Training/Capacity Building Programmes Organized

- ICAR sponsored 10-days Short Course on "Advances in sugarcane mechanization technologies to reduce cost of operations and drudgery for enhancing farmers' income" (September 16-25, 2019)
- ITI apprenticeship trainings
- One month Summer and Winter Trainings for students of B. Tech. (Ag. Engg.) of SHUATS, Prayagraj and MCAET, Ambedkar Nagar
- Five Skill Development Residential Trainings
- Several residential and off campus training programmes
- UG/PG students trained : 68 and Ph.D awarded: 2
- Sixty seven training courses for participating farmers, farm women on various topics with an objective to improve skill and upgrade their knowledge about developed and potent product.
- Entrepreneurship training for promoting agri-business
- Sixteen residential training programmes for cane development personnel, students and sugarcane farmers

Outreach Programme

- Four farmers were trained as entrepreneurs for seed cane business.
- Total 3533.20 t healthy seed cane was produced in farmers' field.
- A farmers' club of more than 100 t/ha cane yield was formed in Biswan sugar mill area.
- Seven Field days were organized in Sitapur, Ballia, Lakhimpur Kheri and Ayodhya districts of Uttar Pradesh.
- **Exhibition organized :** Three exhibitions at Haidergarh, Barabanki U.P.; Acharya Narendra Dev Inter College, Deoria, U.P. and VSI, Pune, Maharashtra
- **Frontline Demonstrations (FLDs):** 1290 in 223.18 ha area
- **On Farm Testing/Trials (OFTs):** 4

Linkages Developed

- With ITC Ltd for skill development of progressive farmers and NGO personnel in water saving cane technologies, SSI & seed cane business.

Awards and recognitions

- ICAR-IISR, Lucknow bagged ICAR Rajshri Tandon Award.
- Drs. A.D. Pathak, Amaresh Chandra, Sangeeta Srivastava, A.K. Singh, S.N. Sushil and Rajesh Kumar received Fellow Award -2019 of Society for Sugar Research and Promotion, New Delhi.
- Dr. Sangeeta Srivastava received "Outstanding Scientist Award 2019" in ICAHFS-*2019"*.
- Dr. Rajesh Kumar received UPAAS Fellow.
- Dr. S.N. Singh received Award of Excellence-2019 by SSRP, New Delhi.
- Dr. A.K. Sah received *Harit Kranti* Award-2019 from AIASA.
- Dr. A. Chandra received Prof R. Kumar Distinguished Agricultural Scientist Award from UPAAS.
- Dr. A. Chandra was offered to join as Associate Editor of BMC Plant Biology (Section: Genetics and Crop Biotechnology) since 2019.
- Dr. A. Chandra received Best Scientist Award (IISR 68th Foundation day).
- Dr. Viveka Nand Singh received Excellence in Extension Award" from Green Agri Professional Society, Dhanbad.
- Dr. A.K. Sah elected as Vice-President (Central Zone) of Indian Society of Extension Education.

Major Events Organized

- Sugarcon-2019-International Sugar Conference and *Ikshu* Fest-2019 from February 16-19, 2019
- *Pradhan Mantri Kisan Samman Nidhi Karyakram Evam Kisan Mela* on February 24, 2019
- NAAS Lucknow Chapter (March 1, 2019), Dr. A.K. Srivastava, Chairman, ASRB, New Delhi delivered a special lecture.
- 30th Foundation day of UPAAS and one day Seminar on Priorities and Strategies to Boost Farmer's Income on June 14, 2019
- NEEDEF Foundation day and one day Seminar on June 20, 2019
- One day Farm Machinery Entrepreneurship Seminar and Expo-2019 on October 24, 2019
- One-day Conference on Sugarcane-Is there any Alternative?" on November 11, 2019
- National Workshop on Sugarcane: Challenges and Future Strategies for Doubling the Farmers' Income on November 14, 2019
- One day Brain Storming Meet on "Nanotechnology Application in Sugarcane" on January 10, 2020.
- Workshop on "Roof Top Kitchen Gardening: An Initiative" & Farmers Fair on January 28, 2020.

