

From the Director's Desk

Jaggery for profitability and sustainability of sugarcane cultivation



Sugarcane, the main source of sugar in India, is also an important source of several other by-products. Jaggery, the traditional sweetener with its high nutritive value, is important among these by-products. Around 20% of the sugarcane produced is diverted towards Gur and Khandsari production annually. Gur and Khandsari form an important cottage industry in the country, employing around 25 lakh workers for various operations. India produces approximately 6-8 MT jaggery annually, contributing about 70% of the total jaggery produced in the world. The states of Uttar Pradesh, Maharashtra, Tamil Nadu, Karnataka and Andhra Pradesh produce 80-90% of the total jaggery in the country. With a high nutritional composition, jaggery has the potential to overcome malnutrition which is prevalent in several pockets

of the country.

The challenges for sugarcane farmers are many, low prices for the cane supplied, delay in commencement of crushing season, mounting cane price arrears etc., being a few among them. Many a times, the farmer finds it difficult to ensure timely harvest of their crop for vacating his field for the next crop. Under such circumstances, this small scale industry of jaggery can be a boon to sugarcane growers. The diversion of the cane towards jaggery production can be remunerative to the grower in such situations. Besides, these jaggery units encourage entrepreneurship among the sugarcane farmers.

In areas where the number of sugar mills is less, establishment of jaggery units and diversion of canes to these units can be an alternative source of income. This will also provide an incentive for farmers to grow sugarcane in their field. Establishment of state-of-the-art jaggery units, modernization of existing units, use of modern technological interventions with emphasis on hygienic value-added jaggery, product diversification etc., are vital for the upliftment of this cottage industry. A well planned marketing system should also be in place along with the other improvements, to help the stakeholder reap the benefits.

IISR has initiated efforts in this direction in Bihar in the district of Muzaffarpur, at its Regional Centre, Motipur, where the network of sugar mills is very poor. The adjoining areas of Muzaffarpur had one sugar mill which is not operational for the past several years. This has been a main obstacle for sugarcane cultivation to flourish in these areas. Modern jaggery units are being planned here so that in the absence of sugar mills, the sugarcane growers have the option of producing jaggery from the harvested cane. This will ensure the economic as well as the nutritional security of the growers. Besides, this will be an impetus to entrepreneurship for the farmers, adding to the profitability and sustainability of sugarcane agriculture.

Let us hope that this will also pave the way for revival of this important cottage industry which for the past few years, had remained neglected.

- कुल गन्ना उत्पादन का लगभग 20 प्रतिशत हिस्सा गुड़ और खाण्डसारी बनाने के लिए प्रयोग होता है।
- गुड़ और खाण्डसारी उद्योग में लगभग 25 लाख लोगों को रोजगार प्राप्त है।
- विश्व का लगभग 70 प्रतिशत गुड़ उत्पादन भारत द्वारा किया जाता है, जो लगभग 60-80 लाख टन वार्षिक है।
- पूरे देश का 80-90 प्रतिशत गुड़ उत्पादन उत्तर प्रदेश, महाराष्ट्र, तमिलनाडु, कर्नाटक और आंध्र प्रदेश द्वारा किया जाता है।
- जिन राज्यों में चीनी मिलें कम हैं, उन राज्यों के लिए गुड़ उत्पादन किसानों की आय का एक महत्वपूर्ण विकल्प है।
- गुड़ उत्पादन से किसानों को अधिक लाभ के साथ-साथ पोषण सुरक्षा भी प्राप्त होती है।



हर कदम, हर उभार
किसानों का हमसाथ
भारतीय कृषि अनुसंधान परिषद

Agriculture search with a human touch

A.D. Pathak

(A.D. Pathak)

SECTORAL NEWS: SUGARCANE AND SUGAR INDUSTRY

Seminar on “Harnessing energy feed stocks for sustainability of sugar industry in sub-tropical India”

Brainstorming Seminar was organized jointly by ICAR-Indian Institute of Sugarcane Research, Lucknow, North Indian Sugarcane & Sugar Technologists' Association of India and Directorate of Sugarcane Development, Govt. of India on 22nd August, 2015 at IISR, Lucknow, to deliberate upon the possible ways and means to sustain the sugar industry through diversification. Dr P.K. Seth, CEO, Biotech Park, Lucknow was the Chief Guest.

In his welcome address, Dr. O.K. Sinha, Director, IISR stressed upon the current problems faced by the sugar industry and an urgent need for diversification to bio-ethanol and bio-energy using alternate feedstocks like sugar beet. Dr Ram Murty Singh, President, NISSTA; Shri.K.P. Singh, Executive President, Balrampur Sugar Group; Dr. M.C. Diwakar, Director, Directorate of Sugarcane Development; Mr. A.K. Shukla, General Secretary, NISSTA, Dr. Bakshi Ram, Director, Sugarcane Breeding Institute, Coimbatore and others spoke about the need for diversification in the industry. Dr. Narendra Mohan, Director, National Sugar Institute (NSI), Kanpur, in his keynote address, emphasized upon dual pricing of sugar for domestic and commercial market, effective branding and packaging of sugar, integrated complexes, B-heavy molasses for ethanol production and better Industry-Research Institute collaborations.

In technical Session, view points on various ways of ethanol production using feedstocks like sugar beet and cassava, apart from sugarcane were discussed. The possibility of making second generation (2G), third generation (3G) and fourth generation (4G) ethanol from non-edible plant parts, from algae and from genetically engineered organisms, respectively, was discussed by Dr. Pushpa Singh, Principal Scientist, IISR, in her lead lecture “Ethanol Production, Emerging Technologies and Sustainability Issues”.

