

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

INTERNATIONAL COOPERATION:

- (i) Under Indo-UK-DBT international collaborative research project, 'Poverty alleviation through prevention and future control of the two major socioeconomically important diseases in Asian aquaculture', ICAR-CIBA organized an interaction meet at Chennai on March 19, 2018. Principal Investigators of the project from ICAR-CIBA, UK and Bangladesh participated.
- (ii) Work Plan (2018-20) between Indian Council Agricultural Research (ICAR) and Ministry of Agriculture and Rural Development (MARD), Govt. of Socialist Republic of Vietnam was signed on 3rd March, 2018.
- (iii) Collaborative Work Plan between Indian Council Agricultural Research (ICAR) and International Potato Centre (CIP) for the period 2018-22 was signed on 20th March, 2018.

MAJOR RESEARCH ACHIEVEMENTS

Varietal Improvement:

- (i) Three varieties of garden pea viz; *Vivek Matar* 13 (VP 907), *Vivek Matar* 14 (VP 1018) & *Vivek Matar* 15 (VP 1208) were released for Uttarakhand.
- (ii) Four superior lines of velvet bean (*Mucuna pruriens*) viz., IIHR PS-2, IIHR PS-6, IIHR Sel-3, IIHR Sel-8 were identified for release.
- (iii) A new variety of cashew H-130 having bold nut, bearing high yield was released for evaluation in farmers' field.

Agricultural Biotechnology:

- (i) Rice genotypes, Moroberekan (MB), Pusa Basmati 1 (PB) and cultivar 996 (C996), and microarray data generated on Nagina 22 (N22) and IR64, the raw data files were extracted to subject them to meta-analysis. Among these, N22 and C996 were found to be heat tolerant genotypes, while MB, IR64 and PB are heat sensitive. The heat responsive genes were identified. The number of heat responsive genes identified were 3127 (C996), 2905 (N22), 1162 (IR64), 1679 (MB) and 2653 (PB).
- (ii) Association of detoxification genes (Glutathione peroxidase and Ascorbate peroxidase) expression towards the differential drought tolerance nature of tolerant (Acc. 4226) and susceptible (Acc. 5641) genotypes of black pepper was elucidated.
- (iii) Developed hybridomas against FMD virus Non-structural protein 3 AB produced and characterized.
- (iv) Evaluated therapeutic efficacy of curcumin against arsenicosis by whole liver transcriptome analysis of *Labeo rohita* exposed to arsenic. Identified diagnostic biomarker(s) of arsenicosis. The transcript information has been archived at Sequence Read Archive (SRA) Database, NCBI (SRA Submission ID SRR6365041).

Conservation of Genetic Resources:

- (i) One thousand two hundred and twenty six accessions comprising of cereals, grain legumes, vegetables and tubers were introduced from seven different countries. The promising accessions introduced were high yielding safflower accessions that are

salinity tolerant and resistant to *Phytophthora rot*, from USA (EC938657-938712). Also eight accessions of winged bean were acquired from the USA.

- (ii) One hundred and twenty six accessions were added to the National Genebank bringing the genebank holdings to a total of 4, 35, 264 (as on 28 February, 2018).
- (iii) Nine hundred ninety four accessions of regenerated material were added to long-term conservation.

Natural Resource Management:

- (i) In clay loam soils, drip fertigation including liquid biofertilizer in tomato resulted in fruit yield of 37.5 t/ha which is 13 % higher than the normal drip irrigated and 24% higher than surface irrigated tomato crop. The practice saved 40% irrigation water and 35% of recommended nitrogen fertilizer compared to conventional surface irrigation system.
- (ii) An organic farming package of practice for scented rice (*khariif*)-chickpea (*rabi*)-maize (fodder) (summer) with B: C ratio of 1.79 developed at Jabalpur (Madhya Pradesh).
- (iii) Solar drying at 68 and 62^oC (noon temp.) for five days reduced the hatching of eggs of pulse beetle, *Callosobruchus chinensis* by 79.18 and 81.25, in 68 and 62^oC temperatures, respectively.

