

**April - June
2019**



NEWSLETTER

NATIONAL SUGAR INSTITUTE
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Sugar season 2018-19 is all set for all time high sugar production of about 33 million metric tonnes pushing further pressures on the sugar factories. With an expected sugar exports of 3.3 million tonnes during the year and considering domestic consumption to the extent of 26 million tonnes, the carryovers for the next sugar season shall be enormously high of the order of about 14.6 million metric tonnes. Thanks to the minimum support prices for sugar and ethanol policy, the sugar prices are stable although may not be lucrative.

The next sugar season 2019-20 to open with new challenges and opportunities. With the trend of sugar prices in the domestic market, economics being in favour of ethanol production, diversion of higher quantities of B heavy molasses is expected and which is required also. Keeping in view large number of ethanol units coming up and cyclic nature of Indian Sugar Industry, it is important to develop alternate feed stocks for ethanol production rather than banking upon molasses alone.

The sugar factories have to take a step forward for adopting innovative technologies for reducing cost of production of sugar and also for producing value added products so as to reduce their dependency on sugar revenues.

Narendra Mohan
(Director)

ANNUAL CONVENTION ORGANIZED:

4th Annual Convention of North Indian Sugarcane & Sugar Technologists' Association (NISSTA) was organized at NSI, Kanpur on 29-30th May 2019. It concluded with presentations on innovative technologies, value added products, energy & water conservation etc. 06 nos. of informative presentations were made by the institute experts on innovative processes and technologies.



Eminent experts, Prof. Ross Broadfoot, Sugar Research Institute, Australia, Mr. Ahmed Vawda, Plant Executive Director (Sugar), Saudi Arabia and Dr. Keerthipala, Director, Sugarcane Research Institute, Sri Lanka delivered lectures on important aspects of sugar processing & sugarcane price fixation mechanism.

WORKSHOP ORGANIZED:

National Sugar Institute, Kanpur jointly with Bharatiya Sugar organized two days workshop at Kolhapur on 03-04th May, 2019 on technical issues relating to productivity enhancement in distilleries & use of alternate feed stocks. Matters relating to effluent treatment to achieve ZLD through various modes were also discussed.



OUR FELICITATIONS:

1. Director, National Sugar Institute was conferred with **"Innovative Leader of Asia Award-2019"** during the 3rd Asian Leadership Summit being organized at Thimphu, Bhutan from 18 -22nd June 2019.



2. Director, National Sugar Institute conferred with **'Outstanding Academic Leader of the Year 2019'** award by Centre for Education Growth & Research for institute's contribution in education, skill and research.



3. Dr. V.P. Srivastava, Asstt. Prof. Organic Chemistry conferred with **"Young Scientist Award"** during the 4th Annual Convention of North Indian Sugarcane & Sugar Technologists' Association (NISSTA) organized at NSI, Kanpur on 29-30th May, 2019



4. Prof. Narendra Mohan, Director, National Sugar Institute was conferred with **"Life Time Achievement Award"** during the 4th Annual Convention of North Indian Sugarcane & Sugar Technologists' Association (NISSTA) organized at NSI, Kanpur on 29-30th May, 2019

INTERACTIVE SESSION ORGANIZED:

An interactive session for 20 IAS Probationers was organized at the institute on 28th June, 2019. During the session a presentation was given on **"Issues related to sugarcane production, milling, marketing management, cost and sugar recovery"**.



The probationers also visited various laboratories including Bureau of Sugar Standard to know process of preparation of sugar standard grades.

EXECUTIVE DEVELOPMENT PROGRAMME:

Three days **"Executive Development Programme"** was organized at the institute from 26-28th June, 2019. Senior officials from sugar factories & distilleries situated in UP, Bihar, Maharashtra, Karnataka, Gujarat and Haryana participated in the programme.



Lectures on sugar policy, human resource, value addition, sugarcane & sugar productivity and on environmental issues were delivered by faculty from institute and other reputed institutes viz. IIT & IISR etc.

RESEARCH:

1. Utilization of potash rich ash for production of valuable bio fertilizer- Boiler ash from Incineration Boilers installed in molasses based distilleries can be used as carrier for making bio-fertilizer. Data on field trial of urad was compiled and submitted as thesis by one scholar. Further studies on viability of prepared Bio fertilizers (Rhizobium; PSB & Azatobacter) with new bioferilizer was

done. Further, field trials will be taken up to test their efficacy on different crops.

2. Utilization of bagasse as dietary fiber- Studies on characteristics of bagasse as a food supplement were taken up. Different formulations were tried by incorporating bagasse fibre for bakery products and other traditional foods. Studies on shelf stability of all the value added products will be carried out by using suitable packaging materials.



3. Filter Cake to CNG – With an aim to utilize the filter cake for production of Bio-CNG, different combinations of filter cake, farm yard manure and spent wash were initially tried on laboratory scale & then a small pilot plant was developed. Initial steps for making pilot plant at hostel using agri and kitchen waste have been taken up.



At the same time isolation of 35 microflora was carried out using faeces material, cow saliva, cow dung, sludge etc. Purification is under process, once the inoculum is made ready, it will be tested for its efficacy on production of methane gas.

