

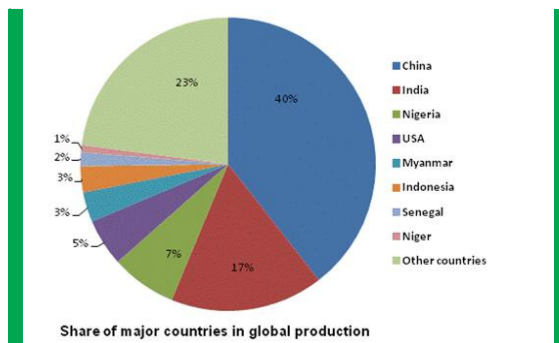


Global groundnut scenario: India vs. other nations

The triennial average data (2011-2013) of area, production and yield indicate that annually 421 lakh tonnes of groundnut are produced in the world from a cropped area of 249 lakh ha with an average productivity of 1688 kg ha⁻¹. Though, considering the cultivated area (51.1 lakh ha), India ranks first, followed by China and Nigeria, the production and yields are comparatively less. In

comparison, China holds the most promising figure in production (166.3 lakh tonnes) and USA in yield (4.3 t ha⁻¹) of groundnut. Consequently, China had maximum share (approx. 40%) followed by India (approx. 17%) in global groundnut production. Other Asian countries like Myanmar and Indonesia cultivate

groundnut in far less areas than India, however the yield values recorded were higher than India over the last three years. Among the African countries, Nigeria contributed a fair share of total global production (7.2%) over Senegal and Niger. Declining areas under cultivation, lesser spread of improved cultivars and production technologies among farmers and unpredictable climatic variability can be highlighted as production constraints of groundnut in India.



Triennial (2011-2013) average of area, production and yield of major groundnut producing countries

Country	Area (lakh ha)	Production (lakh tonne)	Yield (kg ha ⁻¹)
China	46.7	166.3	3562
India	51.1	70.4	1367
Nigeria	23.7	30.1	1268
USA	5.0	22.0	4330
Myanmar	8.9	13.8	1560
Senegal	7.8	6.4	827
Indonesia	5.4	12.0	2234
Niger	7.2	3.2	452
World	249.3	420.9	1688

Source: FAOSTAT
(Input: Debarati Bhaduri and K. Chakraborty)

PBS 29148: A new source for confectionery traits in groundnut

The groundnut genotypes which possess low oil, high protein content, high O/L ratio, high sugar content, low free amino acids, etc. along with large seed size are considered as confectionery type. An advanced breeding line PBS 29148 of Virginia bunch habit group has been identified as a source of confectionery traits. Its kernels have low oil content (44.2%), and high protein content (35.8%). Other biochemical constituents observed are sugar content (5.5%), free amino acids (1.7 mg/g) and

phenols (2.5 mg/g). Its kernel size is large with 67g hundred kernel weight and having length and width of kernel as 19.1 and 10.6 mm, respectively. The yield of this genotype was 1567 kg pods per hectare with 42.3% harvest index and 67% shelling outturn. This genotype may be used in further breeding programme for low oil, and high protein content and large seed size.

(Inputs: M.C. Dagla, Narendra Kumar, Ajay B.C. and M.K. Mahatma)

A new fungus-induced gene identified in groundnut

Plants produce cell wall-associated polygalacturonase-inhibiting proteins (PGIPs), whose over expression improve the resistance to fungal and bacterial necrotrophs in different plants by inhibiting the polygalacturonases (PGs), the cell wall degrading enzyme produced by the pathogens. The PG-PGIP interaction limits the aggressive potential of PGs, favours the accumulation of elicitor-active oligogalacturonides in the apoplast and causes the activation of defense responses. PGIPs are encoded by small gene families, identified in several plants including oil seed crops such as soybean, bean, and mustard; however no reports were available for groundnut. Hence an attempt was made to identify a gene for PGIP like protein in groundnut. Using a set of degenerate primers, a sequence of about 600 bp length was cloned from cDNA synthesized from stem rot infected groundnut

