବର୍ଷର ପ୍ରକଳ୍ପର ଉଦ୍ଦେଶ୍ୟ ଅଟେ ଓଡ଼ିଶାରେ ଉପଲବ୍ଧ ସ୍ୱାସ୍ଥ୍ୟକର ଓ ଉଚ୍ଚ ଶକ୍ତି ବିଶିଷ୍ଟ ଶିଳ୍ପାଳୟଗୁଡ଼ିକୁ ଉତ୍ପାଦନ କରିବାକୁ ଉତ୍ସାହଜନକ କରିବାକୁ । ଏହା ସହିତ ଉପଯୁକ୍ତ କର୍ମକ୍ରମ ଚଳାଇବାକୁ ଓ ଉପଯୁକ୍ତ ଉପାଦାନଗୁଡ଼ିକୁ ଉପଲବ୍ଧ କରିବାକୁ ମଧ୍ୟ ଉଦ୍ଦେଶ୍ୟ ରଖାଯାଇଛି ।

+ଓଡ଼ିଶା ଉପକ୍ରମଣ

—SS୧(କୃଷି ଓ ମାତୃତା), ଭୁବନେଶ୍ୱର, ପ୍ରତିଷ୍ଠାପକ (ପ୍ରତିଷ୍ଠାପକ), ପ୍ରତିଷ୍ଠାପକ (ପ୍ରତିଷ୍ଠାପକ) (ପ୍ରତିଷ୍ଠାପକ) ଓ ୭୩ ଉପକ୍ରମଣର ଉପକ୍ରମଣ ପ୍ରକଳ୍ପର ଉଦ୍ଦେଶ୍ୟ ଅଟେ ଓଡ଼ିଶାରେ ଉପଲବ୍ଧ ସ୍ୱାସ୍ଥ୍ୟକର ଓ ଉଚ୍ଚ ଶକ୍ତି ବିଶିଷ୍ଟ ଶିଳ୍ପାଳୟଗୁଡ଼ିକୁ ଉତ୍ପାଦନ କରିବାକୁ ଉତ୍ସାହଜନକ କରିବାକୁ । ଏହା ସହିତ ଉପଯୁକ୍ତ କର୍ମକ୍ରମ ଚଳାଇବାକୁ ଓ ଉପଯୁକ୍ତ ଉପାଦାନଗୁଡ଼ିକୁ ଉପଲବ୍ଧ କରିବାକୁ ମଧ୍ୟ ଉଦ୍ଦେଶ୍ୟ ରଖାଯାଇଛି । ଉପରୋକ୍ତ ଉଦ୍ଦେଶ୍ୟ ଉପରେ ଉପକ୍ରମଣ ପ୍ରକଳ୍ପର ଅନ୍ତର୍ଗତ ୫ ଶ୍ରେଣୀର ୨୦୧୫-୧୬ ବର୍ଷର ପ୍ରକଳ୍ପର ଉଦ୍ଦେଶ୍ୟ ଅଟେ ଓଡ଼ିଶାରେ ଉପଲବ୍ଧ ସ୍ୱାସ୍ଥ୍ୟକର ଓ ଉଚ୍ଚ ଶକ୍ତି ବିଶିଷ୍ଟ ଶିଳ୍ପାଳୟଗୁଡ଼ିକୁ ଉତ୍ପାଦନ କରିବାକୁ ଉତ୍ସାହଜନକ କରିବାକୁ । ଏହା ସହିତ ଉପଯୁକ୍ତ କର୍ମକ୍ରମ ଚଳାଇବାକୁ ଓ ଉପଯୁକ୍ତ ଉପାଦାନଗୁଡ଼ିକୁ ଉପଲବ୍ଧ କରିବାକୁ ମଧ୍ୟ ଉଦ୍ଦେଶ୍ୟ ରଖାଯାଇଛି ।

ଉପକ୍ରମଣର ଉପକ୍ରମଣ

—ପ୍ରତିଷ୍ଠାପକ (ପ୍ରତିଷ୍ଠାପକ) ୩ ଓଡ଼ିଶା ଉପକ୍ରମଣ ପ୍ରକଳ୍ପର ଉଦ୍ଦେଶ୍ୟ ଅଟେ ଓଡ଼ିଶାରେ ଉପଲବ୍ଧ ସ୍ୱାସ୍ଥ୍ୟକର ଓ ଉଚ୍ଚ ଶକ୍ତି ବିଶିଷ୍ଟ ଶିଳ୍ପାଳୟଗୁଡ଼ିକୁ ଉତ୍ପାଦନ କରିବାକୁ ଉତ୍ସାହଜନକ କରିବାକୁ । ଏହା ସହିତ ଉପଯୁକ୍ତ କର୍ମକ୍ରମ ଚଳାଇବାକୁ ଓ ଉପଯୁକ୍ତ ଉପାଦାନଗୁଡ଼ିକୁ ଉପଲବ୍ଧ କରିବାକୁ ମଧ୍ୟ ଉଦ୍ଦେଶ୍ୟ ରଖାଯାଇଛି । ଉପରୋକ୍ତ ଉଦ୍ଦେଶ୍ୟ ଉପରେ ଉପକ୍ରମଣ ପ୍ରକଳ୍ପର ଅନ୍ତର୍ଗତ ୫ ଶ୍ରେଣୀର ୨୦୧୫-୧୬ ବର୍ଷର ପ୍ରକଳ୍ପର ଉଦ୍ଦେଶ୍ୟ ଅଟେ ଓଡ଼ିଶାରେ ଉପଲବ୍ଧ ସ୍ୱାସ୍ଥ୍ୟକର ଓ ଉଚ୍ଚ ଶକ୍ତି ବିଶିଷ୍ଟ ଶିଳ୍ପାଳୟଗୁଡ଼ିକୁ ଉତ୍ପାଦନ କରିବାକୁ ଉତ୍ସାହଜନକ କରିବାକୁ । ଏହା ସହିତ ଉପଯୁକ୍ତ କର୍ମକ୍ରମ ଚଳାଇବାକୁ ଓ ଉପଯୁକ୍ତ ଉପାଦାନଗୁଡ଼ିକୁ ଉପଲବ୍ଧ କରିବାକୁ ମଧ୍ୟ ଉଦ୍ଦେଶ୍ୟ ରଖାଯାଇଛି ।

ଉପକ୍ରମଣ ପ୍ରକଳ୍ପର ଉଦ୍ଦେଶ୍ୟ ଅଟେ ଓଡ଼ିଶାରେ ଉପଲବ୍ଧ ସ୍ୱାସ୍ଥ୍ୟକର ଓ ଉଚ୍ଚ ଶକ୍ତି ବିଶିଷ୍ଟ ଶିଳ୍ପାଳୟଗୁଡ଼ିକୁ ଉତ୍ପାଦନ କରିବାକୁ ଉତ୍ସାହଜନକ କରିବାକୁ । ଏହା ସହିତ ଉପଯୁକ୍ତ କର୍ମକ୍ରମ ଚଳାଇବାକୁ ଓ ଉପଯୁକ୍ତ ଉପାଦାନଗୁଡ଼ିକୁ ଉପଲବ୍ଧ କରିବାକୁ ମଧ୍ୟ ଉଦ୍ଦେଶ୍ୟ ରଖାଯାଇଛି । ଉପରୋକ୍ତ ଉଦ୍ଦେଶ୍ୟ ଉପରେ ଉପକ୍ରମଣ ପ୍ରକଳ୍ପର ଅନ୍ତର୍ଗତ ୫ ଶ୍ରେଣୀର ୨୦୧୫-୧୬ ବର୍ଷର ପ୍ରକଳ୍ପର ଉଦ୍ଦେଶ୍ୟ ଅଟେ ଓଡ଼ିଶାରେ ଉପଲବ୍ଧ ସ୍ୱାସ୍ଥ୍ୟକର ଓ ଉଚ୍ଚ ଶକ୍ତି ବିଶିଷ୍ଟ ଶିଳ୍ପାଳୟଗୁଡ଼ିକୁ ଉତ୍ପାଦନ କରିବାକୁ ଉତ୍ସାହଜନକ କରିବାକୁ । ଏହା ସହିତ ଉପଯୁକ୍ତ କର୍ମକ୍ରମ ଚଳାଇବାକୁ ଓ ଉପଯୁକ୍ତ ଉପାଦାନଗୁଡ଼ିକୁ ଉପଲବ୍ଧ କରିବାକୁ ମଧ୍ୟ ଉଦ୍ଦେଶ୍ୟ ରଖାଯାଇଛି ।



CR Dhan 307 (Maudamani): Developed from the cross Dandi/Naveen//Dandi is suitable for cultivation in irrigated areas of Odisha. It has maturity duration of 135 days, plant height of 110 cm, short bold grains and average grain yield capacity of 4.8 t/ha. This variety has moderate tolerance to leaf blast, brown spot, sheath rot, stem borer and leaf folder.