Publications

Research Papers (48); Presentations/Papers/Abstracts in Seminar/Symposia/Conference: International and National (175); Technical Bulletins (1); Souvenir (4); Training Manual/Compendium of Lectures (2), Popular Articles (34); Folders/ Extension Leaflets (5); Annual Report (2); Newsletter (2); *Ikshu* (2) and *Kisan Jyoti* (1)

Personnel

New joining on transfer: 3 (Scientist-2; Administration-1)

Promotion: Scientists: 2; Technical:4 and Administrative:2

Superannuation:12 (Scientist-1; Technical-7; Administrative:3; Supporting-1)

IISR in Sports

- IISR grabbed silver medals in Table Tennis Team (Men) event & Table Tennis (Singles) Women in ICAR North Zone Sports Tournament.

Visits abroad

- Dr. A. Chandra attended International Conference on Agricultural and Biological Sciences at Macau, China (July 21-24, 2019).
- Dr. A.K. Singh attended Seminar on Agricultural Technology Innovation for South Asian Countries at Huoying, P.R. China (May 27-June 4, 2019).
- Dr. M. Swapna attended 30th ISSCT, "Growing Energy: The Next Page" held at Tucuman, Argentina (September 1-5, 2019).

Published by
Dr. A.D. Pathak, Director, ICAR-IISR Lucknow

Compiled and Edited by
Dr. A. Chandra, Dr. D.R. Malaviya, Dr. D. Joshi,
Sh. Brahm Prakash and Dr. Anita Sawnani

भाकृअनुप
ICAR

भारतीय गन्ना अनुसंधान संस्थान, लखनऊ
ISO 9001 : 2015

69th Foundation Day
February 16, 2020

YEAR AT A GLANCE

ICAR-Indian Institute of Sugarcane Research
Lucknow - 226 002, Uttar Pradesh, India
Tel: +91-522-2480726, 2961318; Fax: +91-522-2480738
E-mail: director.sugarcane@icar.gov.in
www.iisr.icar.gov.in

ICAR-Indian Institute of Sugarcane Research (IISR), established on February 16, 1952 by the Indian Central Sugarcane Committee is an ISO 9001:2015 accredited Institute with its regional centre at Motipur, Muzaffarpur (Bihar); Biological Control Centre at Pravaranagar (Maharashtra) and Sugar Beet Breeding Outpost at Mukteshwar (Uttarakhand). It comprises five divisions *viz.*, Crop Improvement, Crop Production, Crop Protection, Plant Physiology and Biochemistry and Agricultural Engineering, working coherently to improve sugarcane and sugar productivity. The scientific strength of the Institute is 74 who are supported by 134 technical, 51 administrative and 74 skilled support staff. The Institute houses coordinating unit of All India Coordinated Research Project (AICRP) on Sugarcane. It also houses Krishi Vigyan Kendras (KVK) at Lucknow and Lakhimpur Kheri.

Vision

An efficient, globally competitive and vibrant sugarcane agriculture

Mission

Enhancement of sugarcane productivity, profitability and sustainability to meet future sugar and energy requirement of India

Research Achievements

- Two sugarcane varieties *i.e.* CoLk 12207 (*Ikshu*-6; early maturity group) and CoLk 12209 (*Ikshu*-7; mid-late maturity group) were released for commercial cultivation in the North Central and North Eastern Zones of India.
- Three early maturing sugarcane clones *i.e.* CoLk 19201 (LG 12429), CoLk 19202 (LG 12040) and CoLk 19203 (LG 11067) and one mid-late maturing clone CoLk 19204 (LG 10723) were accepted for multi-location testing in the North West Zone of India.
- Proposals of two sugarcane varieties namely, CoLk 11203 (Ikshu-5) and CoLk 11206 (Ikshu-4) were submitted to PPV & FRA for registration under the Protection of Plant Variety and Farmers Right Act, 2001 for their protection.
- Production of disease-free and genetically pure seed cane through micro-propagation of new sugarcane varieties CoLk 12207 and CoLk 12209 was done through enhanced axillary shoot proliferation.
- Total 7176 samples were tested for virus indexing and genetic fidelity in DBT Accredited Test Laboratory.
- Approximately 61,200 quintals of seed cane was produced.
- Autumn sugarcane at 120 cm row spacing + garlic (1:5 ratio) produced maximum yield (140.48 q/ha) and fetched the highest net income of ₹7,72,622/ha. Sugarcane at 150 cm row spacing + maize green cobs (1:3 ratio), fetched the next best net income of ₹5, 93,111/ha.
- Among sugarcane weed management practices, Ametryn @ 1,500 g/ha, 2, 4-D @ 2,000 g/ha, Metribuzin @ 1,250 at 30 DAS, managed the *Ipomea* spp efficiently.
- Micro-irrigation techniques comprising surface and sub-surface drip irrigation methods have been developed with an aim of saving 70% of irrigation water.
- Post-harvest deterioration of cane quality, harvested during May/ June, after 11 days in terms of sucrose % juice was more in CoLk 09204 (39.8%) as compared to CoPK 05191 (20.7%).
- Chemical formulation (BKC+SMS) has reduced the level of cane deterioration in cane harvested late in the month of May/June.
- Genome of a virulent pathotype (Cf 08) of *C. falcatum* causing red rot of sugarcane was sequenced and raw reads submitted at NCBI under Bioproject PRJNA509540. A total of 238 contigs were submitted and 18,635 protein-coding genes were predicted.
- Functional annotation of red rot pathogen genome revealed different classes of genes having important role in plant-pathogen interaction. The genome sequences of *C. falcatum* is closely related to *C. graminicola* and *C. sublineola*, the causal organisms of anthracnose in maize and sorghum.
- A black beetle, *Heteronychus* sp. and a black Delphacid plant hopper, *Eoeurysa flavocapitata* has been reported from sugarcane.
- *Tetrastichus howardi* being a potential pupal parasitoid of all borers of sugarcane, *Tetrastichus* card has been developed for its delivery in the cane field.

