

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

**INTERNATIONAL COOPERATION:**

- (i) MoU Signed between ICAR and Western Sydney, Australia on 28<sup>th</sup> November, 2018 at New Delhi. The MoU would facilitate the two countries to collaborate in cutting-edge research to bridge the gaps between potential and realized yield, mitigate the effect of climate change on agriculture, employ artificial intelligence, strengthen pollinator research and enable academic exchange between the two countries.
- (ii) Dr. Trilochan Mohapatra, Secretary, DARE & DG, ICAR participated in the pre-discussion meeting of International Livestock Research Institute (ILRI) on 12.11.2018 and its Regional meeting “Transforming livelihoods in South Asia through sustainable livestock research and development” during 13-14 November, 2018 held at Kathmandu, Nepal.
- (iii) Dr. Trilochan Mohapatra, Secretary, DARE & DG, ICAR participated in the 52<sup>nd</sup> Annual Board of Trustees (BoT) meeting of Bioversity International during 25-28 November, 2018 held at Washington DC, USA.
- (iv) Shri Chhabilendra Roul, SS (D) & Secretary, ICAR has participated in the 7<sup>th</sup> CGIAR System Council meeting during 12-16 November, 2018 held at Seattle, USA.
- (v) ICAR-Central Institute of Fisheries Technology (CIFT) organized an international training programme on “Extension Management Techniques for Up-scaling Technology Dissemination in Fisheries” from 9-22 November, 2018. Twenty senior government officials from fourteen developing countries namely Algeria, Guatemala, Mauritius, Oman, Sri Lanka, Sudan, Syria, Tanzania, Tunisia, Uganda, Zimbabwe, Malawi, Afghanistan and Bangladesh spread over Asia, Africa and North America attended the programme.
- (vi) Organized FAO SEALNET 2.0 (South-East Laboratory Network) Lab Managers' Meet at IISS, Bhopal during 19-23 Nov 2018 to (i) calibrate and harmonize soil testing procedures and practices in laboratories in the ASEAN and wider Asian regions in the context of the Asian Soil Partnership (ASP), (ii) set up a regional inter-laboratory proficiency program to implement QA/QC (quality assurance/quality control) procedures and processes, and (iii) provide training and capacity building for lab staff.

**MAJOR RESEARCH ACHIEVEMENTS**

**Varietal Improvement:**

- (i) Three maize hybrids viz. DMRH 1305 (field corn) and IMHB1539 & IMHB1532 (baby corn) were developed and released for cultivation.

**Agricultural Biotechnology:**

- (i) The glasshouse potato aphid *Aulacorthum solani* (also known as foxglove aphid) is a sucking pest of potato and a vector of important potato viruses causing potato virus Y (PVY) and potato leaf roll virus (PLRV) diseases and a serious threat to potato crop. Whole genome sequence of *A. solani* collected from potato plant was developed

using Illumina sequencing technique. This would provide key information to understand aphid biology, evolutionary process, aphid-plant interactions and new management strategies to control the aphid.

- (ii) Molecular characterization of recombinant Newcastle disease virus (rNDV) strain R2B with avirulent fusion protein cleavage site revealed that the virus was stable for 10 passages in Vero cells with intact avirulent cleavage site as determined by sequencing.
- (iii) Biological characterization of (rNDV) revealed a mean death time and intracerebral pathogenicity index of > 168 hrs and 0.0 indicating the loss of virulence of the virus as compared to the original virus.

#### **Conservation of Genetic Resources:**

- (i) About three thousand fourteen accessions comprising of cereals, vegetables, tubers and medicinal crops were introduced from 10 different countries. The important accessions introduced were large white Cuzco Corn kernels (EC967289-967291) from CIMMYT, Mexico; Potato lines resistant and susceptible to Poty virus Y (EC965736-965722) from CIP, Peru; High Zn content rice lines (EC963570-966583) from IRRI, Philippines.
- (ii) Eighty four accessions were added to the National Genebank bringing the **Ex-situ** genebank holdings to a total of 4,38,922 (as on 31<sup>st</sup> October 2018). Additionally, regenerated material (283 accessions) was added to long-term conservation.

#### **Natural Resource Management:**

- (i) Developed organic farming package of practice for turmeric-onion system with B: C ratio of 2.52 at Ludhiana (Punjab).
- (ii) At Parbhani, Maharashtra, in deep black clayey soil, drip irrigation through inline laterals and drip fertigation saved 20% irrigation water and 25% fertilizer and gave 11% higher yield of hybrid maize crop of 8.58t/ha compared to conventional irrigation and fertilizer application.
- (iii) In kharif potato at Shimla, significantly higher (23%) yield of Kufri Jyoti was obtained under drip irrigation as compared to control.
- (iv) Antibacterial sensitivity of methanolic extract of Kuyavu (the medicinal plant of tribal farming community) was found effective against Salmonella of ducks.
- (v) Neem oil (0.5%) was found most effective against *Singhara* beetle, *Galerucella burmanica* infesting water chestnut.
- (vi) The dwarf honeybee is more efficient than Asian honeybee in pollinating buckwheat and the crop requires 1.47 and 1.73 visits of dwarf honeybee and Asian honeybee, respectively for optimum seed set.