SK Pradhan and Nakula Barik
CRRRI, Cuttack



CR Dhan 408 (Chakaakhi): Developed from the cross CR 149-5010-228/T1242, is suitable for cultivation in shallow lowland areas of Odisha in *kharif* season. It has maturity duration of 165 days, plant height of 135 cm, long bold grain and has average grain yield capacity of 4.8 t/ha. This variety has moderate tolerance to leaf blast, neck blast, brown spot, bacterial leaf blight, sheath rot, stem borer, leaf folder and WBPH.

SK Pradhan, SSC Pattanaik, L Behera, S Lenka, BB Panda, Nakula Barik and A Ghosh,
CRRRI, Cuttack



CR Dhan 701: This hybrid developed from CRMS 31 A/CRL-22 R, is suitable for cultivation in irrigated and shallow lowland areas of Odisha in both *kharif* and *rabiseason*. It has maturity duration of 142 days, plant height of 120 cm, medium slender grain and has average grain yield capacity of 6.0 t/ha. This hybrid has moderate tolerance to brown spot, sheath blight, RTD and GLH.

RN Rao, SSC Pattnaik, GJN Rao, RL Verma, JL Katara,
ON Singh and T Mohapatra
CRRRI, Cuttack

Comparative transcriptome analysis of rice genotypes differing in tolerance to anaerobic germination using RNA-Seq

Unregulated flooding during germination in rice often leads to reduced seed viability, plant vigor and concomitant economic losses. Natural variation in genotypes of rice exists for tolerance to anaerobic germination. The present investigation was undertaken with an objective of understanding the differential responses of two rice varieties, Naveen (susceptible to anaerobic germination) and AC 41620 (tolerant to anaerobic germination) at the global transcription level post 48 h of anoxic stress during germination. RNA sequencing using the Illumina HiSeq2000 platform revealed a total of 108,575,418 raw reads from four samples which were preprocessed to generate 95,956,532 high quality reads ($Q>25$) and aligned to *indica* reference genome. As a general observation, differentially regulated genes were more in case of tolerant genotype, AC 41620 (1130 DEGs), compared to susceptible genotype, Naveen (930 DEGs) (Fig 1. A). Comparison of transcriptome profiles revealed that 604 genes were uniquely up-regulated and 164 genes were uniquely down-regulated in tolerant genotype, AC 41620, while the corresponding numbers of genes in case of susceptible genotype, Naveen were 520 and 60, respectively (Fig 1. B). Several transcription factors were highly expressed in both genotypes under stress. Five most highly represented classes were AP2-EREBP, bHLH, MYB, WRKY and NAC (Fig 1. C). However, in case of AC41620, a few transcription factor families were also uniquely induced (Fig 1. D). Pathway analysis using MAPMAN revealed that genes involved in light reaction, calvin cycle, starch metabolism and anaerobic respiration were either over-represented or highly expressed in tolerant AC 41620 whereas expansins were found to be highly expressed in Naveen. Singular enrichment analysis of biological processes in AgriGO (<http://bioinfo.cau.edu.cn/agriGO/analysis.php>) suggests more elaborative activation of pathways related to stress, photosynthesis and carbohydrate metabolism in tolerant genotype, AC 41620, whereas in susceptible genotype, Naveen, signatures of DNA

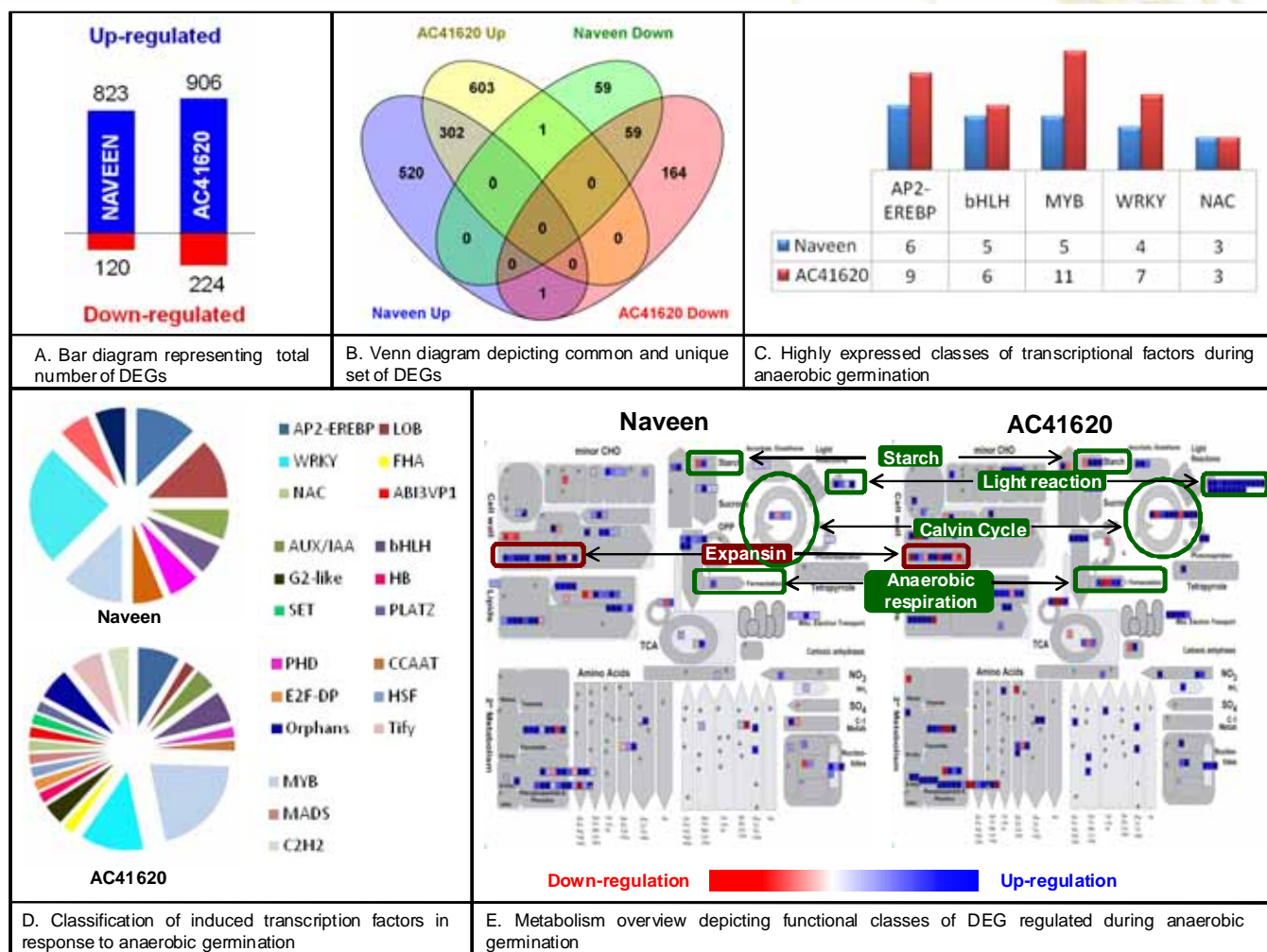


Fig 1. Differential gene expression of rice genotypes Naveen and AC41620 during aerobic germination

metabolism was evident. Pathways related to secondary metabolism seems to be active in both the genotypes (Fig 1. E). The DEGs and transcription factors identified in the present study will serve as a useful genomic resource for extending our understanding of molecular mechanism of anaerobic germination in rice.