Development of Farm Implements, Machinery and Post - Harvest:

- (i) Tractor operated single row cassava stake cutter planter developed.
- (ii) Solar dryer for ginger drying developed.
- (iii) Spike cylinder single locking cotton feeder developed.
- (iv) Protein rich soy based fortified compressed food bars developed.
- (v) Process standerized for pectin extraction from citrus peel.
- (vi) Developed antimicrobial coatings for extending shelf-life of guava.
- (vii) A vibration based grading machine was developed for the grading (3 grades) and counting of minitubers. It consists of hopper electromagnetic vibrator & conveyor with variable opening.

Public Outreach:

- (i) Frontline demonstrations on oilseed and pulses were taken up all over the country covering an area of 13344.12 ha and involving 32331 farmers.
- (ii) 655 field-days with the participation of 27280 farmers and 596 *Kisan Goshties/Melas* with the participation of 116349 farmers were organized.
- (iii) Over 3539 training courses for 83508 farmers, 505 trainings for 10932 rural youths and 357 trainings for 8946 extension functionaries and in-service personnel were organized in the frontline areas of technology development.
- (iv) Besides, KVK scientists undertook 6969 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 643 scientists visited 610 villages and organized 767103 demonstrations benefitting 39876 farmers. A total of 7638.37 quintals of seed and 20.85 lakh planting materials were also distributed to 4711 and 58335 farmers respectively.
- (vi) 28300 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 31200 doses of *Ranikhet* Disease (RD), 2800 doses of Infectious Bursal Disease (IBD), 25300 doses of *Marek's disease* and 1900 doses of fowl pox were carried out in broiler, layer, turkey, guinea/*desi* fowl/emu.
- (viii) Test kit 'CIFLIN' for detection of formaldehyde adulteration in fish has been developed and field tested under Food Safety and Standards Authority of India (FSSAI) funded project.
- (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 7 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 12.03.2018 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) Pan India Vegetation Dynamics Monitoring through remote sensing- Time series 16 days maximum value composite of Enhanced Vegetation Index (EVI), of 250 m resolution derived from the Moderate Resolution Imaging Spectroradiometer (MODIS) data for the period 2000 to 2015 was analyzed to understand the spatial and temporal dynamics of vegetation. The higher percentage of annual variability upto 30 % and more is seen in the Himalayan plain such as J&K, Himanchal Pradesh and Uttarakhand region where as Indo-Gangetic plains and other region of India has the average annual variability from 05 to 20%. Seasonal mean variability indicates more variability in rabi season compared to kharif.
- (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 February 20, 2018 - March 19, 2018, 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.

OTHER MAJOR ACTIVITIES:

- (i) Union Minister of Agriculture and Farmer Welfare, Shri Radha Mohan Singh released the Education portal of ICAR at the Conference of Vice Chancellors of Agriculture Universities and Directors of ICAR Institutes in New Delhi on 8th March, 2018. Education Portal-ICAR (<https://education.icar.gov.in>) will act as a single window platform for providing vital education information/ announcements/ event schedules/ e-learningresources from Agricultural Universities across the countryto the rural youth in an easy and fast way on their doorsteps. The portal has been developed as an ICAR initiative under the Digital India programme of the Prime Minister of India and for the first time all the Agriculture universities have come on the single platform to disseminate the information for benefits of students and farming community.
- (ii) The Union Minister of Agriculture and Farmers Welfare Shri Radha Mohan Singh addressed three-day Annual Krishi Unnati Mela on March 16, 2018 at Mela ground, IARI, Pusa, New Delhi. The Krishi Vigyan Mela (Agriculture Science Fair) was initiated in 1972 and continues to be a highly important annual event of the Indian Council of Agricultural Research (ICAR). Hon'ble Prime Minister Shri Narendra Modi, on March 17, 2018 addressed the farmers, agricultural scientists and other participants during the mela. Shri Narendra Modi inaugurated the Jaivik Kheti portal and layed the foundation stone of 25 KVKs. He will also confer the Krishi Karman Award & Pandit Deen Dayal Upadhyay Krishi Vigyan Protsahan Puraskar.
- (iii) The Hon'ble Parliamentary Secretary for Food and Civil Supply, Shri Tage Taki, inaugurated Coldwater Fish Hatchery installed by ICAR-DCFR at Hari village, Ziro valley of Lower Subansiri district, Arunachal Pradesh on March 22, 2018.