leaf tissues. Sequence analysis confirmed that the sequence has distinct but very closely related DNA sequences to the earlier reported PGIP gene sequences. For the first time, a partial sequence of fungal induced PGIPs gene family in groundnut has been submitted to NCBI database (Acc. No. KP844637). The temporal expression profiles of the gene revealed its comparatively early induction in susceptible than that of tolerant genotypes. Further the gene expression showed a distinct variation among genotypes. The study suggests the probable role of the gene in defense against stem rot disease in groundnut; hence further a detailed study for the characterization and mode of action of PGIP can be made to use it as a candidate gene against the fungal diseases in groundnut.

(Inputs: Sujit K. Bishi, Dinesh D. Vakharia and Mahesh K. Mahatma)

Sporadic incidence of *Spodoptera litura* in summer groundnut

The tobacco caterpillar, *Spodoptera litura* (Fab.), a major defoliator pest of groundnut generally occur in rainy season crop. Apart from groundnut it has been known to feed on 40 species of cultivated crops in India. It has been reported to inflict yield losses up to 55% in groundnut during kharif. Rarely incidence can be seen during the summer crop. Overlapping generations of *S. litura* was seen where the different stages of life cycle were found in the groundnut field at same time. The larvae were found near the base plants during day time and defoliate during night time. It has been observed



Spodoptera larva feeding on leaflet

that the moth activity was severe and the male moth catches in the pheromone traps ranged between 9 and 12 moths/ trap/ week. A survey was conducted during summer 2015 in groundnut fields of Saurashtra region. Foliar damage was observed in the range of 8-15% in

the farmer's field at different talukas of Junagadh, Gir-Somnath, Porbandar, Rajkot and Amreli. The possible reasons for the sporadic incidence of *S. litura* may be due to the summer showers received during 11th standard week i.e., second week of March, 2015 coupled with the favourable range of temperatures (20 to 39 °C). There was no such incidence reported in the past three years of survey.

(Input: Nataraja M V, Jadon K S and Thirumalaisamy P P)

Foliar damage in different talukas of Saurashtra

Taluka	Foliar damage (%)
Junagadh	12.0
Manavadar	08.0
Mendarada	13.0
Dhoraji	08.0
Bagasara	10.0
Bilkha	11.0
Amreli	10.0
Vadiya	12.0
Talala	10.0
Kodinar-Una	15.0

National Science Day-2015

The week-long activities for the National Science Day celebration at DGR started on 20th February' 2015. The theme for this year's Science Day celebration was "Science for Nation Building". Several competitions were held for school children of Junagadh and the staff of DGR to mark the National Science Day celebrations. A total of 174 students from 11 different schools participated in the week long science day celebrations involving 5 competitive events. An Elocution competition (English, Hindi and Gujarati) for students of 6th-9th standard was held on 20-2-15. The topic for Elocution Competition was "Science for Nation Building". A total of 30 students belonging to 11 schools participated in the Elocution Competition. An Essay writing competition (English, Hindi and Gujarati) for students of 6th-9th standard was held on 21st February 2015. The topic for Essay writing competition was "Role of Science in Nation Building". A total of 32 students belonging to 11 schools participated in the Essay Writing Competition. A quiz competition on 'general awareness about science and general knowledge' was held on 23rd February 2015 for the staff of DGR. 31 DGR staff participated in the event.

A Science Exhibition (model competition) for students of 6th-9th standard was held on 24th February 2015. The topic for the competition was "Innovative Farming Systems". A total of 28 students belonging to 7 schools participated in the Science Exhibition. A painting competition for



National Science Day celebrations at ICAR-DGR

students was organized on 26th February 2015. The theme for painting competition was "Smart City". A total of 29 students belonging to 10 schools participated in the painting competition. An Essay writing competition (English, Hindi) for the staff of DGR was held on 27th February 2015. The topic for Essay writing competition was "Role of Science in Nation Building". A total of 16 DGR staff members participated in the essay writing competition. Two science quiz competitions were organized on 28th February (one for students of 6th-7th standard and another for students of 8th-9th standard). A total of 11 school teams comprising of 3 students in each team participated in the quiz.