- संस्थान में 22 अगस्त 2015 को ब्रेन स्टॉर्मिंग गोष्ठी का आयोजन किया गया, जिसके मुख्य अतिथि, डॉ. पी.के. सेठ मुख्य अधिशासी, बायोटेक पार्क, लखनऊ थे।
- संस्थान के निदेशक डॉ. ओ.के. सिन्हा ने अपने स्वागत भाषण में कहा कि चीनी उद्योग को बहुत जल्द बायो इथेनाल और बायो ऊर्जा पर विचार करना पड़ेगा जिसके लिए चुकंदर जैसे अतिरिक्त सह फसल के बारे में सोचना चाहिए।
- उद्घाटन सत्र में डॉ. राममूर्ति सिंह, श्री के.पी. सिंह, डॉ. बक्शी राम, डॉ. नरेन्द्र मोहन, डॉ. एम.सी. दिवाकर तथा अन्य लोगों ने व्याख्यान दिया।
- संस्थान की प्रधान वैज्ञानिक, डॉ. पुष्पा सिंह ने अपना मुख्य व्याख्यान “इथेनाल प्रोडक्शन, एमरजिंग टेक्नोलॉजी एण्ड सस्टेनेबिलिटी इश्यूज” पर दिया।



Group Meeting of AICRP on Sugarcane Organized

The Group Meeting of All India Coordinated Research Project on Sugarcane was hosted by the Rajendra Agricultural University, Pusa (Bihar) on December 15-16, 2015. The Opening Session was held under the Chairmanship of Dr. J.S. Sandhu, DDG (CS), ICAR, New Delhi. On this occasion, Dr. A.K.P. Singh, Vice-Chancellor, RAU, Pusa was the Chief Guest. Dr. J.P. Upadhyay, Director of Research, RAU, Pusa welcomed the participants. Dr. O.K. Sinha, Project Coordinator (Sugarcane) presented the annual progress report of AICRP on Sugarcane for the year 2014-15. Dr. Bakshi Ram, Director, ICAR-SBI, Coimbatore, apprised about the increasing area under the variety Co 0238 in Uttar Pradesh, Haryana and Punjab.

Dr. A.D. Pathak, Director, ICAR-IISR, Lucknow briefly narrated the global production of sugarcane and sugar. He mentioned that sugarcane is now becoming a preferred crop not only for sugar production, but also for bio-fuel, green energy and other by-products like bio-plastics, bio-polymers etc. Bio-ethanol from sugarcane juice, bagasse and cellulosic material could meet out the increasing requirement of ethanol for blending in petrol. Dr. A.K.P. Singh, Vice-Chancellor, RAU, Pusa, in his inaugural address, focused on the sugarcane research and development programme in Bihar and constraints in sugarcane cultivation.

Dr. J.S. Sandhu remarked that climate change is becoming a serious problem in most of the crops. He laid emphasis on developing sugarcane varieties tolerant to climatic change and abiotic stresses, which can be accomplished by making more number of crosses in hybridization programme.

The concurrent technical sessions of Crop Improvement, Crop Production, Plant Pathology and Entomology were held to review the annual progress of research work and formulation of technical programme for 2016-17.

- अखिल भारतीय गन्ना शोध समन्वय परियोजना की बैठक दिनांक 15–16 दिसम्बर, 2015 को राजेन्द्र कृषि विश्वविद्यालय, पूसा (बिहार) में की गई।
- बैठक में मध्य देर से तैयार होने वाली गन्ने की किस्म कोपू 06436, एस.आर.आई., पूसा द्वारा विकसित को संस्तुत की गई।
- गन्ने की फसल में उपोष्ण क्षेत्र हेतु एन.पी.के. की मात्रा के साथ जस्ता 5 कि.ग्रा./हे. और गंधक 40 कि.ग्रा./हे. की दर से प्रत्येक वर्ष छिड़काव एवं उष्ण क्षेत्र हेतु एन. पी.के. के मात्रा को साथ जस्ता 10 कि.ग्रा./हे. और गंधक 60 कि.ग्रा./हे. की दर से छिड़काव उपयोगी पाया गया।

Technologies developed

- **Development of varieties:** Variety CoP 06436 (midlate), developed by SRI, Pusa, was released and notified in 2015.
- **Response of sugarcane crop to different plant nutrients in varied agro-ecological situations.**
Application of Zn @ 5 kg/ha and S @ 40 kg/ha along with NPK every year to sugarcane plant crop was recommended for subtropics, while for tropics, the application rate of Zn and S was 10 and 60 kg/ha along with NPK, respectively.
- **Enhancing sugarcane productivity and profitability under wheat- sugarcane cropping system.**
Where moisture is not a limiting factor, intercropping of wheat (1:2 or 1:3) with sugarcane can be taken. Sugarcane in furrows and wheat on raised beds.
- **Priming of cane node for accelerating germination**
For Peninsular Zone where soil moisture does not

deplete rapidly, planting of primed cane node with cattle dung + cattle urine + water in 1:2:5 ratio may be used as planting material and for North West Zone, conventional planting of 3-bud setts may be continued.

- **Management of brown rust of sugarcane**

Two sprays of propineb (0.2%) or mancozeb 75 WP (0.3%) at 15 days intervals from the initiation of the symptoms were found effective against the disease. The cost benefit ratio analysis of different treatments indicated Mancozeb 75 WP @ 0.3% recorded the highest C:B ratio (1.02).

- **Management of mealy bugs in sugarcane**

Sett treatment with imidacloprid 70 WG/SP @ 25 g a.i./ha or thiamethoxam 70 WG/SP @ 25 g a.i./ha (36 gm product in 150 litres of water) followed by spraying of imidacloprid 17.8 SL @ 0.05% at cane formation effectively controls mealy bug of sugarcane.

