

**DEPARTMENT OF AGRICULTURAL RESEARCH AND EDUCATION  
MONTHLY SUMMARY - MARCH 2019**

**INTERNATIONAL COOPERATION:**

- (i) Work Plan for the years 2019-23 between Indian Council of Agricultural Research and Western Sydney University under the Memorandum of Understanding on Cooperation the field of Agricultural Research and Education was signed on 26/03/2019.
- (ii) Mr. Victor Canhamba, Permanent Secretary, Ministry of Agriculture and Food Security, Mozambique visited IARI, New Delhi for extending cooperation with Mozambique in Agriculture research and education on 16.3.2019.

**MAJOR RESEARCH ACHIEVEMENTS**

**Varietal Improvement:**

- (i) Six wheat varieties viz. PBW 752, PBW 757, HD 3237, HD 3226, HI 1620 and DBW 187 were released and notified for cultivation.
- (ii) Maize varieties viz. VL Maize Hybrid 57 and VL Soya 89 have been released and notified for cultivation.
- (iii) VL Gehun 967, VL Gehun 3004, VL Gehun 2014 of wheat, VLB 130 of barley and VL Mandua 380 of finger millet were released and notified for cultivation in Uttarakhand
- (iv) One very high yielding New Generation Rice (NGR) genotype i.e., CR 3856-44-22-2-1-11 has been developed. In the trials conducted in farmers' field in Odisha, it gave 36.49% higher yield.
- (v) Validation of ty-2 and ty-3 gene in tomato backcross population in cultivar *Kashi Vishesh* for tomato leaf curl virus resistance was done.
- (vi) Gladiolus early variety Arka Pratham, blooms in 61 days and produces 1.85 spikes / corm (2.1 lakhs per ha). It also produces 1.82 corms per plant and 52.56 cormels per corm. The floret colour is Violet with White lines. Also developed Arka Ranjini which blooms in 65 days and produces 2 spikes/corm ( 2.4 lakhs per ha). The florets are in double rows and floret colour is purple with white blotch.
- (vii) Rose variety Arka Kinnari is an ever blooming floriferous Hybrid T rose identified for garden display. It produces bicolor flower consisting vermilion red shading towards orient pink. Another variety Arka Sharmeeli is an ever blooming floriferous Hybrid T rose identified for garden display. Flower color changes from light pink to different shades of red from bud to different stages of blooming.

**Agricultural Biotechnology:**

- (i) Fifty Basmati genotypes were screened by 6 different primers linked to BADH2 locus, responsible for aroma.
- (ii) Four hundred BC<sub>2</sub>F<sub>1</sub> plants of rice in the background of PS5 were screened by two markers viz. DRRMRf3-5 and RM 6100 for two fertility restorer genes *Rf3* and *Rf4*, respectively.
- (iii) The method for maximum enrichment of spermatogonial stem cells (SSCs) and culture condition for sustaining its proliferation and stemness *in vitro* have been developed. The developed culture system supports SSCs proliferation and stemness for 36 days (4 passages).

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

- (i) In germplasm conservation (*Ex-situ*), Four hundred and eighty seven accessions were added to the National Genebank bringing the Genebank holdings to a total of 440419.
- (ii) A total of 36 mango accessions have been established in the field gene bank.
- (iii) One thousand three hundred and fifty accessions (1350) including cereals were introduced from 11 different countries. The important accessions introduced were Japanese wheat landrace Nobeoka Bozu which is moderately resistant to Fusarium head blight (EC976846) from Japan.

