

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

INTERNATIONAL COOPERATION:

- (i) A Memorandum of Understanding between Indian Council of Agricultural Research (ICAR) and Tajik Academy of Agricultural Sciences (TAAS), Tajikistan in the field of agricultural research and education has been signed on 8th October, 2018. The scope of MoU includes exchange of scientists and technologists, germplasm, scientific literatures and other mutually agreed items related to agricultural research and education.

MAJOR RESEARCH ACHIEVEMENTS

Varietal Improvement:

- (i) Bold seeded lentil variety-LL 1373, resistant to rust and wilt, has been identified for release for cultivation in Western Uttar Pradesh, Northern Rajasthan, Punjab, Haryana, Uttarakhand and states of North West Plain Zone (NWPZ) of the country.
- (ii) Chickpea variety GNG 2299 has been identified for cultivation under late sown condition in North Eastern Plain Zone comprising of Eastern Uttar Pradesh, Bihar, Jharkhand, West Bengal, Assam and Manipur. Other chickpea variety H 12-55 has also been identified for late sown condition in North West Plain Zone comprising of Punjab, Haryana, Western Uttar Pradesh, Delhi, North Rajasthan, Jammu and Kashmir, Plains of Himachal Pradesh and Uttarakhand.
- (iii) Pigeonpea variety CRG 2012-25 has been identified for release for cultivation in South Zone comprising of Tamil Nadu, Karnataka, Andhra Pradesh, Telangana and Odisha.
- (iv) A barley strain VLB 141 developed and identified for release with an average yield of 18.50 q/ha under timely sown rainfed organic conditions of Uttarakhand hills.

Agricultural Biotechnology:

- (i) The web portal database "Indian Wild Rice Database" (IWRD) of wild rice was developed. The website address is 'nksingh.nationalprof.in:8080/iwrdb'. This database IWRD contains 614 accessions of wild rice germplasm. Total 46 morphological characters of each plant were provided. MySQL server 5.5 was used for storing the information of accessions. The 'Wild Rice Species' tab shows general information on 24 recognized wild rice species, including their genome type, geographical distribution, habitat, morphological characters and specific trait values.
- (ii) Identified QTLs associated with salt tolerance in *Kharchia* 65, wheat cultivar in India known for salt tolerance.
- (iii) Single guide RNA constructs (sgRNA) constructs were made for the mango fruit fly, *Bactrocera dorsalis*, tomato fruit borer, *Helicoverpa armigera* and *Spodoptera litura* for genes governing egg development.
- (iv) Differential expression of anthocyanin pathway genes in 2 parents and 4 mango hybrids revealed higher fold expression in Chalcone synthase and Dihydroflavol reductase in red pigmented hybrids.
- (v) AKT (Protein Kinase B) stimulation at specified level during *in vitro* maturation significantly augments the early embryonic development following IVM, IVF and IVC.

The stimulation also downregulates the genes associated with apoptosis, but upregulates the genes associated with embryo proliferation and stemness.

- (vi) Significant association of polymorphism at promoter of *Stearoyl-CoA desaturase (SCD)* gene with serum cholesterol content in native chicken was found.

Conservation of Genetic Resources:

- (i) Three thousand eight hundred and seventy accessions comprising of cereals, vegetables, oilseeds, millets, narcotics and others were introduced from 14 different countries. The important accessions introduced were new source of inheritance for phyllody resistance in Sesame (EC961169-70) from Turkey, Potato varieties Camel, El Mundo, Everest and AFP08-59 having good eating quality, high yielding, drought tolerant (EC95970-959703) from Holland.
- (ii) Sixty one accessions were added to the National Genebank bringing the genebank holdings to a total of 4,38,639.
- (iii) Fifty-one specimens were added to the National Herbarium of Cultivated Plants bringing the holdings to a total of 23,549 specimens.

Natural Resource Management:

- (i) Developed organic farming package for Maize- Potato – Summer greengram system at Ludhiana (Punjab) with B:C ratio of 1.96:1.
- (ii) In silty loam soil drip irrigation of 80 per cent of PE and fertigation with 100 per cent nitrogen to *zaid* okra var. *Ankur* resulted in 33.6 per cent higher yield, 50.11 percent saving in irrigation water and 52.7 per cent increase in net return compared to flood irrigation.
- (iii) A simple and sensitive high performance liquid chromatographic method for estimation of dithiocarbamate pesticide formulation by HPLC-PDA was developed for quantification yellow complex obtained from dithiocarbamate fungicides (Mancozeb, Zineb and Propineb) in different formulation as well as food commodities.
- (iv) Severe incidence of leaf webber (30 to 50%) on mango was recorded in Mall and Malihabad during September. For its management farmers were advised to spray lamda-cyahalothrin @1ml/litre of water. After 15 days spray with quinalphos @ 1.5 ml/litre of water.
- (v) Three times sprays of Propiconazole @ 1 ml/l at an interval of 15 days were found effective in reducing Phoma disease incidence in tuberoses.