J Vijayan, S Senapati, A Ray, S Ray, K Chattopadhyay, RK Sarkar and T Mohapatra
CRRRI, Cuttack

Frequency and fertility restoration efficiency of *Rf3* and *Rf4* genes in rice

Increasing the yield of rice is necessary in order to provide food for expanding world population. The yield potential of hybrid rice is 15-20% more as compared to improved varieties. One of the important requirements for full exploitation of heterotic potentials in rice is the availability of diverse genotypes as parents possessing good combining ability. Identification of new parental lines and the categorization as restorer or maintainer are important for the development of new hybrids.

In this study, 570 rice varieties released for different ecologies in India were screened for the presence of fertility restorer genes (*Rf3* and *Rf4*) using linked markers. Categorization of varieties based on the allelic constitution at the two marker loci revealed that 13% contained dominant functional alleles of both *Rf3* and *Rf4* (*Rf3Rf3Rf4Rf4*), 6% varieties carried only *Rf3* dominant functional allele (*Rf3Rf3rf4rf4*), 50% had only *Rf4* dominant functional allele (*rf3rf3Rf4Rf4*) and 31% possessed recessive alleles of both the genes (*rf3rf3rf4rf4*). This result showed predominant occurrence of dominant allele of *Rf4* (63%) as compared to that of *Rf3* (19%). Based on the allelic status of the two restorer genes, 570 varieties were divided into four groups viz., Group-I (*rf3rf3rf4rf4*), Group-II (*Rf3Rf3Rf4Rf4*), Group-III (*Rf3Rf3rf4rf4*) and Group-IV (*rf3rf3Rf4Rf4*). Ten varieties from each group were randomly chosen and test crossed with two different CMS

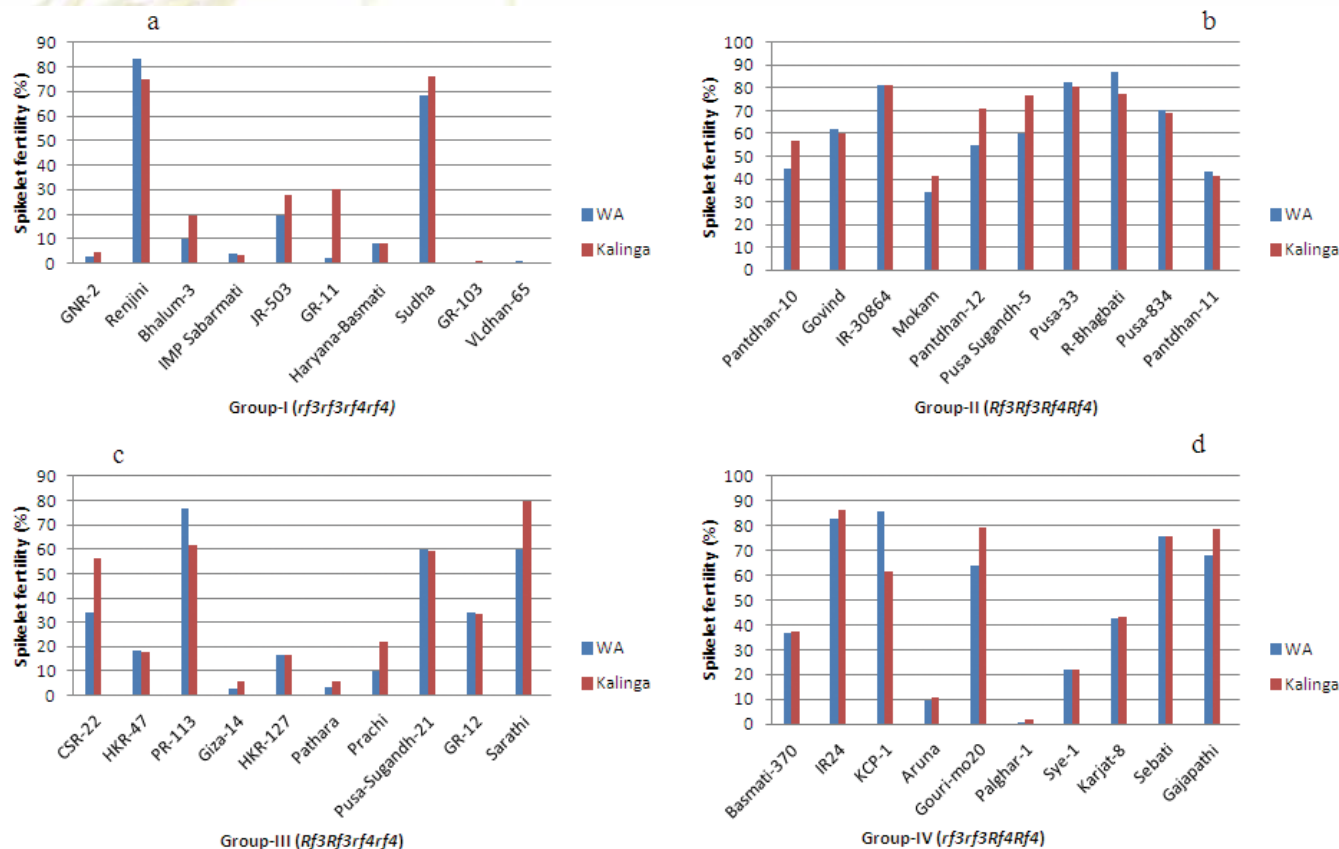


Fig 2 (a-d). Fertility restoration analysis of four groups constituted based on allelic combination at Rf3 and Rf4 loci. a): Group-I (Rf3Rf3Rf4Rf4), b): group-II (Rf3Rf3Rf4Rf4), c): group-III (Rf3Rf3Rf4Rf4) and d): group-IV (Rf3Rf3Rf4Rf4). Variety names and spikelet fertility percentage are depicted along the horizontal and vertical axis respectively.

lines, viz., CRMS31A (containing WA cytoplasm) and CRMS32A (containing Kalinga cytoplasm). All the resultant F_1 s along with parental lines were evaluated for spikelet fertility. Diverse fertility restoration patterns were observed among the four groups as shown in (Fig 2). Comparison of fertility restoration of WA and Kalinga CMS showed that most of the varieties in all four groups behaved more or less similar. However, some of the varieties differed in their ability to restore fertility of the two CMS lines (Fig 2). The presence of dominant alleles of both the restorer genes was more effective in fertility restoration. The efficacy of *Rf4* is relatively more than *Rf3*. In contrast, two varieties carrying recessive alleles of both of the restorer genes were also able to restore fertility indicating involvement of other fertility restorer gene(s) apart from *Rf3* and *Rf4*. The varieties viz. GNR-2, Improved Sabarmati, GR-103, VL Dhan-65 and Palghar-1 were found to be effective maintainers and IR-30864, Pusa-33, R-Bhagbati, IR24 and Sebati as effective restorers, which could be used for hybrid rice development employing CMS technology.

JL Kataria, RL Verma, D Nayak, U Ngangkham, S Ray,
L Behera, HN Subudhi, S Samantaray, ON Singh and T Moahapatra
CRRRI, Cuttack

Evaluation of introgression lines carrying drought and blast QTLs (qDTY12.1+Pi2)

Ten introgression lines (qDTY12.1+Pi2) in the background of rice variety Vandana along with parent were evaluated in drought stress and non-stress conditions under direct seeding in uplands. The same set was also screened for blast resistance in uniform blast nursery (UBN) under artificial epiphytotic condition. The drought stress trial experienced 20 days of stress period corresponding to flowering to grain filling stage. Four ILs viz., CRR747-16-3-B, CRR747-12-4-B, CRR747-12-3-B and CRR747-16-5-B significantly out yielded the recurrent parent Vandana under stress condition and there was no significant difference under non-stress condition (Table 1). These ILs showed 33.4 to 60.6 % yield advantage over recurrent parent Vandana under stress condition. The introgression lines have same flowering duration as that of recurrent parent Vandana but were slightly taller in stature. In the UBN the introgression lines did not show any

infection and scored as '0' for leaf blast disease (SES), whereas the parent Vandana was scored '4'. The ILs developed, will have an impact on the yield stability of Vandana in the drought and blast-prone areas of rainfed uplands and will serve as a breeding stock for the further improvement of upland rice in breeding programs.

