

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

INTERNATIONAL COOPERATION:

- (i) A twenty eight member Nigerian delegation led by Major General GA Wahab (Rtd.) DG, Nigerian Army Resource Centre, ASOKORO, Abuja Nigeria visited Indian Agricultural Research Institute (IARI), New Delhi to explore possibilities of developing Indo-Nigerian cooperation in various areas of Agricultural Research and Education.
- (ii) A sixteen member Indonesian delegation led by Dr. Hermanto, Senior Researcher, Center for Agricultural Socio Economic and Policy Studies, Ministry of Agriculture, Republic of Indonesia visited IARI, New Delhi to exchange information regarding agricultural technologies and mechanism for dissemination of information & agricultural technologies among the farmers/stakeholders.
- (iii) Secretary (DARE) & DG, ICAR attended Executive Committee meeting of Asia Pacific Association of Agricultural Research Institutions (APAARI) on 13th June, 2019 at Bangkok, Thailand.

MAJOR RESEARCH ACHIEVEMENTS

Varietal Improvement:

- (i) Wheat Variety-WH1184 was released for cultivation in timely sown irrigated conditions in Haryana.
- (ii) IET 25484 (RP5960 patho-7-5-9) developed by marker assisted backcross breeding (MABB) contains Pi2 (against blast), has 95.6% genome similarity with Swarna, but superior to it was released for cultivation.

Agricultural Biotechnology:

- (i) Molecular characterization of around 20 insect species and 18 Bt isolates have been carried out and the sequence information are available at National Center for Biotechnology Information (NCBI) Database.
- (ii) Two major blast resistance genes, Pi1 and Pi54 along with one major QTL for grain yield under drought stress, qtl12.1 was introgressed into the paddy variety *Varalu*.
- (iii) Genotyping-by-sequencing (GBS) data was generated to identify and catalogue the SNPs in 13 Indian and 2 exotic cattle breeds. The PstI GBS library was prepared, purified and subjected for sequencing using Illumina platform. The raw DNA sequence data were processed through the GBS analysis pipeline as implemented in TASSEL v3.0.

Conservation of Genetic Resources:

- (i) A total of two hundred and sixty two accessions added to the National Genebank bringing the Genebank holdings to a total of 441253 accessions. Additionally, one thousand ninety three accessions of regenerated material was added to long-term conservation.
- (ii) Five thousand two hundred and thirty five accessions comprising of cereals, oilseeds, grain legumes, vegetables, millets and fibres were introduced from twelve different countries. The important accessions introduced were maize lines for silage and with stem borer resistance (EC979442-979458), from CIMMYT, Mexico.

- (iii) A total of three thousand eight hundred fifty five samples of imported exotic germplasm were processed for quarantine clearance and 3854 were released to indenters. *Tilletiabarclayana* on rice imported from the Philippines was an important pathogen interception. For export, 1174 samples were processed for quarantine clearance and 1168 samples were released. Seven phytosanitary certificates were also issued.

Natural Resource Management:

- (i) Developed organic farming package of practice of basmati rice on broad beds & *Sesbania* in furrows (*kharif*) – chickpea in broad beds and 2 rows of coriander in furrows (*rabi*) – greengram (summer) in broad bed and furrow system at Pantnagar (Uttarakhand) with B: C ratio of 2.76.
- (ii) In silty clay loam soil drip fertigation at 60% pan evaporation (PE) and 100% dose of nitrogen in okra (var. *Ankur*) resulted in water saving (37.9%) with 50.6% increase in yield as well as 111% increase in net income.
- (iii) Indian honey bee, *Apis cerana* was found to be the most important pollinator of buckwheat and was seen at the rate of 15.11 and 4.88 bees/ m²/ min during 8 and 10 AM, respectively.

Farm Implements, Machinery and Post - Harvest:

- (i) Developed retrofitting urea solution spraying system on paddy straw baler.
- (ii) Developed power operated tamarind dehusker and seed extractor.
- (iii) Developed sound absorption measurement apparatus for fabric.
- (iv) Developed a down scaled PV integrated low tunnel dryer for drying of green chilli.
- (v) Developed pellet stove for use of cotton stalk (biomass) pellets.
- (vi) Standardized protocol for gelatin and collagen peptide extraction from dried fish skin and bone.
- (vii) Cheese prepared from yak milk at various fat levels.
- (viii) Optimum temperature for storage of muskmelon was found to be 10°C at which fruits could be stored for 2 weeks with reduced weight loss and maintenance of colour, firmness and quality.

Public Outreach:

- (i) Frontline demonstrations on oilseed and pulses were taken up all over the country covering an area of 4792.77 ha and involving 13016 farmers.
- (ii) Organized 270 field-days with the participation of 5061 farmers and 293 *Kisan Goshties/Melas* with the participation of 15453 farmers.
- (iii) A total 2610 training courses for 50857 farmers, 1034 trainings for 5232 rural youths and 509 trainings for 6566 extension functionaries and in-service personnel were organized in the frontline areas of technology development.
- (iv) In *MeraGaonMeraGaurav* program, 626 scientists visited 561 villages and organized 436 demonstrations benefitting 31116 farmers. A total of 5080.40 quintals of seed and 6.41 lakh planting materials were also distributed to 10146 and 197990 farmers respectively.
- (v) During 20thApril– 19thMay, 2019, total 8 agro-advisory bulletins prepared in Hindi and in English by Subject Matter Specialists were sent to the farmers through Kisan portal. These advisories were also 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 were uploaded on the IARI website (www.iari.res.in).

- (vi) The ICAR's Seed Project Centres supplied 106761 chicks of improved poultry strains to the farmers and various stake holders across the country during last 1 month.

Application of Space Technology:

- (i) A unique satellite data reception centre has been established in the Division of Agricultural Physics. 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. <http://creams.iari.res.in>, which is available to all stakeholders for their own decision making.
- (ii) Agro-met advisory bulletins were prepared by IARI, New Delhi 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 in Hindi as well as in English. During May 20, 2019 – June 19, 2019, total 9 such agro-advisory bulletins prepared and SMS were sent to the farmers through farmers Kisan portal. These advisories were also 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 (www.iari.res.in)

Other Major Activities:

- (I) A web-based tool for Variety Identification System for *Triticumaestivum* (VISTA) was developed by Indian Institute of Wheat and Barley Research (IIWBR), Karnal. The study was recently published in Nature Scientific Reports.
- (II) Developed a Mobile App “m-Jhinga” on shrimp aquaculture in inland saline areas for the benefit of farmers.
- (III) A mobile App on Rice IPM developed in Telugu language, demonstrated and installed successfully benefitting over 75 farmers. This App is available in google play store <https://play.google.com/store/apps/details?id=org.iirr.varipirusasyarakshana&hl=en>.
- (IV) Cadalmin™ Antihypertensive extract (Cadalmin™ AHe), a nutraceutical product developed by Central Marine Fisheries Research Institute (CMFRI), Cochin was released as a natural remedy for hypertension.
- (V) Sunboat-II was launched at Matsyafed Fish Farm, Narakkal, Ernakulam, Kerala.
- (VI) Established National Referral Laboratory and Fish Behaviour Laboratory at ICAR-CIFT, Cochin.