The events were conducted with great success and enthusiasm from the participants. The prize distribution ceremony was held on 28th February, 2015. Dr. Radhakrishnan, T. Director DGR, presented the prizes to the participants. Dr. Sandeep Kumar, DCF, Gir Forest was the chief guest. A beautiful presentation on wild life was made by him on the occasion.

Launch meeting of CGIAR-CG funded project

(Junagadh, 12 January, 2015)

The launch meeting of CGIAR-CG funded project entitled "Multi-location evaluation of MABC derived disease resistant groundnut lines" was held on 12th January 2015 at ICAR-DGR, Junagadh. 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. This is first ever evaluation of MABC groundnut lines, developed for foliar-fungal disease resistance, through AICRP-G in India.

A total of six national and one international (ICRISAT, Patancheru, Hyderabad, Telangana) organizations are the partners in this project. Among national, ICAR-DGR, Junagadh is the lead institution and five AICRP-G centres viz. UAS

(Dharwad), TNAU (Aliyarnagar), MPKV (Digraj and Jalgaon) and ANGRAU (Kadiri) are associated as partners in this project. The project was developed by Dr. AL Rathnakumar, Principal Scientist, Directorate of Groundnut Research (DGR) and Dr. P Janila, Senior Scientist - Groundnut Breeding, ICRISAT.

“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. Dr. P. Janila, Groundnut Breeder, ICRISAT briefed about the modus operandi of this project while, Dr. M.K. Pandey, Scientist, ICRISAT informed about background of MABC lines developed at ICRISAT which will be used for multi-location testing at different participating centres through this project. Dr. A.L. Rathnakaumar proposed the work plan for each of the centre, which was finalized after thorough discussions. The meeting ended with the vote of thanks by Dr. Narendra Kumar, Scientist, DGR.

राजभाषा कार्यशाला आयोजन

इस निदेशालय में दिनांक 28 मार्च, 2015 को राजभाषा कार्यशाला का आयोजन किया गया। इस कार्यशाला में कुल 31 अधिकारियों/कर्मचारियों ने भाग लिया। दो संसाधन व्यक्तियों को व्याख्यान देने के लिए आमंत्रित किया गया। श्री ए. एन. भार्गव, स्टेशन प्रबंधक, पश्चिमी रेलवे, जूनागढ़ द्वारा “सरकारी कामकाज में हिंदी का महत्व” विषय पर व्याख्यान दिया गया। यह व्याख्यान काफी रोचक था तथा सरकारी कामकाज में हिंदी से सरलता से कार्य कैसे किया जाये इस पर विस्तृत रूप से चर्चा की गयी। डॉ. के. पी. बाकु द्वारा “हिंदी शिक्षण: दशा एवं दिशा” विषय पर व्याख्यान दिया गया। जिसमें उन्होंने बहुत महत्वपूर्ण जानकारियाँ दी, तथा भारतीय शिक्षा पद्धति में हिंदी के स्तर को अपनाने एवं बढ़ावा देने पर जोर दिया गया। दोनों व्याखानों के बाद प्रतिभागियों से फीडबैक लिया गया। उससे पता चला कि सभी व्याख्यान बहुत ही रोचक एवं जानकारी से परिपूर्ण थे। बाद में हिंदी में काम करने के लिए होने वाली कठिनाइयों पर चर्चा की गयी तथा इन कठिनाइयों को कैसे