Table 1: Performance of Vandana drought & blast QTLs (*qDTY12.1+Pi2*) introgression lines under stress & non-stress conditions

Entry	Days to 50% Flw.		Plant height (cm)		Grain yield (kg/ha)		Leaf blast score (SES)
	Stress	NS	Stress	NS	Stress	NS	
CRR747-3-6-B	60	64	89.3	99.4	1219	2517	0
CRR747-3-7-B	63	64	84.7	110.9	388	2750	0
CRR747-3-8-B	63	66	88.5	110.4	938	2333	0
CRR747-16-1-B	63	65	93.0	107.4	1200	2750	0
CRR747-16-2-B	62	64	87.5	106.7	919	1750	0
CRR747-16-3-B	63	65	91.3	110.4	1656	2667	0
CRR747-12-1-B	64	66	87.3	102.8	938	1767	0
CRR747-12-3-B	61	65	95.9	108.9	1375	2417	0
CRR747-12-4-B	59	64	93.3	109.2	1469	2650	0
CRR747-16-5-B	63	66	89.8	108.3	1388	2350	0
Vandana	64	65	85.0	97.7	1031	2517	4
5%LSD	1.3	2.6	4.8	6.6	255	610	

NS= Non- stress

NP Mandal and M Variar
CRURRS (CRR), Hazaribag

Characterization of salt-tolerant diazotrophs from rhizosphere of diverse rice ecology

Soil samples were collected from three diverse rice ecologies i.e. upland (BAU, Ranchi & CRURRS, Hazaribag), lowland (CRR, Cuttack) and shallow lowland (RRLRRS, Gerua). All together, 78 distinct rhizobacteria were isolated from rhizospheric soils of above regions. Among them, 38 salt-tolerant (15% NaCl) diazotrophic rhizobacteria were screened and tested for other PGP traits. Out of them, three isolates (CA54, GH47 and HR12) showed wide range of functional diversity (carbon-source utilization) and PGP traits. Finally, eleven salt-tolerant polyvalent PGPR were identified though 16S-rDNA sequencing. Out of eleven, two isolates (RM19 and HR62) identified as *Brevibacterium halotolerans*; eight isolates (CA54, GH47, CA66, CA68, GH21, HR40, HR58 and HR61) belonged to different species of genus *Bacillus* and one isolate (RM77) identified as *Pantoea agglomerans*. *In silico* restriction (with *HaeIII*) of 16S sequences of all identi-

Table 2. Frequency and cutting site of *HaeIII* in 16S-rDNA sequence of salt-tolerant isolates

Salt-tolerant isolates	Identity	NCBI* accession no.	Frequency of cutting (no.)	Cutting site position (bp)
CA54	<i>Bacillus stratosphericus</i>	KM261757	4	27, 486, 1083, 1105
CA68	<i>Bacillus</i> sp.	KM261761	5	95, 552, 586, 1151, 1173
GH21	<i>Bacillus aerophilus</i>	KM261759	2	94, 551
GH47	<i>Bacillus aerius</i>	-	5	266, 493, 725, 809, 960
HR40	<i>Brevibacterium halotolerans</i>	KM261762	4	442, 476, 1042, 1064
HR58	<i>Bacillus cereus</i>	KM261763	3	442, 1037, 1059
HR61	<i>Bacillus anthresis</i>	KM261764	4	101, 558, 1155, 1177
HR62	<i>Bacillus altitudinis</i>		2	92, 549
RM77	<i>Bacillus stratosphericus</i>	KM261765	8	101, 281, 349, 559, 593, 754, 1071, 1275
CA66	<i>Pantoea agglomerans</i>	KM261758	4	97, 554, 1152, 1174
RM19	<i>Brevibacterium halotolerans</i>	-	2	93, 550

* NCBI: National Center for Biotechnology Information, New York, USA

^ *HaeIII*: Restriction enzyme of *Haemophilus aegyptius*

fied isolates showed distinct diversity among them. The PGP-efficacy of salt-tolerant isolates (CA54, GH47 and HR12) was performed in salt-sensitive rice variety (Naveen) for growth promotion at both ambient salt (0 dS/m) and elevated salt (2 dS/m) conditions. All the strains significantly increased the shoot and root length, fresh and dry weight as compare to control (Table 2).

U Kumar and TK Dangar
CRRRI, Cuttack

Identification of causal organism of brown spots produced on rice leaves at CRRRI, Cuttack

There was incidence of brown spot after cyclone. Samples were collected during last fortnight of October 2013. The associated pathogen was isolated by host tissue transplant method. DNA was extracted, ITS region was amplified and sequencing was done. Pair-wise alignment between a query and database sequences was conducted using NCBI-BLAST. Phylogeny reconstruction by boot strap test was done in MEGA4 for identifying the organism.

The evolutionary history was inferred using the UPGMA method. The optimal tree with the sum of branch length = 10.14158900 is shown. The percentage of replicate trees in which the associated taxa clustered together in the bootstrap test (500 replicates) are shown next to the branches. The tree is drawn to scale, with branch lengths in the same units as those of the evolutionary distances used to infer the phylogenetic tree. *Cochliobolus miyabeanus* was the pathogen associated with the samples collected during this study.

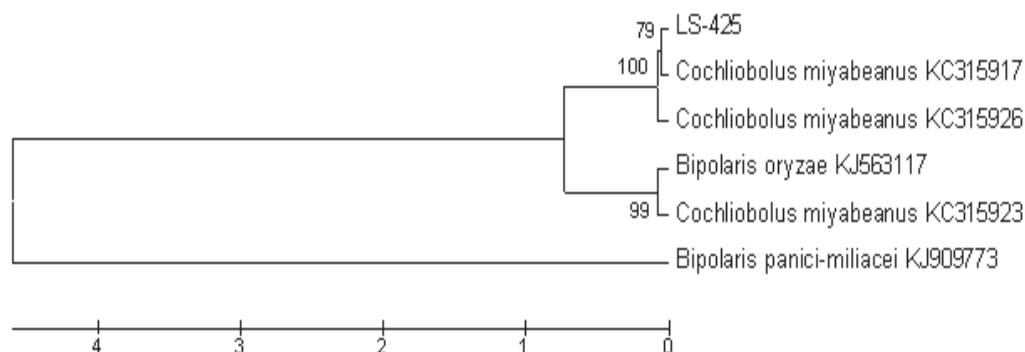
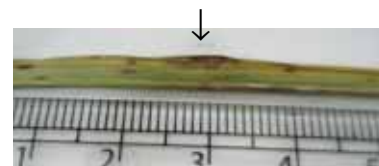


Fig 3. Evolutionary relationship of six taxa

Urmila Dhua and AK Mukherjee
CRRRI, Cuttack

Synthesis and characterization of silver nanoparticles

Biosynthesis of silver nanoparticles (Ag-NPs) mediated by plant extracts has been undertaken. 1mM silver nitrate solution was mixed with different ratio of plant extract at different temperature and at different time. The reduction of silver was monitored by using the UV-Vis spectral analysis. The color of the mixture turned light brown in 48 h and became dark brown after 72 h indicative of the formation of Ag-NPs. Strong surface plasmon resonance of Ag-NPs was

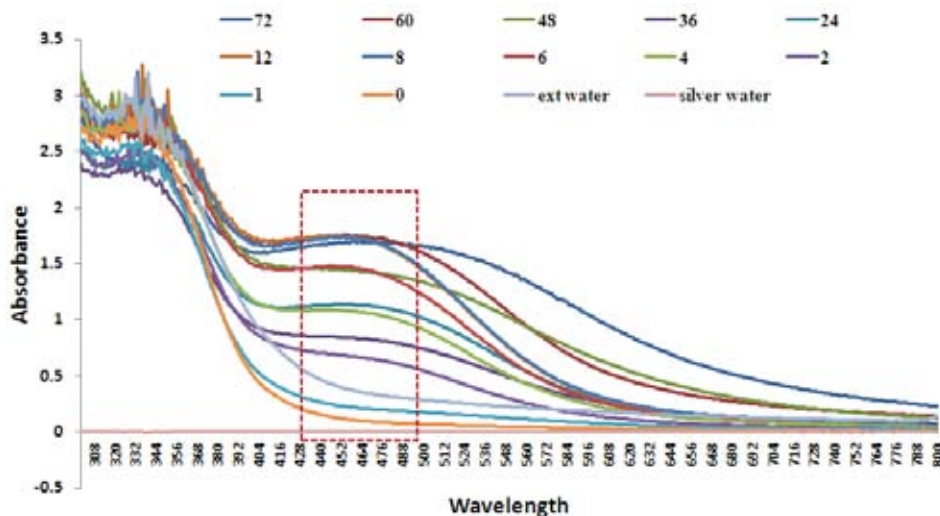


Fig 4. Ultraviolet-visible spectra of synthesized nanoparticles at different time intervals

centered at 420-480 nm (Fig 4). Particle sizes of synthesized Ag-NPs were ranged between 36-107 nm during different time intervals. The zeta potential was found to be between -14.16 to -29.45 mV. The negative value of zeta potential shows repulsion among the particles and thus increasing the stability of nanoparticles. IR spectra showed distinct peaks at 3432, 2924, 2853, 1638, 1165 and 1037 cm^{-1} . Presence of metabolites in plant extract may be acted as capping agent. This will improve the stability of synthesized nanoparticles. Role of these silver nanoparticles will be further tested for their pesticidal effects.

