

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

INTERNATIONAL COOPERATION:

- (i) Shri Chhabilendra Roul, AS (D) & Secretary, ICAR and Dr. J.K. Jena, DDG (Animal Sciences), ICAR visited International Livestock Research Institute (ILRI) and International Center for Research in Agroforestry (ICRAF) Headquarters in Nairobi to meet their Senior Management/ Scientists and to meet with Secretary, African Union in Addis Ababa, Ethiopia During 13-16 February, 2018. a) To explore the possibility of leveraging Indian Expertise in Agricultural Sciences in African countries through the CGIAR Centres like International Livestock Research Institute (ILRI), International Centre for Research in Agro Forestry (ICRAF) and International Centre for Agricultural Research in Dry Areas (ICARDA) due to their significant presence in Africa. b) Reviewing the progress relating to projects undertaken / to the undertaken under Indo Africa Forum Summit (IAFS) held in 2008, 2011 and 2015. The projects are Soil, Water and Tissue Testing Laboratories, Agricultural Seed Production cum Demonstration Centres, Farm Science Centre in Ethiopia and establishment of Pan African University of Life & Earth Sciences (PAULESI) at University of Ibadan, Nigeria.

MAJOR RESEARCH ACHIEVEMENTS

Varietal Improvement:

- (i) HS628, a rust resistant plant genetic resource was developed carrying resistance to all the pathotypes of black rust including newly evolved pathotype 40-3.
- (ii) Three strains of garden pea were identified (VP907 Early), VP1018 & VP 1208 (Medium) for cultivation.
- (iii) A new salt tolerant high yielding variety of Indian mustard (CS 58) released for cultivation.
- (iv) One variety of cardamom (Appangala 2) has been notified for cultivation.
- (v) IISR *Pragati* a turmeric variety has been notified for cultivation.

Agricultural Biotechnology:

- (i) A MIGS construct was developed for resistance against cotton leaf curl geminiivirus (by targeting *AC1*, *AC2* and *βC1* genes from beta satellite), root knot nematode (by targeting *flp-14* and *flp-18* genes) and cotton leaf hopper (by targeting *vATPase* and *COP3* genes).MIGS-transgenic *Nicotiana benthamiana* was developed by *Agrobacterium*-mediated genetic transformation and transgene integration was confirmed by PCR using gene-specific primers.
- (ii) Forty five SSR (Simple sequence repeats) markers have been tested to identify polymorphic markers in 15 paddy varieties. Among them, RM-452 and RM-316 were found to be polymorphic which can differentiate 15 paddy varieties cultivated.
- (iii) Functional characterization of potato maturity locus CDF (cation diffusion facilitator) allele for tuberisation 1. This effort will be used for developing potato under diverse potato cultivation.
- (iv) Cloned porcine Elongase 6 (ELOVL6) gene from bone marrow derived mesenchymal stem cell line demonstrated that the gene could be expressed in human cell line

(heterologous system), implying the biocompatibility of porcine and human cellular system with regard to the regulation of fatty acid elongation process.

- (v) Identified nine buffalo specific SNPs (Single nucleotide polymorphisms) in micro RNAs associated with Corpus Luteum tropism in buffaloes which maintains cyclicity to resume optimum reproductive status of animals.
- (vi) Developed cell line from caudal fin of striped catfish, *Pangasianodon hypophthalmus*. This will help in investigation of disease outbreaks of viral etiology in striped catfish and for functional genomics and *in vitro* cytotoxicity studies.

Conservation of Genetic Resources:

- (i) Two thousand seven hundred and ninety five accessions comprising of cereals, millets, grain legumes, oilseeds, vegetables and fruits were introduced from 15 different countries. The promising accessions introduced were superior quality and best tasting sea buckthorn berries (EC935319-935320) from Russia.
- (ii) One hundred and twenty six accessions were added to the National Genebank bringing the genebank holdings to a total of 4, 35, 072 (as on 31st January 2018).
- (iii) One thousand four hundred twenty five accessions of regenerated material were added to long-term conservation.