- Three strains of *Trichoderma viz*., STr-64, STr-83 and STr-126 were found promising for suppressing red rot infection and enhancing germination and cane yield
- Three pathotypes of *C. falcatum* namely Cf 07 (NAIMCC–F-03382), Cf 08 (NAIMCC–F-03383) and Cf 09 (NAIMCC–F-03384) from sub tropical zone were deposited at ICAR-NBAIM, Mau.
- Two row disc type ratoon management device with and without stubble shaving attachments was made and two prototypes were developed. Effective field capacity of the machine was 0.35-0.40 ha/h.

- Tractor operated multipurpose tool frame with attachments for sugarcane were developed/ evaluated and demonstration of the same was made at farmer's field.
- Tractor operated cane node planter was developed and demonstrated in field.
- A prototype of solar powered manual sprayer was developed for spraying herbicide /fungicide in various crops.
- Public-Private-Farmer Partnership (PPFP) model in sugarcane to double the farmers' income and Entrepreneurship model in seed cane production were developed.
- Four Model farms were developed for facilitating Farmer-to-Farmer Extension.
- A web based reporting system for the trials of AICRP on Sugarcane was developed.

Technology commercialized

- Application of endophytic nitrogen fixing and phosphate solubilizing bacteria for reducing chemical fertilizer load on soil *vis- a-vis* promoting crop growth and yield.
- IFS model like sugarcane + banana + papaya based intercropping system was found profitable module along with bee-keeping and mushroom cultivation.
- Sett priming with 100 ppm ethrel for early and higher germination leading to higher cane yield.

Externally Funded Projects Launched

- RKVY project- Establishment of quality jaggery production-cum-training units in selected districts of UP for income generation & entrepreneurship development
- RKVY project- Establishment of quality soil testing laboratory for soil health management.
- DST project under Women Scientist Scheme B-Modified atmosphere packaging of sugarcane juice in closed system
- SERB project-Source-sink dynamics in sugarcane–a global transcriptome analysis to decipher factor(s) controls sucrose content in cane stalk/culm
- Number of contract projects – 14 (₹ 140 lakh)

MoUs/MoAs Signed

- With DST- Institute of Nano Science and Technology, Mohali for collaborative research work on Nanofertilizers
- With Grasim Industries Ltd. for commercial manufacturing and distribution of nitrogen fixer and phosphate solubilizing bacteria
- With Sugarcane Industries Department, Government of Bihar, for quality seed cane production in Bihar with an outlay of ₹ 12 crore for 5 years
- With University of Lucknow, Lucknow; GLA University, Mathura; ITM University, Gwalior; CCS University, Meerut and SR Institute of Technology & Management, Lucknow
- With DCM Shriram for analysing and determining best practices for water efficiency and soil moisture
- With M/s Tuture Farmers LLP, 207-A Bhagwan Parisar, Hoshangabad Road, Misrod, Bhopal (M.P.) and Smt. Sandhya Rao W/o Shri Gorakhnath Rao, Village & Post- Bakhra, Distt. Deoria, U.P. for jaggery production.