IISR Entries accepted for multilocation testing

Following entries were accepted for multi-location testing under AICRP (S) during its Annual Group Meeting held at RAU, Pusa on December 15-16, 2015:

North Central Zone

Early : CoLk 15466, CoLk 15467
Mid-late : CoLk 15468, CoLk 16469

North Western Zone

Early : CoLk 15201, CoLk 15202, CoLk 15203, CoLk 15204 and CoLk 15205
Mid-late : CoLk 15206, CoLk 15207, CoLk 15208, CoLk 15209

STEP FORWARD FOR THE WELL-BEING OF SUGARCANE & SUGAR SECTOR

Implementation of innovative scheme “Mera Gaon Mera Gaurav”

“Mera Gaon Mera Gaurav”, an innovative scheme of ICAR is being implemented by the groups of scientists of ICAR-IISR, Lucknow. The Institute constituted 13 multidisciplinary teams (each of four scientists) to promote the direct interface of the scientists with the farmers to hasten lab to land process. The team of scientists selected 63 villages in five districts of Uttar Pradesh viz., Sitapur (38), Faizabad (10), Raebareli (5), Barabanki (5) and Hardoi (5). Based on baseline survey in the selected villages, the problems of the farmers to be addressed were prioritised. The scientists offer farm advisory services in agriculture and other allied areas by paying their visits to home and fields of the farmers. The mobile user farmers have also been identified for making delivery of farm advisory more rapidly in case of immediate concern among the farmers in

selected villages. The team of scientists collected soil samples at farmers' fields for analysis in the institute laboratory. A total 310 Soils health cards with specific recommendations have been provided to the farmers so far.

- ‘मेरा गांव मेरा गौरव’ कार्यक्रम के तहत संस्थान ने विभिन्न विषयों के वैज्ञानिकों की 13 टीम बनायी है। प्रत्येक दल में 4 वैज्ञानिक हैं।
- इसके अंतर्गत 5 जिलों (सीतापुर, फैजाबाद, रायबरेली, बाराबंकी, हरदोई) के 63 गांवों को चयनित किया गया है।
- विभिन्न गांवों से 310 किसानों के खेत का मृदा नमूना इकट्ठा करके उनका ‘मृदा स्वास्थ्य कार्ड’ बनाया गया। उस कार्ड के आधार पर अनुशंसा करके उन्हें किसानों को दिया गया।
- चयनित गांवों में संस्थान के वैज्ञानिक किसानों के खेतों पर जाकर उनकी फसल को देखते हैं एवं कृषि से जुड़ी समस्याओं पर चर्चा करके उन्हें सलाह देते हैं।



Entrepreneurship in Jaggery

The infrastructure for promoting entrepreneurship in jaggery production will be created in IISR Regional Centre, Motipur. This was announced by Sh. Radha Mohan Singh, Hon'ble Minister of Agriculture and Farmers Welfare, Government of India during his visit to IISR Regional Centre, Motipur (Bihar) on December 27, 2015. The Minister reviewed the research and developmental works done at the centre and showed keen interest in various R & D activities. He also announced a financial aid of Rs. 2.5 crore for establishing a jaggery production unit and farmers training facility in the centre for promotion of entrepreneurship in jaggery making and cane seed production. A Scientists-farmers interaction meet was also organized as part of *Jai Kisan Jai Vigyan* celebration on December 27, 2015 in which more than 500 farmers of the region participated.

- श्री राधा मोहन सिंह जी, माननीय केन्द्रीय कृषि एवं किसान कल्याण मंत्री, भारत सरकार ने संस्थान के क्षेत्रीय केन्द्र, मोतीपुर, बिहार का दिनांक 27 दिसम्बर, 2015 को भ्रमण किया तथा गुड़ उत्पादन इकाई एवं किसान प्रशिक्षण केन्द्र हेतु 2.5 करोड़ रु. की वित्तीय सहायता प्रदान करने की घोषण की।
- संस्थान के क्षेत्रीय केन्द्र, मोतीपुर (बिहार) में 'जय किसान जय विज्ञान' कार्यक्रम का आयोजन दिनांक 27 दिसम्बर 2015 को किया गया जिसमें आसपास के क्षेत्रों से लगभग 500 किसानों ने भाग लिया।



Pre-Kharif Kisan Sammelan organized

Pre Kharif Kisan Sammelan was organized by Krishi Vigyan Kendra, ICAR-IISR, Lucknow on July 11, 2015 with the objective to create awareness among the farmers on latest technologies developed by various research institutions/agricultural universities and acquainting them about impact of climate change on the various crops. Technology showcasing, technical sessions, award to innovative farmers and farmers-scientists interaction were the major component of the programme. The programme was inaugurated by Shri Kaushal Kishore, Hon'ble Member of Parliament, Mohanlalganj and presided over by Dr. O.K. Sinha, Director, IISR, Lucknow. Dr. U.S. Gautam, Zonal Project Director, Zone-IV, Kanpur, Dr. M.C. Diwaker, Director, Directorate of Sugarcane Development, Ministry of Agriculture, Govt. of India and



Dr. S. Rajan, Director, Central Institute of Sub-tropical Horticulture, Lucknow were Special Guests in the programme. Dr. O K Sinha, Director, ICAR-IISR in his welcome address highlighted technology developed by the

Institute and urged farmers for their adoption. Sh. Kausal Kishore, Hon'ble Member of Parliament gave valuable remarks on organic farming, concept of *swadeshi* in agriculture, conservation of eco-diversity and quality seed production.

