

**DEPARTMENT OF AGRICULTURAL RESEARCH AND EDUCATION
MONTHLY SUMMARY - JANUARY 2018**

INTERNATIONAL COOPERATION:

- (i) The 4th ASEAN-INDIA Ministerial Meeting on Agriculture and Forestry was held on 12th January, 2018 at NASC Complex, New Delhi. The meeting was preceded by the Preparatory Senior Official meeting on 11th January, 2018. The ASEAN-INDIA Ministerial Meeting was participated by Shri Radha Mohan Singh, Hon'ble Agriculture Minister of India. The Agriculture Ministers and their representatives from the various ASEAN countries participated in the meeting. The meeting aimed to facilitate promotion of joint research for development of technologies for increasing production and productivity of crops, livestock and fisheries and natural resources management, among others, in the region as well as in development of joint ventures, exchange of technologies, expertise and material.
- (ii) A joint meeting of DARE/ICAR with Consultative Group on International Agriculture Research Centre (CGIAR) was held on 30th January, 2018 under the Chairmanship of Secretary, DARE & DG, ICAR at NASC Complex, new Delhi to discuss the ongoing collaborative activities and future programs for enhancing the multilateral cooperation in mutually identified areas with an aim to leverage the strengths of all sides for addressing the common Agricultural Challenges being faced by farmers in different parts of the world with special focus on introduction of methods and techniques in agriculture research and value chain for enhancing the income of Indian farmers. The deliberations during the meeting will further strengthen the ties with CGIAR centers to effectively meet the needs of farmers and other stakeholders.

MAJOR RESEARCH ACHIEVEMENTS

Varietal Improvement:

- (i) Three strains of garden pea were identified (VP907 Early); VP1018 & VP 1208 (Medium)) to release.
- (ii) Four hybrids of radish found promising for yield and earliness and were selected for validation/multiplication.

Agricultural Biotechnology:

- (i) Drought traits linked to QTLs were identified in rabi sorghum that could enhance the yield up to 15%.
- (ii) Two hundred rice landraces collected from eastern UP and Bihar were characterized with 15 HvSSR markers. Genome wide study of publicly available genome data enabled identification of a new source of resistance to nematodes based on Malic enzyme in *Pisum sativum*. The isolated gene has been cloned and used for PCR screening of 30 field cultivars along with field screening of field pea cultivars for nematode reaction. Presence of isolated gene imparting resistance against nematodes was confirmed in 14 cultivars, thus confirming field results.
- (iii) Cloned porcine Elongase 6 (ELOVL6) gene from bone marrow derived mesenchymal stem cell line demonstrated that the gene could be expressed in human cell line (heterologous system), implying the biocompatibility of porcine and human cellular system with regard to the regulation of fatty acid elongation process.

Conservation of Genetic Resources:

- (i) Three thousand eight hundred and sixty three accessions comprising of cereals, millets, grain legumes, oilseeds, vegetables, fruits, potential crops, tubers and *Arabidopsis* were introduced from 23 different countries. The promising accessions introduced were wheat cultivar Wirtas with significant resistance to the most dangerous fungal pathogens combined with high grain quality (high protein content) from Poland (EC930686); French bean core collection from CIAT Columbia (EC931101-EC932597) and Core set of wheat from Australia (EC933715-933915).
- (ii) One thousand one hundred and sixty seven accessions were added to the National Gene bank bringing the genebank holdings to a total of 4, 34,946 (as on 31 December, 2017).
- (iii) Two thousand two hundred twenty seven accessions of regenerated material were added to long-term conservation.

Natural Resource Management:

- (i) Delineated potential area for crops viz. paddy, rubber and spices in Kerala.
- (ii) Intercropping of maize with groundnut with paired row planting method and residue management resulted in higher maize equivalent yield by 32.7 % (7.18 t/ha) and water use efficiency by 32.9% (11.3 kg/ha-mm) as compared to conventional practice of sole maize crop.
- (iii) In irrigated condition toria and sugarcane (1:1 / 2:1), mustard and wheat (1:9), mustard and potato (1:3) and in rainfed condition, mustard and gram (1:5) crop rotation found remunerative.
- (iv) For effective control of *Alternaria* blight disease in oilseeds, seed treatment with *Trichoderma viride* (4 g/kg seed) followed by two sprays of Mancozeb (0.25%) found effective.
- (v) Test kits for rapid detection of formaldehyde and ammonia in fresh fish have been developed. These test kits are based on visual observation of the colour developed. The extent of contamination of formaldehyde and ammonia can be assessed against standard colour chart. The test kits can detect the unsafe levels of formaldehyde between 20-100mg/kg and ammonia more than 300 mg/kg.

Development of Farm Implements, Machinery and Post - Harvest:

- (i) A spraying system of retrofitting urea solution on paddy straw baler was developed.
- (ii) a tractor operated earhead separator for sorghum and pearl millet was developed.
- (iii) Air brake system for agricultural tractor-trailer was developed. The system mainly consists of air compressor, air reservoir, pressure regulator, brake pedal for trailer, dial gauge, connectors, boosters, rotating adjusters, cam system and expanding type leather brakes.
- (iv) An antimicrobial coatings for extending shelf-life of fruits & vegetables was developed.
- (v) Process for extraction and utilization of pectin was developed.
- (vi) process parameters for cryogenic grinding of curry leaves was developed.
- (vii) Protocol for organoleptically acceptable quality kinnow peel candy was developed.
- (viii) Prepared *aonla* based mouth freshener and *anardana*.
- (ix) Coconut milk residue and jackfruit seed enriched biscuits were developed by value addition to the virgin coconut oil production by-product.