#### **Development of Farm Implements, Machinery and Post - Harvest:**

- (i) Developed animal drawn weeder-cum-fertilizer applicator for topdressing of granular urea in widely spaced crops and tested for cotton crop planted at spacing of 90×60 cm.
- (ii) Developed tractor mounted wheat straw collector.
- (iii) Developed Onion De-scaler to reduce drudgery and clean the onions effectively.

- (iv) Developed mechanized system for jamun fruit bar manufacturing.
- (v) Developed antimicrobial coatings for extending shelf-life of mango.
- (vi) Developed prayer mat from jute and yak fibre blend fibre.
- (vii) Developed green gram flakes using sprouting technique.
- (viii) Developed process protocol for extraction of protein concentrates from cottonseed meal.
- (ix) In order to make uniform web of wool fibre for laying inside the cotton fabric, a web forming system consisting of metal cylinder coated with felt is designed, developed and fitted with worsted card to produce uniform and bulk production of Razai. This new mechanical device is able to produce wool web with equal spatial distribution of fibre.

#### **Public Outreach:**

- (i) Frontline demonstrations on oilseed and pulses were taken up all over the country covering an area of 12107.50 ha and involving 32164 farmers.
- (ii) 490 field-days with the participation of 18316 farmers and 624 *Kisan Goshties/Melas* with the participation of 162489 farmers were organized.
- (iii) A total 3990 training courses for 102703 farmers, 978 trainings for 15036 rural youths and 424 trainings for 8394 extension functionaries and in-service personnel were organized in the frontline areas of technology development.
- (iv) Besides, KVK scientists undertook 8200 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 741 scientists visited 784 villages and organized 1296 demonstrations benefitting 56147 farmers. A total of 6423.83 quintals of seed and 17.83 lakh planting materials were also distributed to 8353 and 41943 farmers respectively.
- (vi) Milkfish, *Chanos chanos* was successfully farmed in a brackishwater pen culture system in Pulicat lake, Tamil Nadu with a Benefit Cost Ratio of 1.25.
- (vii) About 4 lakh seeds of indigenous fish species was released in the river Ganga to revive the indigenous germplasm at Nabadwip and Barrackpore.

#### **Application of Space Technology:**

- (i) 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.
- (ii) One Indian Regional Navigation Satellite System (IRNSS) through ISRO as a part of Ministry of Earth Science project is regularly being used for data collection by VPKAS, Almora and the weekly data files till 16.11.2018 have been sent to NPL Delhi.
- (iii) A satellite data reception centre has been established in the Division of Agricultural Physics, IARI, New Delhi. These data are being used for monitoring crop health and drought condition in all the districts of the country. This information is regularly updated in the webportal <http://creams.iari.res.in>, which is available to all stakeholders for their own decision making.

- (iv) Agro-met advisory bulletins are being prepared on every Tuesday and Friday under *Gramin Krishi Mausam Sewa* 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.

**OTHER MAJOR ACTIVITIES:**

- (i) Shri Radha Mohan Singh, Hon'ble Union Minister of Agriculture and Farmers' Welfare visited ICAR- Central Inland Fisheries Research Institute (CIFRI), Barrackpore on November 16, 2018 and inaugurated 8 days skill development sensitization programme on "Inland Fisheries Management for livelihood improvement" for 400 volunteers of Nehru Yuva Kendra, West Bengal.
- (ii) Porcine Reproductive and Respiratory Syndrome (PRRS) is an economically important viral disease of pigs. In India, PRRS outbreaks have been occurring in the Northeast India, resulted in death of thousands of pigs, causing huge economic loss to the farmers. We have developed and validated a cost effective ELISA kit employing antigens suitable for Indian conditions and capable of detecting a wide range of PRRS strains for large scale sero-surveillance. This ELISA kit will help in cost effective surveillance and monitoring of PRRS in the country, and will aid in the PRRS control programme
- (iii) Sheep Database Management Portal ([www.sheepdbms.org.in](http://www.sheepdbms.org.in)) was launched by Hon'ble Shri. Radha Mohan Singh ji. The Sheep Database Management System (DBMS) is an online database repository system designed to collect data from different centres working on sheep breeding and management at different places all over the India.
- (iv) Developed *CIFTFISHPRO*- a web based information system on CIFT value added fish products and released the same on November 22, 2018 by Shri. K. S. Srinivas, IAS, Chairman, MPEDA, Ministry of Commerce and Industry, Govt. of India. One interactive feature of *CIFTFISHPRO* is to help the user in calculating the ingredients requirement for a given quantity of raw fish. This information system has got copyright registration from copyright office, Govt. of India and it is available in the url <http://ciftfishpro.cift.res.in/>.