विश्व मृदा स्वास्थ्य दिवस का आयोजन

भारत सरकार की महत्वाकांक्षी 'राष्ट्रीय मृदा स्वास्थ्य कार्ड' योजना के अन्तर्गत दिनांक 05 दिसम्बर, 2015 को विश्व मृदा स्वास्थ्य दिवस का आयोजन भारतीय गन्ना अनुसंधान संस्थान, लखनऊ में किया गया। इस अवसर पर प्रदेश के विभिन्न जनपदों के 300 किसानों को मृदा स्वास्थ्य कार्ड वितरित किए गए। आयोजन समारोह पर मुख्य अतिथि, डा. के. एन. तिवारी, पूर्व प्राध्यापक एवं अध्यक्ष, मृदा विभाग, चन्द्रशेखर आजाद कृषि एवं प्रौद्योगिकी विश्वविद्यालय, कानपुर ने मृदा स्वास्थ्य कार्ड किसानों को वितरित किए। संस्थान के निदेशक, डा. ए.डी. पाठक ने कार्यक्रम की अध्यक्षता करते हुए कहा कि मिट्टी सदियों से बिना आराम किए सतत

अपनी उर्वरा गुण फसल को प्रदान करते हुए मानव समुदाय के लिए अन्न तथा अन्य खाद्य पदार्थों का उत्पादन करती रही है। मानव अपने स्वार्थ के लिए मिट्टी का दोहन सैकड़ों वर्षों से करते आया है जिस कारण आज हमारी मिट्टी बीमार हो गई है। अब समय आ गया है कि हम मृदा की खराब होती उर्वरा एवं स्वास्थ्य पर गंभीर हो जाएं तथा इसमें सुधार के लिए आवश्यक उपाय किए जायें। मिट्टी जाँच कराने की आवश्यकता तथा मिट्टी में उपलब्ध पोषक तत्वों के आधार पर फसल का चुनाव करना एवं उर्वरकों के प्रयोग करने की महत्ता पर तकनीकी जानकारी कृषकों को डा. टी.के. श्रीवास्तव, प्रधान वैज्ञानिक द्वारा दी गई। संस्थान में प्रसार एवं प्रशिक्षण प्रभारी, डा. ए.के. साह ने कार्यक्रम पर विस्तृत जानकारी से आगंतुकों को अवगत कराया।



Chilo tumidicostalis- Pest of sugarcane

Plassey borer, *Chilo tumidicostalis* Hampson is one of the important regional pests of sugarcane in Bihar. The pest survey conducted in July 2015 at IISR, RC, Motipur (Muzaffarpur) showed that the incidence of borer was 16.25 and 6.42% in SA-04-245 (ISH & IGH lines) and Co 0233, respectively. The ravages of the pest start with the second brood during July-August, when nodes are formed. The larvae usually prefer the upper 4 to 5 soft nodes of the cane. About 89 larvae were found in 2-3 internodes of few cane in SA-04-245, while in majority of canes, 2-7 larvae and 2-3 per cane were observed. Up to 5 pupae were observed in

single node. The larvae destroy the intermodal tissue and make the cane hollow. In severe infestation (as seen in SA-04-245), the deep incisions in the tissues just below the rind were seen. As many as 5-7 holes are frequently observed in one internode. Top leaves of the canes were either dried or drying. The elongated sett roots were also observed on damaged internodes and made the net like cover around the cane.

Larval parasitisation by *Cotesia flavipes*, *Stenobracon deesae* and unknown parasitoid was 9.8, 3.6 and 2.1%, respectively. The activity of parasitoids was maximum in July as were seen in the cane fields.



Plassey borer affected cane



Gregarious phase of Plassey borer

INSTITUTE HIGHLIGHTS

QRT Meeting Organized

First meeting of QRT, constituted to review the research work done by ICAR- Indian Institute of Sugarcane Research, Lucknow; AICRP on Sugarcane and Krishi Vigyan Kendra, IISR, Lucknow for the period of 2010-2014, was held on December 7-8, 2015 in the Institute under the chairmanship of Dr. J.B. Chaudhary, Ex. Vice-Chancellor, G.B. Pant University of Agriculture and Technology, Pantnagar. Dr. N. Vijayan Nair, Ex. Director, SBI, Coimbatore; Dr. D.C. Upreti, Ex. National Fellow,

IARI, New Delhi; Dr. Menhi Lal, Ex. Head, IISR, Lucknow; Dr. Bacchan Singh, Ex. Professor (Agril. Engineering), GBPUA&T, Pantnagar; Dr. Satyavir, Ex. Dean (Agriculture), CCSHAU, Hisar and Dr. R.K. Samantha, Ex. Director, NAARM, Hyderabad were the other members of QRT present in the meeting. The meeting was attended by Dr. A.D. Pathak, Director, Dr. P.K. Singh, Member Secretary and all the scientists of the IISR, Lucknow. All the Heads of the Divisions, PC (Sugarcane) and Incharges of Sections/Units made the presentation of respective divisional/sectional achievements before QRT.



QRT for SBI, Coimbatore visited IISR

QRT Team of ICAR-Sugarcane Breeding Institute, Coimbatore under the chairmanship of Dr. B. Mishra, Ex. Vice Chancellor, SKUAS&T, J & K, & Ex. Director, Directorate of Wheat Research, Karnal along with other members visited the Institute on October 28, 2015. The QRT team discussed with the scientists of the Institute and identified major areas of collaborative research programmes between SBI, Coimbatore and IISR, Lucknow.



