Fruitful partnerships for improving disease resistance in groundnut

In a first of its kind, introgression lines using Marker Assisted Backcross Breeding (MABC) for foliar fungal disease resistance have been bred in groundnut. This distinction was achieved in collaboration with Indian National Agricultural Research System (NARS) partners. Foliar fungal diseases, like rust and leaf spot, in groundnut account for 15% losses in Asia and 20% each in Eastern and Southern Africa and West and Central Africa. Cultivation of disease resistant varieties will result in enhanced groundnut production, improved livelihoods, nutritional wellbeing, as well as additional income to farmers from use of haulms as fodder.

Three popular groundnut varieties – ICGV 91114, JL 24 and TAG 24 – were improved for foliar fungal disease resistance. ICGV 91114 is a drought tolerant variety, and JL 24 and TAG 24 are widely cultivated in India. JL 24 is also popular in Africa.

Combining disease resistance with early maturity in groundnut is the most significant outcome of precision breeding approach using MABC. In a preliminary evaluation trail, the introgression lines recorded a pod yield increase of 20-96% over their respective recurrent parents, and a disease score similar to resistant donor GPBD 4.

The project was developed by Dr AL Rathnakumar, Principal Scientist, Directorate of Groundnut Research (DGR) and Dr P Janila, Senior Scientist - Groundnut Breeding, ICRISAT.
Improving disease resistance in groundnut...

“This is a great opportunity to deliver science innovations to farmers. I look forward to include MABC trials in national testing by the All India Coordinated Research Project on Groundnut,” said Dr Radhakrishnan, Director, DGR.

About 57 introgression lines will be tested in the 2015 rainy season in six major groundnut growing states (Gujarat, Tamil Nadu, Andhra Pradesh, Karnataka, Maharashtra and Telangana) in India. Researchers from DGR, state agricultural universities and ICRISAT will collaborate to conduct the multilocation trials.

Multilocation evaluation of MABC lines will help identify promising introgression lines for recommendation to state and national varietal release trials and subsequently released for cultivation.

Project partners: Directorate of Groundnut Research, Junagadh; Agricultural Research Station (ARS), Kadiri of Acharya N G Ranga Agricultural University; Tamil Nadu Agricultural University; ARS, K Digraj, Sangli and Oilseeds Research Station, Jalgoan of Mahatma Phule Krishi Vidyapeeth; University of Agricultural Sciences, Dharwad and ICRISAT (Project Coordination).

This project is supported by the CGIAR Research Program Grain Legumes competitive grants scheme.

Project title: Establishment of participatory on-farm demonstration for new crop varieties in Nigeria

Principal Investigator: H Ajeigbe
Investor: Catholic Relief Services (CRS) (USAID funded)

Scope of work:

- Establishment of demo farms for millet, sorghum, cowpea and groundnut using at least three new varieties and showcasing at least three proven and best agronomic practices in Sokoto state
- Design and delivery of trainings for field agents, extension agents, lead farmers and agro-dealers on improved production practices
- Set-up community seed production and facilitate certification of different classes of seed production through targeted Field Agents (FAs) to support lead farmers
- Training of FAs in Federal Capital Territory on processing and linkages to post-harvest technologies
- Training of extension agents on bio-reclamation of degraded land

Project partners came together at a work plan meeting held on 12 January at DGR, Junagadh.

For more information on groundnut visit http://exploreit.icrisat.org/page/groundnut/686

Reader’s comment

Thank you for the newsletter with lot of information on GreenPHABLET, SAT Insect Museum and other interesting details.

GreenPHABLET would become vital in the process of technology transfer to marginal/small and medium farmers in rainfed agriculture. This is an important change in ICT and will play a key role in faster transfer of technology to farmers. I am sure the clientele would increase rapidly in the next couple of years.

The insect museum is also an important addition which will be useful to many research workers.

– Mr Maruthi Sankar

Announcement

The SAT Insect Museum will be open to ICRISAT staff between 10:00 to 10:30 hours on 20 January. Those desirous of visiting the museum can do so, with due permission from their supervisors.
ICRISAT supplies bulk of chickpea breeding material in India

Chickpea varieties based on breeding material supplied by ICRISAT had a share of 49% of chickpea breeder seeds in India for 2014-15 season. Forty varieties have been released in India from ICRISAT breeding material.

At a recent Chickpea Scientists’ Meet the research progress made at ICRISAT over the last two years was presented by Dr Pooran Gaur, Assistant Research Program Director, Grain Legumes, ICRISAT.