Totan Adak, AK Mukherjee, Berliner J and Somnath S Pokhare
CRRRI, Cuttack

Persistence of fipronil in soil under rice ecosystem

Fipronil (5-amino-3-cyano-1-(2, 6-dichloro-4-trifluoromethylphenyl)-4-trifluoromethyl sulfinyl pyrazole) is a broad spectrum insecticide for the management of the yellow stem borer and leaf folder in rice. Persistence of fipronil (Regent 0.3G) at recommended dose (RD) @ 75g a.i./ha and at double the recommended dose (DRD) @ 150 g a.i./ha was studied. For residue analysis, soil samples were collected at 0, 1, 3, 5, 7, 10, 15 and 30 days after application of the insecticide. Initial residue recovered was 0.065 $\mu\text{g/g}$ for the recommended dose and was 0.136 $\mu\text{g/g}$ for double the recommended dose. After 30 days of study, total fipronil residue recorded less than 0.005 $\mu\text{g/g}$ for recommended dose. Overall, total fipronil persisted in rice cultivated soil with 23 days half life for the recommended dose @ 75g a.i./ha. Whereas, half life of fipronil was 19 days at double the recommended dose @ 150 g a.i./ha.

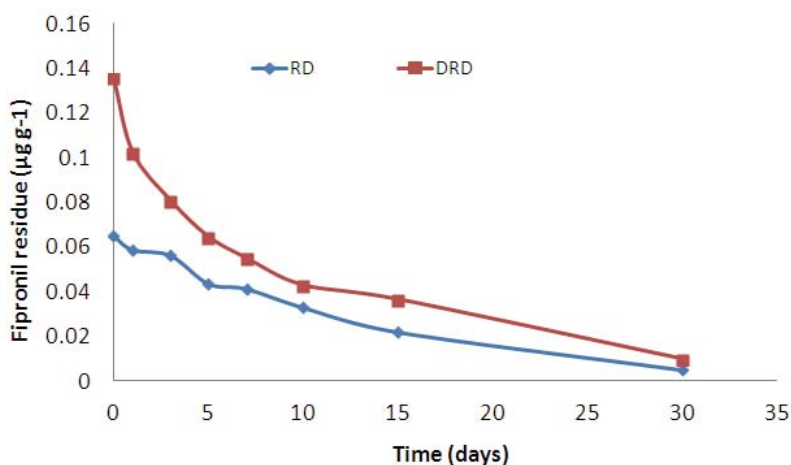


Fig 5. Persistence of fipronil in rice soil

Totan Adak, Berliner J, Somnath S
Pokhare and Mayabini Jena
CRRRI, Cuttack

Delineation of site specific nutrient management zones for paddy cultivated area around the Bhitarkanika mangrove ecosystem of India

The present study aims at dividing the study area which spreads around the Bhitarkanika sanctuary and includes nearly two hundred fifty five inhabited villages under the administrative jurisdiction of Rajnagar block in Kendrapada district of Odisha, into homogenous management zones based on soil fertility and other physicochemical properties. A grid soil sampling pattern was adopted and soil samples were collected. Soil pH, EC, Available K (AK), Available P (AP), Available N (AN), Soil organic carbon, DTPA extractable Fe, Zn, Cu and Mn were analyzed. First step in delineating MZs was to analyze the descriptive statistics of the above soil variables and distribution of these properties was tested for normality using the skewness and kurtosis significance test. Subsequently, correlation analysis was performed between all the soil properties. Then, semi-variance calculations and semi-variogram model fitting were performed using the ArcGIS 10. The fitted models were then used in an ordinary kriging procedure to estimate different properties

Table 3: Principal component analysis and loading coefficients for the first three principal components

	PC1	PC2	PC3
AP	0.823	0.057	0.026
EC	0.822	0.281	0.013
AK	0.8	0.019	0.029
pH	0.696	0.473	-0.046
Zn	0.549	-0.419	0.525
Mn	0.319	0.016	-0.493
SOC	-0.086	0.788	0.359
Fe	-0.566	0.422	-0.314
Cu	-0.316	0.011	0.624
AN	-0.392	0.224	0.258

EC: Electrical Conductivity; AK: Available Potassium; AP: Available Phosphorous; AN: Available Nitrogen; SOC: Soil Organic Carbon; Fe, Zn, Cu and Mn represent DTPA extractable Iron, Zinc, Copper and Manganese in soil, respectively.

at non-measured points as interpolated values for mapping. The cross-validation analysis was conducted for evaluating kriging interpolation bias and accuracy.

Further, principal component analysis (PCA), which is a dimension reduction technique, was performed. In the present study, PCs with Eigen values >1.0 were selected to develop the management zone classes. Finally, AN, AP, AK, Mn, Zn, Fe and Cu were selected and the fuzzy k-mean was used to divide the field into different unique management zones (Table 3). Based on the procedure described, three homogeneous MZs were produced finally (Fig 6).

Rahul Tripathi, Mohammad Shahid, R Raja, Sangita Mohanty, B Lal, Priyanka Gautam, Anjani Kumar and AK Nayak
CRRRI, Cuttack

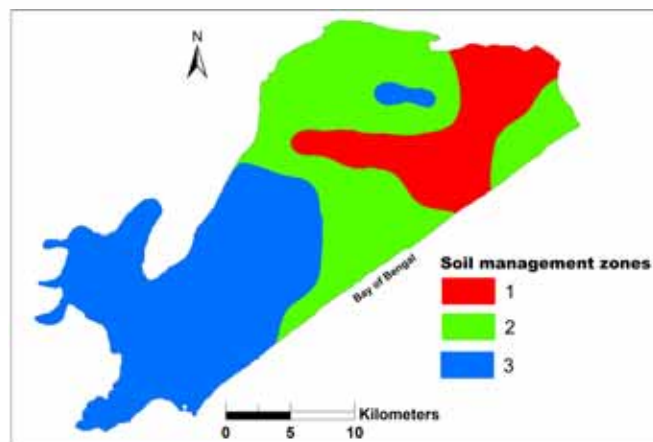


Fig 6. Soil management zones developed on the basis of fuzzy cluster algorithm

Optimum time of planting of *boro* rice in Assam

Field experiments were conducted at the research farm of RRLRRS, Gerua (Assam) during *boro* seasons of 2012-13 and 2013-14 to find out the optimum time of planting of *boro* rice in the north eastern region. Performance of two rice varieties, *viz.*, Chandrama and Naveen were tested under 5 different dates of transplanting (5th, 15th and 25th January, 5th and 15th February) during *boroseason*. Age of seedlings at the time of transplanting was 45 days. The crop transplanted on the 5th January yielded the lowest (5.02 and 4.53 t/ha during 2012-13 and 2013-14, respectively) which might be due to low temperature during early vegetative stage. Thereafter, gradual rise in temperature might have resulted into higher values of growth and yield attributing characters. Grain yield was the highest - 6.45 t/ha in 2012-13 and 6.26 t/ha in 2013-14 – in the crop transplanted on the 25th January. Thereafter, the varieties had non-significant yield differences up to 15th February. Chandrama recorded significantly higher grain yield (6.77 and 5.60 t/ha) over Naveen (5.08 and 5.10 t/ha) which was due to higher values for yield attributing characters especially more number of filled grains per panicle but Chandrama took 20 to 25 days more than Naveen to mature (Table 4). Thus, the optimum time of transplanting for both varieties was found to be the 25th January or the second fortnight of January. Naveen under all the dates of planting took approximately 150 days to mature and could be harvested by the last week of May. Thus, it can escape flash floods from May-end onwards. Chandrama took around 170-175 days to mature and had the risk of facing flash floods in crop planted on later two dates.