XXI Meeting of RAC organized

XXI meeting of Research Advisory Committee (RAC) of the ICAR-Indian Institute of Sugarcane Research, Lucknow for the year 2015 was held on July 07-08, 2015

under the chairmanship of Dr. A.N. Mukhopadhyay, Ex. Vice-Chancellor, AAU, Jorhat. The meeting was attended by all the RAC members *viz.*, Dr. N. Balasundaram, Dr. D.G. Hapase, Dr. A.S. Patil, Dr. Surendra Singh, Shri J.L. Jain, Dr. O.K. Sinha, Sh. K.P.S. Rathi, Sh. S.K. Rana, and Dr. S.N. Singh, Member-Secretary. The following recommendations were made by the Committee:

- In order to reduce cost of cultivation and improve soil health, technology needs to be developed for multi ratooning with intensive use of biofertilizers, enhancing soil carbon content through organic sources and increasing water-use efficiency. A threshold for soil organic carbon content may be determined to ensure remunerative sugarcane production.
- The technology of increasing cane yield through GA₃ application should be tested at several locations, both in tropics and sub-tropics.
- Deep furrow sugarcane planter should be supplemented with seeder and liquid biofertilizer dispenser. This planter with wide row spacing (150 cm) should be demonstrated in tropical locations.
- There is a need to develop low cost agricultural machineries for small farms.
- For developing high biomass energy canes, *Erianthus* clones may be directly evaluated as a short term measure. Besides, development of clones with high sugar and relatively higher fibre content (13-15%) may also be undertaken for yielding more bagasse for co-

generation purpose.

- Models may be developed for forecasting sugar recovery in mills on the basis of environmental conditions, varietal composition and performance of the crop in a location. Similar efforts may be done for forecasting cane yield.
- In bio-fertilizer production programme, *Trichoderma* sp. must be included in the microbial consortium. The effect of seed cane (sett) priming with *Trichoderma* sp., may also be studied on cane and sugar yield.
- Production of good quality seed cane of

recommended varieties should be taken up on a large scale involving sugar mills.

- White grub has become a serious insect-pest at several locations including western U.P. *Beauveria brongniartii* may be used for its biocontrol. There is a need to increase number of biocontrol laboratories in the country for mass multiplication of bioagents. IISR may take a lead involving sugar mills.
- Sugarbeet may be exploited for bioethanol production.



IRC Meeting

The IRC meeting was held on October 13-15, 2015 under the chairmanship of Dr. T.K. Srivastava, Director, IISR. During three days of deliberations in the meeting, 54 institute research projects were reviewed, five new project proposals were approved, and six research projects were concluded.

XXXIX Meeting of IMC Organized

Thirty ninth meeting of Institute Management Committee was held on December 5, 2015 under the chairmanship of Dr. A.D. Pathak, Director. Progress of R & D efforts was reviewed and various administrative matters were discussed.

Institute Technology Management Committee Meeting Organized

The meeting of Institute Technology Management Committee was held on November 16, 2015 under the chairmanship of Dr. T.K. Srivastava, Director. Three technologies identified in IRC Meeting were discussed in length and breadth for commercialization. Interface Meeting with Industry was also organized in which, an industrial representative gave positive feedback on the potential of sugarcane machineries developed by the Institute, particularly in Uttar Pradesh. He also emphasized for the need of subsidies to promote the mechanization of sugarcane cultivation.

Workshop on Natural Farming and Cow-based Economy

National Workshop of *Unnat Bharat Abhiyan* on **Natural Farming and Cow-based Economy** was organised by ICAR- Indian Institute of Sugarcane Research, Lucknow

during December 12-13, 2015. The Workshop was inaugurated by Dr. Sanjeev Kumar Balyan, Minister of State for Agriculture and Farmers Welfare, Govt. of India on December 12, 2015. In his inaugural address, Dr. Balyan emphasised on the need to change present agricultural education system to make it more oriented towards practical & natural farming, so that students can become agri-preneurs after completion of their degree. The inaugural session was presided over by Dr. N. S. Rathore, DDG (Agricultural Education), ICAR, New Delhi. Dr. Rathore informed that, to implement programme related to Agriculture, Animal husbandry and Forestry, ICAR is a nodal agency under *Unnat Bharat Abhiyan* (UBA). Dr. A.D. Pathak, Director, ICAR-IISR, Lucknow welcomed the guests & delegates and briefed on objectives of workshop. Dr. M.B. Chetty, ADG (Agricultural Education), ICAR attended the inaugural session. Sant Shri Kanisidheshwar Ji Maharaj from Kaneri Math, Kolhapur, Maharashtra emphasised on developing smart village in place of smart city. He also presented model of *Aadarsh Gram* implemented by him in Shelkebadi village in Maharashtra. Shri Hridayanath Singh, Patron of *Lok Bharti* addressed delegates in the inaugural function.

In the valedictory session of the workshop held on December 13, 2015, Shri Yogi Adityanath Ji, Hon'ble Member of Parliament, Gorakhpur (Uttar Pradesh) was the Chief Guest. In his speech, Shri Yogi Ji said that self dependency can only be achieved by self sufficiency and that must come indigenously. The Member of Parliament from Shahjahanpur (Uttar Pradesh), Smt. Krishna Raj Ji was the Guest of Honour in the valedictory function.

In technical sessions, more than 40 presentation were made

by participating delegates. Professors from IIT, Delhi, Scientists of IISR, officials and members of *Lok Bharti*

(NGO) and more than 250 progressive and experimenting farmers from different states of the country participated in the workshop.