Natural Resource Management:

- (i) Developed organic farming package of practice for green manure (sunhemp)-scented rice-durum wheat system with B:C ratio of 1.94 at Jabalpur (Madhya Pradesh).
- (ii) Compatibility of three potent chitinolytic *Bacillus* isolates (UKCH31, UKCH17 and UKCH77) with six different pesticides at their field recommended concentrations revealed Indoxacarb was relatively safe.
- (iii) Intercropping of Pigeonpea and Castor (1:1) and urdbean/mungbean and sunflower (4:2/2:1) is recommended for cultivation.
- (iv) Seed treatment with metalxyl (3g/kg seed) with ridge sowing and raising cover crop of cowpea, mungbean is recommended for better production.
- (v) *In vitro* bioassay of *Trichoderma longibrachiatum* (ITCC 6987) against *Meloidogyne incognita* showed 100% immobility and mortality at 100% concentration.

Development of Farm Implements, Machinery and Post - Harvest:

- (i) Tractor drawn three row vegetable transplanter for paper pot seedlings developed.
- (ii) Multi-crop planter for bed sowing developed.
- (iii) Portable briquetting machine for paddy straw developed.
- (iv) Process technology for whole grain fermented pearl millet flour and sprouted grain based pasta development.
- (v) Antimicrobial coatings process for extending shelf-life of winter guava developed.
- (vi) Harvesting of red colour capsicum at half maturity (half red) stage is advisable for extending the storage life of red colour capsicum for 4 weeks at 8°C without affecting the quality as compared to 3/4th and full red colour maturity stages red colour capsicum.
- (vii) Jack fruit seed powder (JFSP) fortified biscuits were developed which showed increase in fibres by six times, antioxidants by one & half times and low glycemic index.

- (viii) Fish feed 'CIFRI-CAGEGROW' for cage farming of *Pangasianodon hypophthalmus* developed and testing performance elucidated better growth and feed conversion ratio (FCR) of 1.2.

Public Outreach:

- (i) Frontline demonstrations on oilseed and pulses were taken up all over the country covering an area of 12969.33 ha and involving 31135 farmers.
- (ii) 500 field-days with the participation of 24377 farmers and 476 *Kisan Goshties/Melas* with the participation of 64953 farmers were organized.
- (iii) Over 4162 training courses for 96031 farmers, 572 trainings for 10731 rural youths and 377 trainings for 8354 extension functionaries and in-service personnel were organized in the frontline areas of technology development.
- (iv) Besides, KVK scientists undertook 8373 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 663 scientists visited 616 villages and organized 703 demonstrations benefitting 37787 farmers. A total of 7612.19 quintals of seed and 24.92 lakh planting materials were also distributed to 7491 and 25569 farmers respectively.
- (vi) 32400 frozen semen doses of Frieswal bulls were produced for insemination of crossbred cattle at Military Farms and farmers' herd.
- (vii) During the month, vaccinations with 27300 doses of *Ranikhet Disease (RD)*, 2700 doses of *Infectious Bursal Disease (IBD)*, 23400 doses of *Marek's disease* and 1800 doses of fowl pox were carried out in broiler, layer, turkey, guinea/*desi* fowl/emu.
- (viii) Test kit 'CIFLIN' for detection of formaldehyde adulteration in fish has been developed and field tested under Food Safety and Standards Authority of India (FSSAI) funded project.
- (ix) National Collection of Dairy Cultures (NCDC) supplied 45 nos. freeze dried cultures to 6 cooperative dairy and milk plants in private sector for fermented milks and cheese; and microbial strains to 6 educational institutes for teaching and research purposes.

Application of Space Technology:

- (i) One Indian Regional Navigation Satellite System (IRNSS) through ISRO as a part of Ministry of Earth Science project entitled "To explore the potential application of Infrasonic supported by Ionosonde, GPS and Sodar for Earthquake Precursor Studies" is regularly being used for data collection. Weekly data files till 09.02.2018 have been sent to NPL Delhi.
- (ii) 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.
- (iii) A unique satellite data reception center has been established in the Division of Agricultural Physics at IARI. These data are being used for monitoring crop health and drought condition in all the districts of the country. This information is regularly updated on the web portal <http://creams.iari.res.in>, which is available to all stakeholders for decision making.