Table 4: Performance of rice varieties under different dates of planting during *boro* season

Treatment (Date of planting)	Effective tillers per hill (no.)		Panicle length (cm)		Filled grains per panicle (no.)		Straw yield (t/ha)		Grain yield (t/ha)	
	2012-13	2013-14	2012-13	2013-14	2012-13	2013-14	2012-13	2013-14	2012-13	2013-14
5 th Jan	11.43	9.92	22.78	23.87	129.37	111.58	5.00	5.32	5.02	4.53
15 th Jan	10.97	10.33	23.13	23.94	138.97	122.53	5.80	6.30	5.80	5.28
25 th Jan	10.47	11.18	23.61	23.58	144.80	132.62	6.60	6.92	6.45	6.26
5 th Feb	10.50	10.73	23.22	25.18	139.95	125.83	6.40	6.35	6.23	5.46
15 th Feb	10.83	11.30	23.51	25.81	130.07	127.43	6.60	6.76	6.13	5.22
CD (p=0.05)	NS	0.49	NS	1.30	14.10	8.18	0.72	0.92	0.96	0.78
[Variety]										
Chandrama	10.65	10.80	22.91	24.23	150.89	128.24	6.80	7.10	6.77	5.60
Naveen	11.03	10.60	23.99	24.72	123.57	119.76	5.40	5.60	5.08	5.10
CD (p=0.05)	NS	0.58	0.88	0.47	10.90	8.11	0.52	0.65	0.68	0.32

T Singh, BS Satapathy and KB Pun
RRLRRS (CRRRI), Gerua

Participation in Symposia/Seminars/ Conferences/Training/Workshop/Meeting/ Visits

Mr. A Kumar attended Soil and Water Networking National workshop at IIT, Kharagpur from 4 to 7 January 2015, jointly organized by IIT Kharagpur and The University of Sydney.

Dr. Yogesh Kumar delivered a lecture on 'Way to increase cropping intensity in rainfed drought prone rice systems' in the training programme on Crop Management Module for Agro-climatic zones with special reference to rainfed area organized by Soil Conservation Training Centre, DVC, Hazaribag on 7 January 2015.

Dr. T Mohapatra, Director, CRRI attended the Curtain Raising Programme of DRR Golden Jubilee Celebrations at DRR, Hyderabad on 9 January 2015.

Dr. VK Singh participated in VII Annual Convention and National Seminar on Sustainable Rural Livelihood: Technological & Institutional Perspective, presented a research paper entitled '*Farmer-led innovation of Sugarcane Cultivation for rural prosperity in Koderma, Jharkhand*' at Division of Agricultural Extension Education, Sher-e-Kashmir University of Agricultural Sciences & Technology of Jammu Main Campus, Chatha Jammu from 8 to 10 January 2015.

Mr. Bhoopendra Singh attended Winter School on "Recent advances in Crop Management under protected Cultivation" at Centre for Protected Cultivation Technology, IARI, New Delhi from 26 Dec 2014 to 15 Jan 2015.

Dr. P Samal attended a meeting regarding preparation of policy report on *kharif* crops for the 2015-16 season at Krishi Bhavan, New Delhi on 16 January 2015.

Mr. Manish Kumar attended in National Conference on "Indigenous Innovation and Foreign Technology Transfer in Fertilizer Industry: Needs, Constraints and Desired Simplification" and poster presented on the topic of 'Effect of potash on potato production and productivity' organized by the Society of Fertilizers and Environment and Raman Centre for Applied and Interdisciplinary Sciences in collaboration with ICAR- CRJAF, Kolkata on 17 January 2015.

Dr. VK Singh participated and presented progress report of KVK, Koderma and highlighted the future plan of work for last quarter at BAU, Ranchi on 23 January 2015. Dr. VK Singh participated in meeting of KVKs of Jharkhand and other ICAR institutes at IINRG, Ranchi on 24 January 2015.

Drs Mukund Variar and Dipankar Maiti attended and delivered lead lectures on Blast of rice and AM-fungi for upland rice respectively in National Symposium on "Advances in Phytopathological Research in Globalized Era with Reference to Eastern Region" at Dept. of Botany, Ranchi University on 29 January 2015.

Dr. Yogesh Kumar delivered a lecture on 'Frontier Technology for profit maximization in rice' in '*Agriculture Varta*' organized by CSR unit, TATA Steel, Jamshedpur, Jharkhand on 29 January 2015.

Dr. Totan Adak Attended National Symposium on "Agrochemicals for Food and Environment Safety" and presented a paper on 'Effect of rice husk biochar and fly ash on fipronil sorption' at IARI, New Delhi from 28 to 30 January 2015.

Dr. Mukund Variar attended the SAC of KVK Nawada (8-9 January) and KVK, Hazaribag (9 February 2015) as ICAR representative.

Drs. KB Pun and T Singh attended Scientific Advisory Committee meeting of Krishi Vigyan Kendra, Assam Agricultural University, Nalbari on 30 January 2015.

Dr. SM Prasad attended and delivered a talk on "*Production technology of potato*" in a farmers training programme organized by Project Director, Watershed, Cuttack at village Mangarajpur, Tangi-Choudwar on 4 February 2015.

Dr. T Mohapatra, Director, CRRI attended the XII Agricultural Science Congress at NDRI, Karnal from 3 to 6 February 2015. Drs. B Mondal, Lipi Das, T singh and Smt. Sujata Sathy participated and presented a paper during the Agricultural Science Congress-2015 on 'Credit demand by small-scale rice farmer in Odisha: An assessment' and 'Sustainable livelihood security for small holder framers', respectively.

Dr. RK Mohanta attended HRD programme for scientists of Home Science, Animal Science and Fisheries in KVKs of Odisha at OUAT, Bhubaneswar from 6 to 8 February 2015.

Dr. MK Bag attended and presented a paper on "Management of rice sheath blight disease through strobilurins compound: a new generation bio-rational fungicide" in Agriculture and Technology sub-congress of 10th All India Peoples' Technology Congress at Rajabazar Science College, Calcutta University, from 6 to 7 February 2015.

Dr. VK Singh attended in SAC meeting of KVK (Holy Cross), Hazaribag on 9 February 2015.

Dr. M Sahid attended International Conference on "Natural Resource Management for Food Security and Rural Livelihoods" at New Delhi from 10 to 13 February 2015 and presented a paper entitled "Transformation of Zn in rice soil and its availability and uptake to rice crop under flooded and aerobic moisture regime".


Drs. Dipankar Maiti and CV Singh attended the Farm School organized by ATMA at Hazaribag as resource persons and delivered lectures to the Extension personnel on 'Rice IPM' (12 February 2015) and 'Rice production technology' (13 February 2015), respectively.

Dr. T Mohapatra, Director, CRRI attended an Interaction and Inspiration Programme of Odisha Bigyan Academy for +2 Science Lecturers and Students of Odisha and delivered a lecture on "Food Security" at Utkal University, Vanivihar, Bhubaneswar on 12 February 2015.

Dr. T Mohapatra, Director, CRRI attended a workshop in the training institute of Agriculture Department and delivered a lecture on "Women's Role and Responsibility in Managing Natural Resources" at Training Institute, Minor Irrigation & Water Use, Baramunda, Bhubaneswar on 13 February 2015.

Dr. Yogesh Kumar delivered a lecture on 'Cultivation of rice, pulses and oilseeds crops in Jharkhand' in the *Kisan Mela* organized by RK Mission Research Farm, Angada, Ranchi on 13 February 2015.

Dr. T Mohapatra, Director, CRRI attended the 4th International Global Social Science Conference-2015 and



Drs. BN Sadangi, SK Mishra and Lipi Das participated and presented papers in the Global Social Science Conference (GSSC-2015) on the theme “Management of Sustainable Livelihood Systems” at OUAT, Bhubaneswar from 14 to 17 February 2015.