- संस्थान में उन्नत भारत अभियान के अंतर्गत “प्राकृतिक खेती और गौ आधारित अर्थव्यवस्था” विषय पर दिनांक 12–13 दिसम्बर, 2015 को एक राष्ट्रीय कार्यशाला का आयोजन किया गया।
- इस कार्यक्रम का उदघाटन डॉ. संजीव कुमार बाल्यान, केन्द्रीय कृषि एवं किसान कल्याण राज्य मंत्री, भारत सरकार ने दिनांक 12 दिसम्बर, 2015 को किया। इस अवसर पर उन्होंने कहा कि कृषि शिक्षा पद्धति को अब बदलने की जरूरत है तथा इसे प्रायोगिक और प्राकृतिक आधारित बनाने की जरूरत है।
- इस बैठक में भा.कृ.अनु.प., नई दिल्ली के उपमहानिदेशक (कृषि शिक्षा), डॉ. एन.एस. राठौर ने बताया कि भारत सरकार द्वारा चलाई जा रही कृषि आधारित कार्यक्रम में भा.कृ.अनु.प., नई दिल्ली नोडल एजेंसी के रूप में कार्य कर रहा है।
- इस कार्यक्रम के समापन समारोह में मुख्य अतिथि के रूप में श्री योगी आदित्यनाथ जी, माननीय सांसद, गोरखपुर (उत्तर प्रदेश) एवं विशिष्ट अतिथि, श्रीमती कृष्णा राज, माननीय सांसद, शाहजहांपुर (उत्तर प्रदेश) थी।
- तकनीक सत्रों में देश के विभिन्न हिस्सों से आये प्रगतिशील किसान, आई.आई.टी., दिल्ली के प्रोफेसर, संस्थान के वैज्ञानिक एवं लोक भारती (एन.जी.ओ.) के सदस्यों ने भाग लिया। इस दौरान 40 प्रस्तुतिकरण किए गए।

World Food Day celebrated

World Food Day was celebrated at the Institute on October 16, 2015 and Dr. S. Solomon Ex. Director of the Institute was the Chief Guest at the occasion. Improved production

technology was demonstrated to the farmers of adjoining districts. *Ganna Taknik Pradarshani Evam Krishak Goshthi* and Seed Production Awareness Programme was organized on this occasion in which more than 300 farmers participated.



- संस्थान में दिनांक 16 अक्टूबर 2015 को विश्व खाद्य दिवस मनाया गया जिसके मुख्य अतिथि, संस्थान के पूर्व निदेशक, डॉ. एस. सोलोमन थे। इस अवसर पर गन्ना तकनीकी सत्र एवं कृषक संगोष्ठी का भी आयोजन किया गया जिसमें 300 किसानों ने भाग लिया। इसमें संस्थान द्वारा विकसित तकनीकों को बताया गया।

Jai Kisan Jai Vigyan Week Celebrated

Jai Kisan Jai Vigyan Week was celebrated from December 23-29, 2015 under which teams of the scientists visited villages adopted under *Mera Gaon Mera Gaurav* Scheme. The programme was concluded on December 29, 2015 in

which farmers from nearby districts shared their success stories with fellow farmers and were felicitated. The team leaders of each team of MGMG made the presentation of their visits and activities in the adopted villages.

TRANSFER OF TECHNOLOGY

Seed Cane Production

For fast spread of newly released cane varieties, seed cane production technology was demonstrated on farmers' fields in the command area of Biswan Sugar Mill, Sitapur and seed cane crop of varieties CoLk 94184, CoLk 9709, CoPk 05191, Co 05011, CoH 128, Co 0118 and Co 0238 was raised in 8.0 ha area. Seed cane crop of demonstrated varieties was raised in total of 30 seed plots covering six villages. A Scientist-farmers interaction meet was also organised to create awareness among farmers in seed cane production technology.

गन्ने की संस्तुत नवीन किस्मों के स्वस्थ बीज गन्ना उत्पादन के लिए कोलख 94184, कोलख 9709, को.पीके. 05191, को. 05011, को. 0118, को. 0238 तथा को.ह. 128 किस्मों पर किसानों के खेतों तथा चीनी मिल प्रक्षेत्र पर प्रदर्शन आयोजित किया गया। बीज गन्ना उत्पादन के लिए कृषकों में जागरूकता लाने के लिए वैज्ञानिक-कृषक परिचर्चा का आयोजन किया गया।

Entrepreneurship Training conducted

To develop entrepreneurial ability of cane growers in cane seed production, multiplication and marketing, entrepreneurship trainings were organised in the months of October and December, 2015 at Manpur farm of Biswan sugar mill in Sitapur district of Uttar Pradesh. To promote agri-preneur among Agriculture Graduates, entrepreneurship training sponsored by Agri Clinic and Agri Business Centre, Lucknow was conducted on September 15, 2015 and November 21, 2015 in which a total of 60 trainees participated. In order to inculcate entrepreneurial behaviour among farmers in crop husbandry, one day training sponsored by Indira Gandhi Institute of Cooperative Management, Lucknow was conducted on October 28, 2015 for 20 farmers.

बीज गन्ना उत्पादन, सम्बर्धन, विपणन में किसानों की उद्यमिता क्षमता विकास के लिए बिसवाँ चीनी मिल क्षेत्र के किसानों के लिए अक्टूबर तथा दिसम्बर महीने में उद्यमिता विकास प्रशिक्षण आयोजित किया गया।

Demonstration on Intercropping with sugarcane

To promote the adoption of intercropping with autumn sugarcane in Uttar Pradesh 12 demonstrations was conducted in farmers' fields in command area of Biswan Sugar Mill, Biswan, Sitapur covering 6.0 ha area. Lentil, pea, mustard, wheat and red gram were cultivated with autumn planted cane as intercrops with recommended packages of practices.

Under Centrally sponsored NFSM scheme of Ministry of Agriculture and Farmers Welfare, Govt. of India (2015-16), a total of 40 demonstrations on Breeder Seed Production and 20 demonstrations on intercropping (each of one ha) was conducted at farmers' fields.