दूर किया जाये, पर भी चर्चा की गयी। डॉ. राधाकृष्णन टी. निदेशक एवं अध्यक्ष राजभाषा कार्यान्वयन समिति ने सभी को संबोधित किया एवं डॉ. के. पी. बाकु तथा श्री ए. एन. भार्गव का हार्दिक आभार प्रकट किया, तथा साथ ही सभी उपस्थित अधिकारियों व कर्मचारियों से अपील की कि जितना जिससे हो सके पत्राचार इत्यादि हिंदी भाषा में ही करें। तथा हिंदी में काम करने के लिए आने वाली कठिनाइयों को निरंतर हिंदी कार्यशालाओं के आयोजन द्वारा हल करने का पूरा प्रयास किया जायेगा।

(आदान: मनेश चन्द्र डागला, वैज्ञानिक एवं प्रभारी –हिंदी अधिकारी)

TRAININGS

Three day farmers' training provided on groundnut seed production (02-04 March 2015, Junagadh)

A three day training programme on “सौराष्ट्र में वैज्ञानिक तकनीक द्वारा मूँगफली बीज उत्पादन” was organized at ICAR-DGR, Junagadh from 02-04 March, 2015 under ICAR seed project in which 30 farmers from Bamnasa (Ghed) and Innagar villages of Junagadh, Gujarat participated. All aspects of scientific seed production including improved new groundnut varieties recommended for Saurashtra region, good agronomic practices, integrated management of insect-pests and diseases and post-harvest management of seed and storage were covered by various experts. In addition, farmers were also exposed to various farm-machineries and implements used in the groundnut cultivation. Visit to groundnut seed production plots as well as experimental fields were also arranged during the training programme. Furthermore, reading materials such as training manual, folders, and bulletins pertaining to groundnut seed production and other related



Director, DGR presenting certificates to trainees

aspects were also provided to the farmers. Post-training evaluation indicated that a good amount of technical knowhow about groundnut seed production have been perceived by the farmers. Dr. Radhakrishnan T., Director, ICAR-DGR addressed the farmers and appealed them to contact this Directorate for any technical advice related to groundnut cultivation. The training ended with the presentation of vote of thanks by Dr Narendra Kumar.

MEETINGS

Joint ICAR-ICRISAT partnership project review and planning meeting (04 April, 2015, Hyderabad)

Joint ICAR-ICRISAT partnership project review and planning meeting was held at ICRISAT-Patancheru on 4th April 2015. In his message, Dr. S. Ayyappan, DG, ICAR acknowledged ICRISAT's role in India's programs and initiatives especially for the resource poor farmers. In his opening remarks, Director General Dr. David J. Bergvinson told that the vibrant partnership between ICRISAT and ICAR has led to a synergistic response towards addressing challenges of food and nutritional security, and poverty alleviation for the millions of smallholder farmers of India.

Dr. Radhakrishnan T. (Director, ICAR-DGR) in his presentation told about the development of drought tolerant groundnut varieties and lines;

identification of suitable genotypes for the rice fallows; development of foliar fungal disease resistant and high O/L lines using MAB approach and development and deployment of various genomic tools for biotic and abiotic stress resistance in groundnut.

Drs. B.B. Singh, ICAR-ADG (O&P) and P.S. Carberry, ICRISAT-ADG welcomed the participants and indicated the commitment of both institutions to strengthening R&D collaboration.

The group agreed to have new flagship research projects under following areas: Enhancing the genetic gains for various traits in mandate crops; enhancing the genetic base of the crops and breeding data management.

XVII meeting of Research Advisory Committee (05 –07 May, 2015)

The 17th meeting of Research Advisory Committee was held at ICAR-DGR, Junagadh from 5th-7th May, 2015. The meeting was chaired by Dr. S.K. Patil, VC, Indira Gandhi Krishi Vishwavidyalaya, Raipur. Other members who have participated in the meeting are Dr. Masood Ali (Ex-Director, IIPR, Kanpur), Dr. A.M. Parakhia (Director of Extension Education, JAU), Dr. Radhakrishnan T. (Director, DGR), Ms Hirbaiben I Lobi (Progressive Farmer, Jambur, Junagadh), Shri J.K.B. Gunde (Progressive Farmer, Kolhapur, MH). Dr. R. Dey (PS,

DGR, Junagadh) was the Member Secretary of 17th RAC meeting, Dr. S.K. Bera being on leave.