Dr. T Mohapatra, Director, CRRI attended the Agricultural Genomics Symposium and delivered a lecture on “Our Experience in Rice Genomics: Structure to Function” at TNAU, Coimbatore on 16 February 2015.

Dr. Yogesh Kumar delivered a talk on ‘Traditional plant varieties in crop improvement’ at Krishi Vigyan Kendra (Koderma), Jainagar, Jharkhand on 18 February 2015.

Dr. T Mohapatra, Director, CRRI attended the 5th International Conference on Next Generation Genomics and Integrated Breeding for Crop Improvement and delivered a lecture on “Exploring Salinity Tolerance in Rice by Genome wide Approaches” at ICRISAT, Hyderabad from 19 to 20 February 2015.

Dr. SM Prasad attended Regional Agricultural Fair, 2015 from 19 to 21 February 2015 at CPRS, Patna and delivered a talk on “Rice varieties suitable for different ecologies of Eastern India and their production technologies”.

Dr. Yogesh Kumar delivered a lecture on ‘Improved varieties of rice suitable under DSR and cultivation of *rabi* pulses and oilseed crops under rice fallow area in Jharkhand’ in the ‘*Kisan Mela*’ organized by Dept. of Agriculture, Govt. of Jharkhand at block Office, Mandu, Hazaribag, Jharkhand on 20 February 2015.

Dr. T Mohapatra, Director, CRRI attended the 17th Indian Agricultural Scientists and Farmers’ Congress on “Agri-Innovation for Enhancing Production and Rural Employment” at Bioed Research Institute of Agriculture & Technology, Allahabad from 21 to 22 February 2015.

Dr. T Mohapatra, Director, CRRI attended the 1th Annual Conference of the Society of Statistics, Computer and Applications and delivered a lecture on “Genome wide Analysis using Bioinformatic Tools: Adding Value to Rice Genomic Resources” at Birla Institute of Management Technology, Bhubaneswar on 23 February 2015. Dr. P Samal attended and presented a paper on ‘Socioeconomic Aspect of Rice Cultivation in Eastern India’.

Dr. T Mohapatra Director, CRRI attended Institute Management Committee meeting of NRCPB, New Delhi on 23 February 2015.

Dr. KB Pun attended Institute Management Committee meeting of National Centre for Integrated Pest Management, New Delhi on 24 February 2015.

Drs. P Samal attended 17th Annual Conference of Society for Statistics and Computer Applications’ at Birla Institute of Management Technology, Bhubaneswar on 23 February 2015 and presented a paper on ‘Socioeconomic aspect of rice cultivation in Eastern India’.

Drs. Biswajit Mondal and NN Jambhulkar attended ‘17th Annual Conference of Society for Statistics and Computer Applications’ at Birla Institute of Management Technology, Bhubaneswar from 23 to 25 February 2015. Dr. Mondal presented a paper on ‘Measuring the impact of watershed development programmes: scopes and limitations’ and Dr. Jambhulkar presented a paper on ‘Minimum aberration fractional factorial plans for mixed-level experiments’.

Dr. VK Singh attended in ISEE National Seminar Extension Innovations and Methodologies for Market – Led Agricultural Growth and Development at RVSKVV, Gwalior from 26 to 28 February 2015.

Dr. SM Prasad attended RPSC meeting of AIR, Cuttack on 27 February 2015.

Dr. M Chourasia attended e-pest surveillance training at Salepur block office organized by DAO, Salepur for 50 farmers on 27 February 2015.

Dr. RK Mohanta attended a 3 day training programme organized at Block Office, Tangi-Choudwar for selected farmers/farm women and delivered lectures on “*Role of Goat Nutrition in Profitable Goat Farming*” on 27 and 28 February 2015.

Dr. Dipankar Maiti attended the workshop organized on 28 February 2015 as a part of National Science Day celebration by the Dept. of Botany, Vinoba Bhave University, Hazaribag and delivered key note address on the focal theme: Developing winning research project proposals.

Dr. Yogesh Kumar participated in project launching workshop on ‘Livelihood food security for Churchu block’ organized by SUPPORT and CINI at Hotel Canary Inn, Hazaribag, Jharkhand on 3 March 2015.

Dr. T Mohapatra, Director, CRRI attended and delivered a lecture in the First SRM Genetics Congress at Department of Genetic Engineering, SRM University, Kattankulattur, Chennai on 4 March 2015.

Dr SM Prasad attended video conferencing programme at Collectorate, Cuttack on 9 March 2015 on the National Mission of Agricultural Extension and Technology for states of East India (Bihar, Chhatisgarh, Jharkhand, Odisha and West Bengal).

Dr. T Mohapatra, Director, CRRI attended and delivered a lecture at NCIPM, New Delhi on 10 March 2015.

Mr. Bhoopendra Singh attended in BGREI meeting, at ATMA, Koderma, Jharkhand on 11 March 2015.

Dr. SM Prasad attended PUSA Krishi Vigyan Mela 2015 at IARI, New Delhi from 10 to 12 March 2015 along with eleven progressive farmers from different block of Cuttack district.

Drs. PC Rath and S Lenka attended and presented oral research papers on ‘Impact of climate change on insect pest of rice in India’ and ‘Field efficacy of new fungicide molecules against sheath blight disease in rice caused by *Rhizoctonia solani* Kuhn’, respectively, in 8th National Seminar on climate change impact and sustainable management strategies at Ravenshaw University, Cuttack from 14 to 16 March 2015.

Dr. S Lenka attended the meeting on preparation of Action Plan of BGREI for the year 2015-16 at Directorate of Agriculture and Food Production, Bhubaneswar on 17 March 2015 as a member DLMT for Koraput district of Odisha.

Dr. VK Singh attended two days workshop on ‘Attracting and retaining Youth in Agriculture (ARYA) project’, at NAARM, Hyderabad from 11 to 12 March 2015.

Dr. VK Singh deliver a talk on 19 March 2015 on ‘Leadership development in extension functionaries’ in a three days training programme for extension personnel organized by SAMETI, Jharkhand at KVK, Koderma from 18 to 20 March 2015.

Dr. U Kumar delivered a talk on “Beneficial microbes: A sustainable solution for food security” in National seminar at M.S. Swaminathan School of Agriculture (CUTM), Paralakhemundi, Odisha on 28 March 2015.

Publications

Research/Review Papers

1. Behera BK, Das P, Maharana J, Paria P, Mandal SN, Meena DK, Sharma AP, Jayarajan R, Dixit V, Verma A, Vellarikkal SK, Scaria V, Sivasubbu S, Rao AR and Mohapatra T. 2015. Draft genome sequence of the extremely halophilic bacterium *Halomonassalina* strain CIFRI1, isolated from the East Coast of India. *Genome Announcements*, **3**(1): e01321-14.
2. Kalra BS, Mondal B and Sarangi A. 2015. Technical efficiency of wheat and paddy farms in irrigated saline environment in Haryana State, India: An assessment. *African Journal of Agricultural Research*. **10**(7): 637-644.
3. Kumar V, Singh A, Mithra SVA, Krishnamunrthy SL, Parida SK, Jain S, Tiwari KK, Kumar P, Rao AR, Sharma SK, Khurana JP, Singh NK and Mohapatra T. 2015. Genome-wide association mapping of salinity tolerance in rice (*Oryza sativa*). *DNA Research*, **1-13**. Doi: 10.1093/dnares/dsu046.
4. Mondal B and Nalatwadmath SK. 2014. How much is a watershed worth? An assessment. *Indian Journal of Soil Conservation*. **42**(3): 322-327.
5. Gangopadhyay PR, Bag KK, Roy MK, Bhardwaj AR and Dutta M. 2015. Evaluation of cucumber germplasm for agronomic traits and disease resistance and estimation of genetic variability. *Indian Journal of Agricultural Sciences*. **85**(2): 234-239.
6. Prasanna R, Babu S, Bidyarani N, Kumar A, Triveni S, Monga D, Mukherjee AK, Kranthi S, Gokte-narkhedkar N and Adak A. 2015. Prospecting cyanobacteria-fortified composts as plant growth promoting and bio-control agents in cotton. *Experimental Agriculture*. **51**(01): 42-65.
7. Rath PC. 2014. Field efficacy of granular insecticides against rice gundhi bug and yellow stem borer. *Indian Journal of Plant protection*. **42**(3): 208-210.
8. Sadangi, BN, Dash HK, Mishra Sabita. 2014. Involving village level para extension worker (UPEW) to address gender issues in extension. *International Journal of Extension Education*. **10**: 45-51.
9. Tiwari KK, Singh A, Pattnaik S, Sandhu M, Kaur S, Jain S, Tiwari S, Mehrotra S, Anumalla M, Samal R, Bhardwaj J, Dubey N, Sahu V, Kharshing GA, Zeliang PK, Sreenivasan K, Kumar P, Parida SK, Mithra SVA, Rai V, Tyagi W, Agrawal PK, Rao AR, Pattanayak A, Chandel G, Singh AK, Bisht IS, Bhat KV, Rao GJN, Khurana JP, Singh NK and Mohapatra T. 2015. Identification of a diverse mini-core panel of Indian rice germplasm based on genotyping using microsatellite markers. *Plant Breeding*. DOI: 10.1111/pbr.12252.