- बिसवाँ चीनी मिल, सीतापुर के अन्तर्गत 6 हेक्टेयर क्षेत्र में किसानों के खेत में शरदकालीन गन्ने के साथ अन्तः फसल का 12 प्रदर्शन आयोजित किए गया। जिसमें गन्ने की फसल में चना, मटर, सरसों, गेहूँ और मसूर को लगाने की संस्तुति की गई।
- केन्द्र सरकार के कृषि एवं किसान कल्याण मंत्रालय द्वारा संचालित एनएफएसएम परियोजना के अन्तर्गत प्रजनक बीज उत्पादन पर 40 प्रदर्शन और अन्तःफसल खेती पर 20 प्रदर्शन किसानों के खेतों पर आयोजित किए गए।

Showcasing of Sugarcane Technology

Sugarcane production technologies were showcased in the Agri-Exhibition organised during *Jai Kisan Jai Vigyan* Programme organised at Motihari, Bihar on December 25, 2015. Hon'ble Union Minister of Agriculture and Farmers' Welfare, Govt. of India, Shri Radha Mohan Singh Ji inaugurated the Exhibition. Hon'ble Minister visited IISR stall and interacted with scientists. The new sugarcane varieties, machines and cane production technology were showcased through display of live materials, exhibits and models in Agri-Expo organised at Pipra Kothi, East Champaran, Bihar on August 20-21, 2015. Hon'ble Union Minister of Agriculture and Farmers' Welfare, Govt. of India, Shri Radha Mohan Singh Ji, DG, DDGs from ICAR, Directors of ICAR Institutes, scientists, representatives of agri-input agencies, entrepreneurs and about 3000 farmers visited IISR stall.



- मोतिहारी, बिहार में दिनांक 25 दिसम्बर, 2015 को जय किसान— जय विज्ञान कार्यक्रम के उपलक्ष्य पर आयोजित कृषि मेला में संस्थान द्वारा गन्ना उत्पादन तकनीकों पर प्रदर्शन स्टाल लगाया गया।
- दिनांक 20–21 अगस्त, 2015 को पिपराकोठी, पूर्वी चम्पारण, बिहार में आयोजित एग्री— एक्सपो में गन्ना की नई किस्मों, मशीनों तथा अन्य उत्पादन तकनीकों पर प्रदर्शनी आयोजित की गई।
- संस्थान द्वारा प्रदर्शित तकनीकों को लगभग 3000 से ज्यादा किसानों तथा विशिष्ट अतिथियों, वैज्ञानिकों व उद्यमियों ने देखा तथा सराहा।



Bihar farmers benefited from sugarcane information

In Technical session organised on August 21, 2015 during Agri – Expo held at Pipra Kothi, East Champaran, Bihar on August 21, 2015 Dr. A.K. Sah, Principal Scientist delivered lecture on sugarcane cultivation techniques for Bihar and more than 3000 farmers, cane development staff of Bihar attended the session. Dr. S. Ayyappan, DG, ICAR visited IISR RC, Motipur on August 20, 2015 and reviewed seed production programme being implemented by the centre and suggested to cover more number of sugar mills of Bihar under seed cane production programme.

- पिपरा कोठी, पूर्वी चम्पारण, बिहार में दिनांक 21 अगस्त, 2015 को एग्री—एक्सपो के अवसर पर किसानों के लिए आयोजित तकनीकी सत्र में बिहार राज्य के लिए गन्ना तकनीकों पर संस्थान के प्रधान वैज्ञानिक, डा. ए.के. साह ने व्याख्यान दिया।
- इस तकनीकी सत्र में बिहार के 3000 से अधिक किसानों तथा गन्ना विकास कार्यकर्ताओं ने दी गयी जानकारी का लाभ उठाया।

Model Training Course organized

Model Training Course on Advances in Sugarcane Agri-business Management Systems was organized at IISR, Lucknow from October 6-13, 2015. The training course was inaugurated by Dr. B.K. Yadav, Managing Director, UP Cooperative Sugar Federation, Lucknow on October 6, 2015. The Valedictory function was organized on October 13, 2015 in which Shri Virender Singh, Additional Commissioner, Directorate of Extension, Ministry of Agriculture and Farmers Welfare, Govt. of India was Guest of Honour.

Training organized for Sugar Mill Personnel

A fifteen days National training was organized for the sugar mill personnel during July 1-15, 2015. In this training, 16 cane officers of 14 sugar mills of North India participated. Knowledge in specialized areas like seed cane production and multiplication, varietal planning, harvesting schedule, plant population management, soil health management, biocontrol, integrated development strategy, ICT in sugarcane and climate resilient cane agriculture were imparted through theoretical and practical sessions.



- संस्थान द्वारा दिनांक 1–15 जुलाई 2015 को राष्ट्रीय प्रशिक्षण आयोजित किया गया जिसमें उत्तर भारत के 14 चीनी मिलों के 16 गन्ना अधिकारियों ने भाग लिया। गन्ने से संबंधित विभिन्न विषयों जैसे गन्ना बीज उत्पादन, किस्मों का चुनाव, गन्ना बुआई की योजना, मृदा स्वास्थ्य, जैव नियन्त्रण इत्यादि विषयों पर प्रायोगिक एवं सैद्धांतिक जानकारी दी गयी।

HUMAN RESOURCE DEVELOPMENT

Awareness programme on IP & TM was organized

Awareness programme on IP & TM was organized at IISR, Lucknow on November 16, 2015. Dr. Poonam Jayant Singh, IP Expert and Sr. Scientist, NBFGR, Lucknow delivered the lecture on IP Management.

NET/ARS-Preliminary 2015 Exam

Agricultural Scientist Recruitment Board (ASRB), New Delhi in search of talents for Agricultural Research Services regularly conducts various examinations all over India. It has now developed a network of Online Examination Centres at 23 places to ease the process of evaluating candidates in various disciplines of agricultural sciences. Recently, an online examination of NET/ARS-Preliminary 2015 was held at IISR, Lucknow centre. It was organized in three slots per day during December 4-10, 2015. Out of total 1768 candidates allotted to the centre in various disciplines, 1320 candidates appeared in examination at this centre.



