

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

INTERNATIONAL COOPERATION:

- (i) A joint meeting of DARE/ICAR with Consultative Group on International Agriculture Research Centre (CGIAR) was held on 24th and 25th January, 2019 under the Chairmanship of Secretary, DARE & DG, ICAR 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.
- (ii) Collaborative Work Plan between ICAR and International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) for the period 2019-23 was signed on 24th January, 2019.

MAJOR RESEARCH ACHIEVEMENTS

Varietal Improvement:

- (i) Two varieties of garden pea namely VL *Sabji Matar* 13 (early maturity) and VL *Sabji Matar* 15 (Medium maturity) were released and notified for cultivation.
- (ii) Bhima Shakti onion variety recommended for cultivation.
- (iii) Three banana varieties namely *Kaaviri Saba*, *Kaaviri Kalki* and *Kaaviri Sugantham* have been released for cultivation.
- (iv) Boro rice genotype TP30752 (IRTON 103) which highly cold tolerant at seedling stage has identified.

Agricultural Biotechnology:

- (i) To identify polymorphism in paddy, out of six SSR markers (RM-228, RM-05, RM-136, RM-316, RM-132 and RM-05) only two (RM-228 and RM-05) are able to differentiate the 12 paddy varieties cultivated in eastern U.P. region.
- (ii) Two *Vasconcellea*-leaf type mutants in Arka Prabhat were obtained in M2 population. These mutants were both selfed and sib-mated for advancing the generation and can be a promising pre-breeding material towards Papaya ringspot virus (PRSV) resistance in papaya.
- (iii) RNAi silencing of Bacterial wilt susceptible gene imparts activation of defense pathway against *Ralstonia solanacearum*.
- (iv) A new gill fluke species, *Dactylogyrus scorpius* (*Dactylogyrus* lineage III) associated with rohu gill infection based on 28s rDNA sequencing was identified first time in India.

Conservation of Genetic Resources:

- (i) Germplasm conservation (*Ex-situ*) of four hundred and forty two accessions were added to the National Genebank bringing the Genebank holdings to a total of 439717.

- (ii) Three thousand six hundred and seventy nine accessions comprising of Cereals, Grain legumes, Oilseeds Vegetables, Fruits, Tubers, Spices were introduced from 14 different countries. The important accessions introduced were Apple accessions resistant to fire blight and phytophthora, excellent anchorage, drought tolerant, resistant to collar rot and woolly aphid (EC971990-971991) from USA.
- (iii) Forty-six specimens were added to the National Herbarium of Cultivated Plants bringing the holdings to a total of 23,665 specimens (as on December 31, 2018).
- (iv) Four isolated avian adeno viruses in chicken embryo liver culture were preserved in the NCVTC repository.
- (v) First time the old woman octopus, *Cistopus indicus* (Rapp, 1835) caught in bag net from the estuarine zone of Narmada river at Bhadbhut region (21°40'52"N, 72°50'42"E). Total 17 specimens with total length ranging from 190-320 mm were measured and reported.

Natural Resource Management:

- (i) Developed organic farming package of practice for maize - berseem - bajra (fodder) system with B: C ratio of 2.52 at Ludhiana, Punjab.
- (ii) Raised bed crop stand ensured higher water productivity both in maize and wheat (0.88- 0.89 g/lit), closely followed by zero tillage (0.82-0.85 g/lit) accounting around 40-50 % enhancement over conventional tilled crops.
- (iii) Three new biocontrol technologies were released for commercialization Viz. Lecanicillin-G, a technology for control cardamom thrips using the entomopathogenic fungus *Lecanicillium psalliotae*; Pochonin-L, a liquid formulation of *Pochonia chlamydosporia* for control of plant parasitic nematodes; and Bacillich, an ecofriendly technology for managing bacterial wilt in ginger by using an apoplastic bacterium, *Bacillus licheniformis*.

Development of Farm Implements, Machinery and Post - Harvest:

- (i) Developed mini tractor mounted boom sprayer.
- (ii) Developed weeding attachment for high clearance vehicle.
- (iii) Developed fish dressing platform for women workers.
- (iv) Developed tractor operated auger plough for green manuring and straw incorporation.
- (v) Fumigation chamber design was developed for treatment of grapes with SO₂ and CO₂ and standardization of treatment protocol for export of grapes.
- (vi) Developed mobile cool chamber for transportation of fruits and vegetables.
- (vii) Developed onion cold storage for rural areas.
- (viii) Process for extraction of natural color from black carrot has been standardized.
- (ix) Developed banana fibre based kraft pulping for packaging.

Public Outreach:

- (i) Frontline demonstrations on oilseed and pulses were taken up all over the country covering an area of 13368.57 ha and involving 35941 farmers.
- (ii) 394 field-days with the participation of 13109 farmers and 671 *Kisan Goshties/Melas* with the participation of 113873 farmers were organized.

- (iii) A total 3567 training courses for 99421 farmers, 1193 trainings for 7792 rural youths and 447 trainings for 7629 extension functionaries and in-service personnel were organized in the frontline areas of technology development.
- (iv) In *Mera Gaon Mera Gaurav* program 887 scientists visited 709 villages and organized 1300 demonstrations benefitting 53131 farmers. A total of 7484.58 quintals of seed and 11.42 lakh planting materials were also distributed to 6937 and 52731 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 17.01.2019 have been sent to NPL Delhi.
- (iii) Geostatistical modelling was applied for spatial prediction of fish species richness of Lohit, Ranga, Kurung and Dibang rivers in Arunachal Pradesh, India. The predicted maps generated would be useful for developing location specific conservation strategies.
- (iv) ICAR-CIFT installed a wave rider buoy at Veraval, in collaboration with NIO and INCOIS to transmit real time data of sea wave height to INCOIS base station. This will help immensely in dissemination of sea state forecast along the northwest coast of India.

OTHER MAJOR ACTIVITIES:

- (i) The Indian Council of Agricultural Research (ICAR) was awarded First Prize for its Tableau, 'Kisan Gandhi' in the Republic Day Parade - 2019. Smt. Nirmala Sitharaman, Minister of Defence, handed over the award to the ICAR team. The ICAR tableau displayed the importance of dairy farming, use of indigenous breeds and livestock based organic agriculture for rural prosperity. The ICAR tableau 'Kisan Gandhi' portrayed the Gandhiji's vision to improve agriculture and livestock for the prosperity of rural communities. To gain more insight, he attended a training program on dairy farming for fifteen days in 1927 at Bangalore Centre of the ICAR - National Dairy Research Institute. He also visited and appreciated the 'Indore method' of composting at the Institute of Plant Industry, Indore in 1935. The Gandhian philosophy included promotion of Swadeshi breeds, organic agriculture and goat milk for better health. In order to realize Gandhi's dream, the Indian Council of Agricultural Research is relentlessly working towards transforming the Indian Agriculture for ensuring livelihood security and higher income of our *Annadata*, the farmers. By developing and deploying cutting edge science and technology, India has succeeded in achieving food self-sufficiency and remains the highest milk and cotton producer in the world.