

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

INTERNATIONAL COOPERATION:

- (i) A Work Plan for the period 2019-21 between ICAR and the Secretariat of Agriculture, Livestock, Fisheries and food of the Republic of Argentina has been signed on 18/2/2019.
- (ii) Collaborative Work Plan between ICAR and International Livestock Research Institute (ILRI) for the period 2019-22 was signed on 25th February, 2019
- (iii) Bilateral workshop on building an operational Composite Drought Monitoring Index for India was organised during Jan 22-23, 2019 under US-India 21st Century Knowledge Initiative Scheme on “Improving Water Management., Agricultural Production & Food Security in Drought-Prone Areas” at NASC Complex, New Delhi.
- (iv) 5th Asian Soil Partnership (ASP) Meet of Food and Agricultural Organization (FAO) organized during 26th February to 1st March, 2019 in New Delhi.

MAJOR RESEARCH ACHIEVEMENTS

Varietal Improvement:

- (i) Two bittergourd germplasms (IC-44438 and IC-44428) were identified for resistance to root knot nematode (*Meloidogyne incognita*).

Agricultural Biotechnology:

- (i) Serine hydroxyl methyltransferase-3 (*SHMT3*) gene was isolated from salt-tolerant (CSR27) rice. The functional characterization of *OsSHMT3* from salt-tolerant *OsSHMT3* exhibited salinity-stress induced accentuated and differential expression levels in different tissues of rice.
- (ii) DNA finger printing of long melon var. *Thar Sheetal* was completed.
- (iii) Generated transcription cassette containing the VP3 gene of chicken infectious anaemia virus with Newcastle disease virus gene start and gene end signals by overlapping PCR.
- (iv) the efficacy of iron inactivation upon *Pasteurella multocida* A:1 isolate in combination Protective antibody titres were induced by iron inactivated vaccine from 4th week of immunization and upon booster doses, it induced significantly higher antibody response. Specific antibody titres were assessed by ELISA in the serum at weekly intervals. The birds were challenged by intranasal route. The iron inactivated experimental vaccine gave equivalent protection as that of commercial vaccine upon challenge infection.

Conservation of Genetic Resources:

- (i) In germplasm conservation (*Ex-situ*), four hundred and forty two accessions were added to the National Genebank bringing the Genebank holdings to a total of 4 439932.
- (ii) Three thousand seven hundred and eighty six accessions comprising of cereals, vegetables, narcotics and forage were introduced from 13 different countries. The important accessions introduced were Wheat DH lines for screening against rust resistance (EC972065-972390) from Germany.

- (iii) Forty-six specimens were added to the National Herbarium of Cultivated Plants bringing the holdings to a total of 23701 specimens (as on January 31, 2019).

Natural Resource Management:

- (i) Developed organic farming package of practice maize (fodder) – berseem (fodder) – maize + cowpea (fodder) maize - berseem - bajra (fodder) system with B: C ratio of 2.29 at Ludhiana, Punjab.
- (ii) Drip fertigation in tomato (variety Hybrid-SHS) grown in silty loam soil at Faizabad, UP resulted in 22% increase in yield, 20 % saving in irrigation water and nitrogenous fertiliser compared to conventional irrigation and fertiliser application.
- (iii) Evaluation of mentha oil on the infestation of nematodes (*Meloidogyne graminicola*) revealed that average number of galls per seedling found on rice roots treated with different concentrations of mentha oil ranged between 4.66 -11.33 galls compared to 18.66 in between 80(4%) till 7th day of inoculation.

Development of Farm Implements, Machinery and Post - Harvest:

- (i) Developed a tractor front mounted hydraulically operated two row pigeon pea harvester.
- (ii) Developed an automatic irrigation system for rice.
- (iii) Developed vertical cup type vegetable transplanter for cell feed nursery.
- (iv) Passive Infrared (PIR) sensor based safety alarm system for fodder cutting machine developed.

Public Outreach:

- (i) Frontline demonstrations on oilseed and pulses were taken up all over the country covering an area of 12601.97 ha and involving 34576 farmers.
- (ii) 418 field-days with the participation of 14370 farmers and 525 *Kisan Goshties/Melas* with the participation of 70997 farmers were organized.
- (iii) A total 3835 training courses for 87420 farmers, 1287 trainings for 9843 rural youths and 460 trainings for 7119 extension functionaries and in-service personnel were organized in the frontline areas of technology development.
- (iv) In *Mera Gaon Mera Gaurav* program, 801 scientists visited 724 villages and organized 1320 demonstrations benefitting 45053 farmers. A total of 3668.50 quintals of seed and 29.84 lakh planting materials were also distributed to 7104 and 32619 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 17.02.2019 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) ICAR-CIFRI successfully registered trademarks of four technologies namely CAGEGROW[®], CIFRI GI CAGE[®], CIFRI PEN HDPE[®], and CIFLIN[®] in the name of “Indian Council of Agriculture Research” in the Trade Mark Registry of Government of India at Mumbai.
- (ii) ICAR-CIFRI organized ranching of 10000 fingerlings of IMC (Indian major carp) at Sangam, Prayagraj Kumbh Mela. The ranching was performed by Shri Nitin Gadkari, Hon’ble Union Minister of Shipping, Road Transport & Highways, Water Resources, River Development and Ganga Rejuvenation.