### **Natural Resource Management:**

- (i) Developed organic farming package of practice of Scented rice – berseem (fodder & seed) system with B: C ratio of 2.04 at Jabalpur (Madhya Pradesh).
- (ii) At Coimbatore, cotton and blackgram (intercrop) grown under drip fertigation in red loamy soil resulted in cotton equivalent yield of 3.86 t/ha with 45.7% higher yield, 59.0% higher water use efficiency (WUE) and 56.8% higher net income compared to conventional surface irrigation and fertiliser application.
- (iii) The integrated virus disease management in cucumber indicated that border cropping with two rows of maize, reflective agri mulching, installation of blue and sticky traps, soil application of Arka microbial consortium (AMC) @ 20g/lit to cucumber seedlings rhizosphere, spraying of vegetable special @ 3g/lit, Fipronil @ 1.0ml/lit, Thiamethoxam @ 0.5g/lit and neem oil 3ml/lit at weekly intervals till the 50% flowering was effective in the management of viral diseases of cucumber plants. There is 70% reduction in the incidence of viral diseases with significant two fold increase in yield.
- (iv) Through grafting technology tomatoes were produced successfully. From single tomato plant, 1.5 kg of tomato and 0.5-0.6 kg of potato were harvested.
- (v) Maximum yield in cauliflower and cabbage were obtained under drip irrigation at 0.4 bars coupled with black silver mulch application.

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

- (i) Developed tractor operated cotton stalk shredder-mixer.
- (ii) Developed abrasive pre-treatment machine for grape berries.
- (iii) Developed vertical farming structure (multi-tier hydroponic system) for vertical space utilization inside polyhouse.
- (iv) Developed annular core biochar reactor to produce designer char.
- (v) Developed fruit waste and plant extracts in developing antimicrobial coatings for extending shelf-life of guava.
- (vi) Solar based cold storage for fruits and vegetables for up to 2000 kg storage capacity to lower the wastage of perishable agricultural products has been developed.
- (vii) Developed black carrot fortified functional breads with the extraction of natural color from black carrot.
- (viii) Developed sprouted green gram based flakes.

- (ix) The comber noil waste was added in blankets at varied ratios from 10 to 40% along with Bharat Merino and Chokla wool to improve the smoothness and thermal resistance. By addition of waste smoothness of blanket was improved. Similarly thermal resistance also enhanced by 12%.

#### **Public Outreach:**

- (i) Frontline demonstrations on oilseed and pulses were taken up all over the country covering an area of 10597.72 ha and involving 28954 farmers.
- (ii) 482 field-days with the participation of 17324 farmers and 607 *Kisan Goshties/Melas* with the participation of 110846 farmers were organized.
- (iii) A total 2879 training courses for 61027 farmers, 1161 trainings for 8269 rural youths and 571 trainings for 6840 extension functionaries and in-service personnel were organized in the frontline areas of technology development.
- (iv) In *Mera Gaon Mera Gaurav* program, 689 scientists visited 709 villages and organized 847 demonstrations benefitting 43306 farmers. A total of 3066.45 quintals of seed and 14.20 lakh planting materials were also distributed to 6364 and 47360 farmers respectively.

#### **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 15.03.2019 have been sent to NPL Delhi.
- (iii) A unique 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.

#### **OTHER MAJOR ACTIVITIES:**

- (i) ICAR- Central Institute of Fish Technology (CIFT), Kochi is conferred with “National Reference Laboratory (NRL) status for Fish and Fish Products” by Food Safety and Standards Authority of India (FSSAI), Ministry of Health and Family Welfare, Govt. of India under Regulation 3 of Food Safety and Standards (Recognition and Notification of Laboratories) Regulation, 2018 on March 19, 2019 vide Order No. 12013/02/2017-QA.
- (ii) ICAR institute CIFT, Kochi under ‘Blue Revolution Scheme’ designed 22.50m Long liner cum Gillnetter for Department of Fisheries Tamil Nadu which are being constructed by M/s Cochin Shipyard Limited (CSL). A total of 16 vessels are under construction. First four vessels were flagged off on February 19, 2019 by the Hon’ble Chief Minister of Tamil Nadu, four vessels are handed over to fishers in March 2019 and construction of remaining vessels is nearing completion.