Book Chapters

1. Imam J, Mukesh N, Toppo NN, Mandal NP, Kumar Y, Variar M, Bandopadhyay R and Shukla P. 2014. Rice Informatics: A comprehensive overview on application

of bioinformatics and computational statistics in rice genomics towards an amalgamated approach for improving acquaintance base. In: Kavi Kishor PB, Rajib Bandopadhyay and Prashanth Suravajhala (Eds.) *Agriculture Bioinformatics*. Springer, New Delhi, India: 89-107.

2. Rath J and Dangar TK. 2014. Osmotolerant microbial resources of saline ecologies of India: Dynamics and potential. In: DK Maheswari (Ed) *Bacterial diversity in sustainable agriculture: Sustainable development and biodiversity*, vol. 1, Springer Int Publ, Switzerland: 265-303.
3. Sahoo B, Ranjan A, Mohanta RK and Chandrakar A. 2015. Area specific mineral mixture for optimum livestock health and production. In: PK Singh, R Kumar, S Kumar and K Kumar (Eds.) *Feed Supplements for Livestock and Poultry*. Daya Publishing House, New Delhi: 233-257.

Popular Articles

1. Lenka S, Pradhan SK, Rath PC and Dash SK. 2015. Krushi khetrare rasayanika kitanasaka oushadha prayoga bele sabadhanata. *Krushak Sambad*. February, 2015, 7: 8.
2. Mondal B, Sinha MK and Suresh Kumar D. 2014. Microfinance initiatives in India: Current status and way ahead. *Ashwaththa*, **8**(2&3): 19-23.

Technology Bulletins

1. Dash SK, Pradhan SK, Kar MK, Patnaik SSC, Behera L, Meher J, Anandan A, Marandi BC, Lenka S, Chattopadhyay K, Singh ON and Mohapatra T. 2015. *CRRI Rice Varieties for Diverse Ecologies*. CRRI Technology Bulletin No. 106, Cuttack, India.
2. Singh CV, Mandal NP, Maiti D, Variar M, Kumar Y and Anantha MS. 2015. *Production technology for direct seeded rice cultivation in rainfed areas of eastern India*. ICAR-Central Rainfed Upland Rice Research Station. CRURRS Technology Bulletin No. , Hazaribag, India.

Extension Bulletins

1. Chourasia M, Behera KS, Das KM, Prasad SM, Sahoo TR, Sarangi, DR and Sethy S. 2015. Management of Rice Pest and Diseases. Central Rice Research Institute Extension Bulletin No.4.
2. *ଅନୁପମ ସମ୍ପାଦନା କମିଟିର ପ୍ରତିବନ୍ଧବୀ ସମୀକ୍ଷା*, ବର୍ଷ (୧୦) ୧୫୬, ନଭେମ୍ବର ୧୯୯୦-୧୯୯୧
3. *ଓଡ଼ିଶା ରାଜ୍ୟର ଉପକୂଳ ପର୍ଯ୍ୟନ୍ତ, ବର୍ଷ (୧୦) ୧୫୬, ଅନୁପମ ସମ୍ପାଦନା କମିଟିର ପ୍ରତିବନ୍ଧବୀ ସମୀକ୍ଷା*

Retirement

Shri Akadasi Mallick, T-3 and Shri J Terrom, T-9 retired on 31 January 2015.

Shri Gadadhar Rout, SSS retired on 28 February 2015.

Shri Sarat Kumar Behura, T-5 and Shri SKA Samad, T-5 retired on 31 March 2015.



Shri Mallik with the Director and CRRI staff

ଓଡ଼ିଆ ଖବର

ଶ୍ରୀ ଆକାଶୀ ମଲିକ୍, ଡି-୩ ଏବଂ ଶ୍ରୀ ଜି ଡିରମ୍, ଡି-୯ ୩୧ ଜାନୁଆରୀ ୨୦୧୫ରେ ଅବସର ଗ୍ରହଣ କରିଥିଲେ।

ଶ୍ରୀ ଗାଦାଧର ରୂତ, ଏସ୍‌ଏସ୍‌ଏସ୍ ଅବସର ଗ୍ରହଣ କରିଥିଲେ।

ଶ୍ରୀ ସରାଟ କୁମାର ବେହୁରା, ଡି-୫ ଏବଂ ଶ୍ରୀ ସ୍କା ସାମାଦ, ଡି-୫ ୩୧ ମାର୍ଚ୍ଚ ୨୦୧୫ରେ ଅବସର ଗ୍ରହଣ କରିଥିଲେ।



Shri Rout in the midst of the Director and CRRI staff



Shri Behura and Shri Samad along with the Director and CRRI staff

ICAR Inter-Zonal Sports Tournament

The ICAR-CRRI Sports Contingent participated in the ICAR Inter-Zonal Sports Tournament held at ICAR-NDRI, Karnal from 11 to 14 March 2015. The ICAR-CRRI Kabaddi team maintained its winning streak and retained the championship. In individual events, CRRI won first and third position in 400 m race (men) and secured second position in 100 and 200 m race (men) and Javelin throw (women). The team also finished third in 800 m race (men) and 4 x 100 m relay race. Dr. R. Raja was the Chief-de-Mission and Shri. R. K. Behera the Manager.



ଓଡ଼ିଆ ଖବର

ଓଡ଼ିଆ ଖବର: ଶ୍ରୀ ଆକାଶୀ ମଲିକ୍, ଡି-୩ ଏବଂ ଶ୍ରୀ ଜି ଡିରମ୍, ଡି-୯ ୩୧ ଜାନୁଆରୀ ୨୦୧୫ରେ ଅବସର ଗ୍ରହଣ କରିଥିଲେ। ଶ୍ରୀ ଗାଦାଧର ରୂତ, ଏସ୍‌ଏସ୍‌ଏସ୍ ଅବସର ଗ୍ରହଣ କରିଥିଲେ। ଶ୍ରୀ ସରାଟ କୁମାର ବେହୁରା, ଡି-୫ ଏବଂ ଶ୍ରୀ ସ୍କା ସାମାଦ, ଡି-୫ ୩୧ ମାର୍ଚ୍ଚ ୨୦୧୫ରେ ଅବସର ଗ୍ରହଣ କରିଥିଲେ।

ଓଡ଼ିଆ ଖବର: ଶ୍ରୀ ଆକାଶୀ ମଲିକ୍, ଡି-୩ ଏବଂ ଶ୍ରୀ ଜି ଡିରମ୍, ଡି-୯ ୩୧ ଜାନୁଆରୀ ୨୦୧୫ରେ ଅବସର ଗ୍ରହଣ କରିଥିଲେ। ଶ୍ରୀ ଗାଦାଧର ରୂତ, ଏସ୍‌ଏସ୍‌ଏସ୍ ଅବସର ଗ୍ରହଣ କରିଥିଲେ। ଶ୍ରୀ ସରାଟ କୁମାର ବେହୁରା, ଡି-୫ ଏବଂ ଶ୍ରୀ ସ୍କା ସାମାଦ, ଡି-୫ ୩୧ ମାର୍ଚ୍ଚ ୨୦୧୫ରେ ଅବସର ଗ୍ରହଣ କରିଥିଲେ।