“India has made excellent progress in chickpea production in recent years and the varieties developed by ICRISAT in partnership with the Indian Council of Agricultural Research (ICAR) have been widely adopted and are making an important contribution to India’s mission of achieving self-sufficiency in pulses production,” said Dr NP Singh, Director, Indian Institute of Pulses Research (IIPR), Kanpur.

Dr Rajeev Varshney, Research Program Director Grain Legumes, emphasized on integrating modern breeding methods in chickpea improvement for enhancing genetic gain.

“The benefits of the ICAR-ICRISAT partnership should go beyond India to other countries, particularly in Africa. We should tackle the challenges that constrain the production of chickpea and offer solutions to smallholder farmers globally,” said Dr David Bergvinson, Director General, ICRISAT.

Dr Peter Carberry, DDG-Research, appreciated the efforts of chickpea scientists in developing varieties with enhanced yield potential. He said that the chickpea model that he developed for APSIM (Agricultural Production Systems sIMulator) under-predicts the yields as the new varieties have higher genetic potential for yield.

Dr Sushil K Chaturvedi, Head (Crop Improvement), IIPR, on behalf of Project Coordinator, All India Coordinated Research Project (AICRP) on Chickpea, presented the highlights of AICRP on chickpea and the priorities for the 12th Five-Year Plan of the Government of India.

The major objectives of this meet were: (1) to bring together chickpea scientists from Indian NARS and ICRISAT for sharing knowledge on recent developments in chickpea research, and (2) to provide opportunity to scientists from Indian NARS for selecting breeding materials and germplasm of their interest from the fields at ICRISAT.

The Meet organized at ICRISAT-India was attended by about 60 scientists, including 29 scientists from Indian NARS.

This activity was undertaken under the CGIAR Research Program on Grain Legumes. For more information on chickpea visit [http://exploreit.icrisat.org/page/chickpea/685](http://exploreit.icrisat.org/page/chickpea/685).

Inauguration

An ‘Innovations Lab’ of the Center of Excellence in ICT Innovations for Agriculture was launched on 15 January. Speaking at the launch, Dr David Bergvinson, Director General ICRISAT, emphasized on the urgent need to translate the digital revolution in agriculture into a reality at ICRISAT. “We urgently need some tools to do our work more efficiently and this facility can be an incubator for great ideas to support our work across programs. I encourage it to be used by external partners to host hackathons,” he said. The lab is located in the Stein W Bie Knowledge Sharing Innovation wing at ICRISAT-India.
Meetings with DG-ICAR, Secretary Agriculture and Chief Secretary, Telangana

Dr David Bergvinson, ICRISAT Director General recently met Dr S Ayyappan, Director General, Indian Council of Agricultural Research, (ICAR) in New Delhi, India. They discussed the need for deepening the partnership with ICAR and the Indian National Agricultural Research System to advance market-led innovations and to promote science based development. The need for a greater emphasis on agri-incubators to promote entrepreneurship in agriculture was also discussed.

In a separate meeting with Mr Ashish Bahuguna, Secretary, Department of Agriculture and Cooperation, Government of India, Dr Bergvinson discussed the Prime Minister of India Mr Narendra Modi’s call for a ‘Digital India’ and strategies for translating it to agriculture. Overarching digital innovations to improve the lives of smallholder farmers was discussed.

Dr Bergvinson was accompanied by Dr Peter Carberry, Deputy Director General-Research, ICRISAT, Dr CLL Gowda, ex-DDG-R and Dr G Narendra Kumar, Director Country Relations and Business Affairs.

Dr Bergvinson met Mr Rajiv Sharma, Chief Secretary, Government of Telangana, recently in Hyderabad, India.

Dr Bergvinson expressed his appreciation for the strong support received from the Government of Telangana and the long fruitful association with the Government, universities and various research institutions in the state. He reiterated ICRISAT’s commitment to apply demand-driven innovation to serve the needs of smallholder farmers and their families in the state.

Dr Bergvinson was accompanied by Dr Carberry and Mr SS Sharat Kumar, Director Human Resources and Operations, ICRISAT.

Welcome

Dr Rajeev Gupta, an American national, joined on 12 January as Principal Scientist–Applied Cereals Genomics, Research Program– Dryland Cereals, ICRISAT-India.

Dr Gupta has a PhD in Plant Molecular Biology from University of Cambridge, UK. Prior to joining ICRISAT, he was Research Scientist (Lead) at DuPont Pioneer, USA, since 2003. He also worked at the University of California, Berkeley, USA during 1997-2003 as Post-doctoral Researcher and Assistant Specialist.

He worked as Research Fellow at the Punjab Agriculture University (PAU) and as Agriculture Development Officer, Punjab State Government, India during 1991-1993.

We welcome Dr Gupta and his family and wish them all success.