Presentations on ongoing research projects were made by the PIs or co-PIs which were discussed meticulously and the work plan was customized as per the remarks of the research advisory committee. In their concluding remarks, Chairman and the members of RAC appreciated the research work that has been done at DGR and pointed out the need for improvements/ modifications on certain areas.

DISTINGUISHED VISITORS

Honorable MP (Mirzapur, Uttar Pradesh) Ms. Anupriya Patel

Honorable Member of Parliament from Mirzapur (Uttar Pradesh) Ms Anupriya Patel, visited our Directorate on 29th January, 2015 and took keen interest in the ongoing research activities.



Hon'ble MP Ms Anupriya Patel taking keen interest in the DGR research activities

Visit of dignitaries from ICAR

Dr. J.S. Chauhan, ADG (Seeds), ICAR, New Delhi; Dr. K.E. Lawande, Ex-Vice-Chancellor, Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli and Dr. B. Singh, Director, ICAR-IIVR, Varanasi visited ICAR-DGR, Junagadh on 11th March, 2015 and interacted with the staff of this Directorate.



Visit of DDG (Animal Sciences), Dr. K.M.L. Pathak

Dr K.M.L. Pathak, Deputy Director-General (Animal Sciences), visited ICAR-DGR on 25th March, 2015 and interacted with the DGR staff and shared his views.

He has released three technical bulletins of crop protection division. Dr. Pathak also visited the Labs and groundnut fields of this Directorate and appreciated the ongoing research work and expected that under the new leadership the institute will attain new heights in groundnut research.



Director DGR welcoming DDG (Animal Sciences)

Dr. N.K. Krishna Kumar, DDG (Horticulture)

Dr. N.K. Krishna Kumar, Deputy Director General (Horticulture), ICAR, New Delhi, visited ICAR-DGR, Junagadh on 09th March, 2015. At the outset, Dr. T. Radhakrishnan, Director, DGR welcomed the DDG to the Directorate and appraised him of various ongoing research and development activities. Dr. Krishna Kumar addressed the staff of the institute and emphasized on the ever increasing needs of edible oil sector of India and role of crops like groundnut and oil-palm in fulfilling those needs. He stressed on the need of organic groundnut cultivation, and ways of reducing the seed-rate substantially for making this crop more profitable. Dr. Kumar released the extension folders on 'Improved and popular groundnut varieties recommended for Gujarat'; published by this Directorate in three languages (Gujarati, Hindi and English). DDG also

visited the labs and interacted with the concerned scientists about the ongoing research programmes, and gave his valuable inputs. He was very glad to see the ongoing research and developmental activities of this Directorate. In his final remarks, he congratulated the staff for doing good work, and motivated them to continue the working spirit under the dynamic leadership of Dr. T. Radhakrishnan.



Dr. N.K. Krishna Kumar, DDG (Horticulture) releasing the extension folders

PERSONNEL

Transfers

- Dr. Poonam Jasrotia, Senior Scientist (Entomology) was transferred to ICAR-DWR, Karnal on 10th April, 2015
- Dr. Anita Mann, Senior Scientist (Plant Physiology) was transferred to ICAR-CSSRI, Karnal on 10th April, 2015
- Dr. K.A. Kalariya, Scientist (Plant Physiology) was transferred to ICAR-DMAPR, Anand on 25th April, 2015
- Dr. Ajay B.C., Scientist (Plant Breeding) was transferred to ICAR-DGR Regional Research Station, Anantapur as a Station Incharge on 15th June, 2015

Promotions

- Eight Scientists of our Directorate viz. Drs. M.C. Dagla, Narendra Kumar, Ajay B.C., Prasanna H., D. Bhaduri, K. Chakarabarty, K.A. Kalariya and K.S. Jadon are promoted to RGP 7000.