Development of Farm Implements, Machinery and Post - Harvest:

- (i) Developed site specific fertilizer applicator for cotton crop for top dressing of urea.
- (ii) Developed a tractor operated irrigation channel former.
- (iii) Developed a modular storage structure for bulk storage of onion.
- (iv) Developed production process for calcium enriched bread.
- (v) Developed convenient breakfast products using sprouting and extrusion technology.
- (vi) Developed filtration system for extraction of pectin.
- (vii) Process for preparation of low calorie moringa drinks with aspartame as artificial sweetener has been standardized.
- (viii) Developed drying techniques of *Dendrobium* orchids.

Public Outreach:

- (i) Frontline demonstrations on oilseed and pulses were taken up all over the country covering an area of 9079.14 ha and involving 25650 farmers.
- (ii) 442 field-days with the participation of 16114 farmers and 643 *Kisan Goshties/Melas* with the participation of 44714 farmers were organized.
- (iii) A total 3576 training courses for 93947 farmers, 653 trainings for 9372 rural youths and 441 trainings for 10293 extension functionaries and in-service personnel were organized in the frontline areas of technology development.
- (iv) Besides, KVK scientists undertook 8683 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 771 scientists visited 770 villages and organized 1336 demonstrations benefitting 53350 farmers. A total of 2375.74 quintals of seed and 17.84 lakh planting materials were also distributed to 4272 and 47665 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 16.10.2018 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) Launching of National Mission on Millets and National Year of Millets-2018: ICAR-IIMR, Hyderabad; DAC&FW, Govt. of India, New Delhi and Department of Agriculture, Government of Maharashtra jointly organized a National Level Workshop on Nutri-cereals (Millets) under National Food Security Mission (NFSM), at Vaikunth Mehta National Institute of Cooperative Management (VAMNICOM), Pune on 28 September, 2018. Shri Radha Mohan Singh, Hon'ble Union Minister of Agriculture & Farmers' Welfare, Govt. of India formally launched "National Mission on Millets" and "National Year of Millets-2018."

- (ii) Indian Council of Agricultural Research organized a two days Agri-Startup and Entrepreneurship Conclave for *Unleashing potential in agriculture for young agripreneurs* (UPAYA) during 16-17 October, 2018 at NASC Complex, Pusa New Delhi. The Conclave was inaugurated by Hon'ble Union Minister of Agriculture & Farmers' Welfare, Shri Radha Mohan Singh ji in the presence of Hon'ble Minister of State for Agriculture & Farmers' Welfare & Panchayati Raj, Shri Parshottam Rupala ji. The Plenary Session-I was chaired by Hon'ble Minister of Petroleum and Natural Gas; Minister of Skill Development and Entrepreneurship, Shri Dharmendra Pradhan ji; Prof. K Vijay Raghavan, Principal Scientific Advisor, Govt of India was the lead speaker. The Plenary Session-II was chaired by Hon'ble Minister of State for Agriculture & Farmers' Welfare, Shri Gajendra Singh Shekhawat ji with Mr Mark Kahn of Omnivore Partners as speaker. Six technical sessions on themes related to Agri-startups/Entrepreneurs were chaired by the eminent scientists/experts with lead speakers and discussants from different domains of agri-business/entrepreneurship ecosystem ICAR (ABI-Network) nurtured 104 agri-startups /entrepreneurs /licensees from different corners of the country exhibited their enterprise in the Conclave. About 700 participants attended the Conclave which included various stakeholders such as the farmers, self-help groups, business experts, policy makers, corporates, educational institutions and others who were interested to join hands and build together a better ecosystem for entrepreneurship in agriculture sector for enhancing income of the farmer. The Conclave showcased agri-startups /entrepreneurs /licensees on post-harvest technologies, seed & planting material, farm machinery, fish gadgets and plant protection methods etc. for sharing of success stories , enhancing awareness as well as exploring business and marketing linkages, technology & financial tie-ups and partnership opportunities.
- (iii) ICAR-Central Institute of Brackishwater Aquaculture signed a MoU with MoES, ESSO-NIOT (Earth System Science Organization-National Institute of Ocean Technology) for technical collaboration in expanding finfish cage culture operation in the depths from 5 to 100m.