- (iv) The web enabled Decision Support System (DSS) for near real time crop growth monitoring for India based on multi-temporal satellite remote sensing data was improved by addition of new satellite derived crop condition monitoring product of NDVI Deviation (NDVIdev) and improving the spatial and temporal resolution of existing products of Vegetation Condition Index (VCI) and Temperature Condition Index (TCI).
- (v) Agro-met advisory bulletins are being prepared 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 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. During January 20, 2018 - February 19, 2018, total 8 agro-advisory bulletins were prepared in Hindi as well as in English and SMS were sent to the farmers through farmers Kisan portal. These advisories are 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.

OTHER MAJOR ACTIVITIES:

- (i) The President of India, Shri Ram Nath Kovind, graced and addressed the 56th convocation of the Indian Agricultural Research Institute (IARI) on 9th February, 2018. Speaking on the occasion, the President said that IARI played a critical role in the Green Revolution that changed the course of food production in the country. He was happy to note that students from 14 countries are being educated in this institution and that IARI is helping in the development of agricultural capacities and research in neighbouring countries. Union Agriculture and Farmers Welfare Minister, Shri Radha Mohan Singh was also present at the function where presentation of the achievements of the research scholars took place.
- (ii) The Union Minister of Agriculture and Farmers' Welfare Shri Radha Mohan Singh addressed the 89th Annual General Meeting (AGM) of Indian Council of Agricultural Research (ICAR) society at National Agricultural Science Complex (NASC) in Pusa, New Delhi on 28th February. Shri Singh congratulated ICAR for completing 88 glorious years and lauded the institution for having braved the odds despite challenging circumstances to achieve notable success in improving agriculture system and enhancing agriculture production and productivity in the country thereby increasing income of the farmers, especially the small and marginal farmers. The minister said that ICAR has taken important steps towards fulfilling Prime Minister's vision of doubling farmer's income by 2022. The ICAR has also done notable work in the field of developing new technologies, integrated farming systems, institution building, human resource, diversification in agriculture, creating new opportunities and developing new sources of information. The ICAR is committed to making Indian agriculture more sustainable and beneficial. Shri Gajendra Singh Shekhawat, Union Minister of State for Agriculture and Farmers' Welfare; Shri Parshottam Rupala, Union Minister of State for Agriculture and Farmers' Welfare and Panchayati Raj and Smt. Krishna Raj, Union Minister of State for Agriculture and Farmers' Welfare; Shri

Mahadev Jagannath Jankar, Minister for Animal Husbandry, Dairy Development and Fisheries Development, Maharashtra; Shri Pocharam Srinivas Reddy, Minister of Agriculture and Horticulture, Telangana; Shri Sanjay Dhotre, Member of Parliament (Lok Sabha); Shri Surya Pratap Shahi, Minister of Agriculture, Uttar Pradesh; Dr. Ram Lal Markanda, Minister of Agriculture, Himachal Pradesh; Shri Prem Kumar, Minister of Agriculture and Horticulture, Bihar; Shri Ghulam Nabi Lone, Minister for Agriculture Production, Jammu & Kashmir; Shri Abdul Ghani Kohli, Minister for Animal, Sheep Husbandry and Fisheries, Jammu & Kashmir; Shri Udumalai Radhakrishnan, Minister for Animal Husbandry, Tamil Nadu and Shri Thalavai Sundaram, Special Representative, Govt. of Tamil Nadu were also present on this occasion.

Secretary (DARE) & DG, ICAR

D.O.No.: 4(1)/2018 CDN (Tech.)

Dated: 5th March, 2018

I am enclosing brief note on the significant achievements relating to the Department of Agricultural Research and Education (DARE) for the month of February, 2018.