New joining

- Dr. K. Gangadhara joined as Scientist (Genetics and Plant Breeding) on 10th April, 2015.



- Mr. Chandramohan Singh joined as Scientist (Agricultural Biotechnology) on 10th April, 2015



Foreign Deputation

- Dr. Ajay B.C. completed Borlaug Fellowship by USDA at Florida A&M University, Tallahassee, Florida, USA from March 7th to June 4th 2015.

Honours and awards

- Mr Sahil Patel, SRF, Biotechnology bagged 'Best Poster Award' In: National Conference on Biodiversity and Bioresource Utilization (17-18 March, 2015) at Department of Biosciences, Saurashtra University, Rajkot
- Mr Tanmoy Sarkar, SRF, Biotechnology bagged 'Best Poster Award' In: UGC Sponsored One Day National Seminar on Recent Advances in Biochemical Research, held at Department of Biochemistry, Saurashtra University, Rajkot, Gujarat on 14th February, 2015.
- Dr. Radhakrishnan T. (Director, ICAR-DGR) is elected as Ex-Officio member of the prestigious Peanut Genome Consortium (PGC) Executive Committee.

**PARTICIPATION IN CONFERENCE/ WORKSHOP/ SEMINAR/ SYMPOSIA/
MEETINGS/ TRAINING PROGRAMMES**

Name	Programme	Venue	Date
Dr. K.A. Kalariya	International training programme on DSSAT "Cropping System Models Application in Land Resource Management"	ICRISAT, Patancheru	23-27 March, 2015
Dr. K. Chakraborty Dr. D. Bhaduri	4 th Bharatiya Vigyan Sammelan and Expo-2015	Kala Academy, Panaji, Goa	5-8 February, 2015
Dr. R.S. Yadav	International conference on natural resource management for food security and rural livelihoods	NASC Complex, New Delhi	10-13 February, 2015
Drs. K.K. Pal and G.P. Mishra	Fourth Annual Review Workshop of NASF	NASC Complex, PUSA, New Delhi	May 28-29, 2015

INSTITUTE SEMINARS

Speaker	Date	Topic
Dr. G.P. Mishra	05 th February, 2015	'Development of novel and stress relevant EST derived SSR markers and its validation in peanut'
Dr. Ajay BC	05 th March, 2015	'P-efficiency in peanut genotypes under native soil P'
Dr. M.K. Mahatma	30 th March, 2015	'Imposition of water deficit stress affects sugar metabolism in source and sink tissues and alters kernel quality in groundnut (<i>Arachis hypogaea</i> L.)'
Dr. K.A. Kalariya	24 th April, 2015	'Manipulation of stomatal behaviour and gaseous exchange capacity through growth retardants and chemicals spray in peanuts under water deficit stress' 'Flowering behaviour and pod yield in groundnut (<i>Arachis hypogaea</i> L.) under protected and rain-fed condition'
Dr. S.K. Bera	24 th April, 2015	'Development of a simple field screening technique for stem rot resistance in groundnut during rabi/summer season'
Dr. Debarati Bhaduri	27 th May, 2015	'Restoration of soil carbon and biological activities of salinity-induced soil by application of groundnut shell biochar' 'Activated peanut husk for atrazine removal from water: Effect of environmental parameters and evaluation of linear and non-linear isotherm modelling'
Dr. Ajay B.C.	15 th June, 2015	Foreign deputation seminar (Norman E Borlaug Fellowship)

Editorial team: Rinku Dey, G.P. Mishra, and Radhakrishnan T. ; **Photo Credit:** A.M. Vakharia

Published by: Director, ICAR-Directorate of Groundnut Research, Junagadh-362001

Website: www.nrcg.res.in; e-mail: director@nrcg.res.in

Tele: +91 0285-2673382; Fax: +91 0285-2672550; EPABX: +91 0285-2673041, 2672461