Public Outreach:

- (i) Frontline demonstrations on oilseed and pulses were taken up all over the country covering an area of 13841.00 ha and involving 34475 farmers.
- (ii) 348 field-days with the participation of 12686 farmers and 530 *Kisan Goshties/Melas* with the participation of 84177 farmers were organized.
- (iii) Over 3175 training courses for 80410 farmers, 389 trainings for 8838 rural youths and 326 trainings for 7845 extension functionaries and in-service personnel were organized in the frontline areas of technology development.
- (iv) Besides, KVK scientists undertook 7761 visits to the farmers' fields for diagnosing various problems and to sensitize them on location specific recommendations during past one month.
- (v) In *Mera Gaon Mera Gaurav* program 662 scientists visited 622 villages and organized 1048 demonstrations benefitting 42257 farmers. A total of 7700.00 quintals of seed and 17.43 lakh planting materials were also distributed to 6685 and 78175 farmers respectively.
- (vi) 37335 frozen semen doses of Frieswal bulls were produced for insemination of crossbred cattle at Military Farms and farmers' herd.
- (vii) During the month, vaccinations with 30200 doses of *Ranikhet Disease (RD)*, 2800 doses of *Infectious Bursal Disease (IBD)*, 10400 doses of *Marek's disease* and 1700 doses of fowl pox were carried out in broiler, layer, turkey, guinea/*desi* fowl/emu.
- (viii) In NADRES (National Animal Disease Referral Expert System), disease prediction was automated and the probability of disease outbreak was categorized in 6 risk levels.
- (ix) National Collection of Dairy Cultures (NCDC) supplied 52 nos. freeze dried cultures to 7 cooperative dairy and milk plants in private sector for fermented milks and cheese; and microbial strains to 4 educational institutes for teaching and research purposes.

Application of Space Technology:

- (i) One Indian Regional Navigation Satellite System (IRNSS) through ISRO as a part of Ministry of Earth Science project entitled "To explore the potential application of Infrasonic supported by Ionosonde, GPS and Sodar for Earthquake Precursor Studies" is regularly being used for data collection. Weekly data files till 02.01.2018 have been sent to NPL Delhi.
- (ii) Automatic Weather Station (AWS) installed at ICAR-VPKAS, Almora through department of space ISRO and Indian Institute of Remote Sensing (IIRS), Dehradun is being regularly used for weather data collection (average Temperature, maximum and minimum temperature, RH, wind speed, wind direction, solar radiation, rainfall, dew point) as well as transmission to IIRS.
- (iii) A unique satellite data reception center has been established in the Division of Agricultural Physics at IARI. These data are being used for monitoring crop health and drought condition in all the districts of the country. This information is regularly updated on the web portal <http://creams.iari.res.in>, which is available to all stakeholders for decision making.
- (iv) The web page on 'Network of GMO Testing Laboratories (NGTL) of India' (<http://gmolabs.nbpgr.ernet.in:9090/>), with dynamic information about 18 GMO detection laboratories, has been developed. This would facilitate harmonizing of the GMO/LMO detection activities in the country.

- (v) Agro-met advisory bulletins are being prepared on every Tuesday and Friday based on the past weather data, current weather data and weather forecast received for next five days on different weather parameters viz. maximum and minimum temperature, rainfall, cloud cover, wind speed and wind direction from Regional Meteorological Centre, India Meteorological Department, Agromet Advisory Unit, Safdarjung, New Delhi in Hindi as well as in English. During October 20 - November 19, 2017, total 8 agro-advisory bulletins were prepared in Hindi as well as in English and SMS were sent to the farmers through farmers Kisan portal. These advisories are sent to IMD for preparation of National bulletins and uploaded on the IMD website (www.imdagrimet.gov.in) in both Hindi and English. These advisories and real time weather data along with medium range weather forecast was uploaded on the IARI website (www.iari.res.in).

OTHER MAJOR ACTIVITIES:

- (i) Union Minister of Agriculture and Farmer Welfare Shri Radha Mohan Singh addressed a gathering at the North-East Regional Agriculture Fair 2018 organised by the ICAR Research Complex for North Eastern Hill (NEH) Region, Umiam, Meghalaya. He said ICAR Research Complex for NEH Region, Umiam, since its inception has done many basic, strategic and applied research specific to the farming problems of the NEH Region. The Minister appreciated ICAR, NEH Region, Umiam, for launching the programme to double the income of the farmers on a pilot basis in the villages adopted by them in the next 5 years. The Minister said that through the adoption of improved technologies, the productivity and farmers' income can be increased. The superior quality horticultural crops such as orange, pineapple, flowers, etc. can be produced in the region and the surplus can be marketed with the effective supply chain management, a key area that needs intervention. The farmers can increase their income by adopting technologies like crop rotation, integrated farming, organic farming, double/triple cropping system by the farmers instead of relying on traditional farming
- (ii) Big size permanent hoarding on Soil Health Card scheme were installed at prominently visible public places, ICAR institutes and KVKs.