Awards and Recognitions

- Dr. Amaresh Chandra (Principal Investigator), Principal Scientist & Head, Division of Plant Physiology and Biochemistry, Dr. Radha Jain (Associate), Principal Scientist and Dr. S. Solomon (Associate), former Director, IISR, Lucknow have been conferred **ICAR-Hari Om Ashram Trust Award 2012-13 for Crop & Horticulture Sciences** in the year 2015.
- Dr. S.P. Singh, Senior Scientist (Plant Physiology) received *Rajiv Gandhi Rashtriya Gyan Vigyan Maulik Pustak Lekhan Puraskar* for his book written in Hindi by the President of India at New Delhi on September 14, 2015.
- Dr. A.K. Sah received Best paper presentation award for the paper presented on "Knowledge convergence in extension for skill based agricultural development" during ISEE Golden Jubilee National Seminar on Strategy to Drive Skill based Agriculture Development for Sustainability and Rural Employability held at BHU, Varanasi on November 5-7, 2015.
- Dr Ishwar Singh was awarded with 'Young Scientist Award 2015' and 'Best Paper Presentation Award' in 2nd International Conference on Agriculture, Horticulture and Plant Sciences held at Shimla (HP), India from December 26-27, 2015.

- Dr. Rakesh Kumar Singh, SMS (Animal Science) received Best KVK Scientist Award at ISEE Golden Jubilee National Seminar on Strategy to Drive Skill based Agriculture Development forward for Sustainability and Rural Employability held at IAS, BHU, Varanasi on November 7, 2015

दशहरा मेला : 22 अक्टूबर 2015



स्वच्छ भारत अभियान : 02 अक्टूबर 2015



Distinguished visitors

- Sh. Radha Mohan Singh, Hon'ble Minister of Agriculture and Farmers Welfare, Govt. of India visited ICAR-IISR Regional Centre, Motipur on December 27, 2016.
- Dr. Sanjeev Kumar Balyan, Hon'ble Minister of State for Agriculture and Farmers Welfare, Govt. of India visited Institute on December 12, 2016.
- Sh. Yogi Aditya Nath and Smt. Krishna Raj, Hon'ble Members of Parliament visited Institute on December 13, 2016.
- Sh. S.K. Singh, Additional Secretary, DARE & Financial Advisor, ICAR visited the Institute on August 26, 2015.
- Sh. R. Rajagopal, IAS, Additional Secretary, DARE and Secretary, ICAR visited the Institute on September 19, 2015 and reviewed the Institute activities.



राजभाषा प्रकोष्ठ

- संस्थान की राजभाषा पत्रिका 'इक्षु' को 'क' क्षेत्र के लिए राजभाषा कीर्ति पुरस्कार (प्रथम पुरस्कार) माननीय राष्ट्रपति महोदय द्वारा विज्ञान भवन, नई दिल्ली में दिनांक 14 सितम्बर, 2015 को दिया गया।
- हिन्दी पखवाड़ा का आयोजन : संस्थान में दिनांक 01-14 सितम्बर, 2015 तक हिन्दी पखवाड़ा का आयोजन किया गया।
- हिन्दी कार्यशाला का आयोजन : संस्थान में हिन्दी कार्यशाला 2015 का आयोजन 23 सितम्बर, 2015 तथा 30 नवम्बर, 2015 को किया गया जिसमें 88 प्रशिक्षणार्थियों ने भाग लिया।
- नगर राजभाषा कार्यान्वयन समिति की बैठक का आयोजन : नगर राजभाषा कार्यान्वयन समिति (कार्यालय 3) की वर्ष 2015-16 की द्वितीय छमाही बैठक दिनांक 30 नवम्बर, 2015 को भारतीय गन्ना अनुसंधान संस्थान, लखनऊ में आयोजित की गई। बैठक की अध्यक्षता डॉ. टी.के. श्रीवास्तव ने की। इस नराकास में 59 सदस्य कार्यालय हैं। बैठक में सदस्य कार्यालयों को विभिन्न कार्यों हेतु पुरस्कृत किया गया।



UPCOMING EVENT

National Training on Sugarcane Management & Development (July 1-15, 2016)

With the objective to groom and train the cane development personnel of sugar mills in latest technology of sugarcane cultivation and development, IISR will organise a 15 days National training from July 1-15, 2016

Training fee and tariff : ₹ 10,000 per participant.

Lodging and Boarding fee : ₹ 450 (Non-AC) & ₹ 550 (AC) per day per participant (on twin sharing basis) in addition to training fee.

Nomination: The nomination for cane development staff from sugar mill should reach to the Director, ICAR-IISR, Lucknow by June 15, 2016 along with requisite training fee (i.e. ₹ 10,000). Since the seats are limited, the officers will be selected on first-come, first-serve basis.

Contact:

Director or Dr. A.K. Sah, Principal Scientist & Incharge, Extension and Training, ICAR-IISR, Lucknow

Email: iisrlko@sancharnet.in, ajay_kumar29@rediffmail.com, ajaysahiisr@gmail.com

प्रकाशक — डॉ. ए.डी. पाठक, निदेशक

सम्पादक — डॉ. ए.के. साह, प्रधान वैज्ञानिक

श्री ब्रह्म प्रकाश, मुख्य तकनीकी अधिकारी

श्री अभिषेक कुमार सिंह, तकनीकी अधिकारी (राजभाषा)

भाकृअनुप—भारतीय गन्ना अनुसंधान संस्थान

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