Yours Sincerely,

Encl: As above.

(Trilochan Mohapatra)

Shri Pradeep Kumar Sinha
Cabinet Secretary
Cabinet Secretariat
Rashtrapati Bhavan
New Delhi – 110004

Draft e-mail to Sh. Pradeep Kumar Sinha, Cabinet Secretary
(email: cabinetsy@nic.in, subhag@nic.in)

Dear Sir,

I am enclosing monthly summary relating to the Department of Agricultural Research & Education (DARE) in the given format for the month of February, 2018.

Regards,

Yours sincerely

Trilochan Mohapatra



Indian Council of Agricultural Research

Krishi Bhavan, New Delhi

COORDINATION UNIT

F.No. 4(1)/2018-CDN(Tech.)

Date: 05/03/2018

Sub: Monthly DO Letter from Secretary Department of Agricultural Research & Education DARE to Cabinet Secretary, reporting the important activities of the Department for month of February, 2018.

On the basis of material received from the Subject Matter Divisions, other Divisions of ICAR, ICAR Institutes and the D.G. Office, a monthly DO letter from Secretary, DARE to Cabinet Secretary reporting the important activities of the Department for the month of February, 2018 has been prepared (Flag 'A').

Draft D.O letter is placed below for kind perusal and approval please.

(A. S. Mishra)
Principal Scientist

ADG (TC)

A brief report relating the activities of DARE for the month of February, 2018 was prepared on the basis of the information received from SMDs/Institutes. A copy has already been forwarded to the Cabinet Secretary. For further circulation the copy of the report along with its Hindi translation is placed for signature of Secretary, DARE & DG, ICAR.

(A. S. Mishra)
Principal Scientist

ADG (TC)

Secretary (DARE) & DG, ICAR

**F.No. 4(1)/2018 CDN (Tech.)
GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION
KRISHI BHAVAN: NEW DELHI-110001**

Dated:

The undersigned is directed to circulate herewith a copy of the Monthly Summary of the Department of Agricultural Research & Education for the month of February, 2018.

**(Shiv Prasad Kimothi)
Asstt. Director General (Coord.)**

Encl: As above

To

All Members of the Council of Ministers.

Copy with enclosures forwarded to:-

1. Chairman,
Union Public Service Commission,
Shahjahan Road,
New Delhi
2. Secretary to the President,
Rashtrapati Bhavan,
New Delhi
3. Secretary to the Vice-President,
6, Maulana Azad Road,
New Delhi
4. Member of NITI Aayog,
NITI Aayog Bhawan,
New Delhi
5. All DDGs
6. Director DKMA
7. DS (WS)
8. Dr. K.P. Singh, Pr. Sci., e-Governance Div., ICAR

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GOVERNMENT OF INDIA
MINISTRY OF AGRICULTURE
DEPARTMENT OF AGRICULTURAL RESEARCH & EDUCATION
KRISHI BHAVAN: NEW DELHI-110001

Dated:

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(Shiv Prasad Kimothi)
Assistant Director General (Coord.)

To

The Principal Information Officer, Ministry of Information & Broadcasting.

Copy with Copy of the summary forwarded to:-

1. Secretary, Deptt. of Telecommunication.
2. Secretary, Deptt. of Education, Shastri Bhavan, New Delhi
3. Secretary, Deptt. of Statistics, Sardar Patel Bhavan, New Delhi
4. Secretary, Deptt. of Scientific & Industrial Research, Technology Bhavan, New Mehrauli Road, New Delhi.
5. Secretary, Legislative Deptt., Shastri Bhavan, New Delhi
6. Secretary, Deptt. of Non-Conventional Energy Resources, Block 14, C.G.O. Complex, Lodi Road, New Delhi.
7. Secretary, Deptt. of Water Resources, Shram Shakti Bhavan, New Delhi.
8. Secretary, Urban Development, Nirman Bhavan, New Delhi
9. Secretary, Deptt. of Rural Development, Krishi Bhavan, New Delhi