4. Studies on the feasibility of utilization of sugarcane bagasse as a potential feedstock to access cosmetic ingredients – The study aims at valorization of pentose sugars of bagasse. After validation of the character of the derived product to be used as cosmetic ingredient, the studies related to scale up the trials to validate the method along with the economics of the production are under process.

5. Studies on synthesis of glycosidic surfactants using by-product resources of sugar industry – Studies have been further taken up so as to enhance the yield of bagasse derived polypentosides based surfactant along with reduction in purification steps involved thereof. The material balance for the developed method based on 100 g scale to access the surfactant and related experimental works for characterization are in progress.



6. Studies on pot efficient synthesis of alkyl levulinates (Als) using sugarcane bagasse derived cellulose – This study has been taken up with an aim to isolate cellulose (to be used

as starting material) from bagasse, experiments have been carried out to fractionate hemicelluloses and lignin (three steps process). The characterization of these products via FT-IR has been completed. Now exploratory reaction is to be put from isolated compounds.



7. Mechanical clarification of juice – This research work has been taken up with a view to minimize use of chemicals for production of white sugar. Literature survey was carried out for further experiments on mechanical clarification to reduce the lime and sulphur consumption during sugar manufacturing process.

8. Use of brine reject in final molasses – Brine recovery and disposal of brine reject is an area of concern from environment angle in sugar refineries. Experiments were carried out to assess the effect of addition of brine reject in molasses with respect to its quality i.e. sugar content & fermentability etc.

9. Super short retention time clarifier – With an aim to reduce retention time in clarifier, modified design having inclined surfaces for mud settling has been developed. The initial results shows promise as the quality of clear juice obtained was found comparable or better than that from conventional clarifier. Further

trials will be carried out with some modifications in the existing design.

RESEARCH PAPERS:

1. **“Bioenergy from Filter Cake”** by Narendra Mohan presented during National Seminar jointly organized by SNSI & NSI on 12th April, 2019 at Belagavi, Karnataka.

2. **“Biomass Energy from Sugar Industry”** by Narendra Mohan & A.K. Kanaujia presented during National Seminar jointly organized by SNSI & NSI on 12th April, 2019 at Belagavi, Karnataka.

3. **“A Novel Multi-level SVPWM Scheme for High Power Induction Motor Drive Applications”** by Anoop Kumar Kanaujia, Sanjiv Kumar & D. Swain published in International Conference on Academic Science and Engineering (ICASAE – 2019) held on 7-8th June, 2019 at Lucknow.

4. **“Effect of Potassium Application on Nutrient Uptake, Yield and Quality of Sugarcane & Sustainable Soil Health”** by Ashok Kumar, Lokesh Babar, Narendra Mohan & Surinder Kumar Bansal sent for publication in Indian Journal of Fertilizers to be published in July, 2019.

5. **“Mechanical Clarification of Cane Juice with the Help of High Speed Centrifuge Machine”** by Mohit Kumar, Subhash Chandra, A.K. Garg & Narendra Mohan published in 4th Annual Convention of North Indian Sugarcane & Sugar Technologists’ Association (NISSTA) held on 29-30th May, 2019 at NSI, Kanpur.

6. **“Observation on Working of Super Short Retention Time Clarifier”** by M. Mandal & A.K. Shukla published in 4th Annual Convention of North Indian Sugarcane & Sugar Technologists’

Association (NISSTA) held on 29-30th May, 2019 at NSI, Kanpur.

7. **“Green Power, An Unexploited Potential in Indian Sugar Industry – A Review”** by Narendra Mohan & Anoop Kumar Kanaujia published in 4th Annual Convention of North Indian Sugarcane & Sugar Technologists’ Association (NISSTA) held on 29-30th May, 2019 at NSI, Kanpur.

8. **“A Novel Effluent Treatment Process for Plantation White Sugar Factories”** by Amresh Pratap Singh, Mahendra Yadav & Narendra Mohan published in 4th Annual Convention of North Indian Sugarcane & Sugar Technologists’ Association (NISSTA) held on 29-30th May, 2019 at NSI, Kanpur.

9. **“Real Time Monitoring for Efficient Water management”** by Brajesh Singh, Mahendra Pratap Singh & Virendra Kumar published in 4th Annual Convention of North Indian Sugarcane & Sugar Technologists’ Association (NISSTA) held on 29-30th May, 2019 at NSI, Kanpur.

10. **“Integrated Nutrient Management for Maximum Economic Yield of Sugar Beet and Sustainable Soil Health”** by Ashok Kumar, Lokesh Babar & Tej Pal Verma published in 4th Annual Convention of North Indian Sugarcane & Sugar Technologists’ Association (NISSTA) held on 29-30th May, 2019 at NSI, Kanpur.

11. **“Bio-Energy from Filter Cake”** by Sanjay Awasthi, Seema Paroha & Narendra Mohan sent for publication in the proceedings of 77th Annual Convention and International Sugar Expo of Sugar Technologists’ Association of India to be held on 17-19th July 2019 at Kolkata.

12. **“Utilization of Sugarcane Bagasse as Dietary Fibre”** by Neelam Chaturvedi, V. P.

Srivastava, Seema Paroha & Narendra Mohan sent for publication in the proceedings of 77th Annual Convention and International Sugar Expo of Sugar Technologists’ Association of India to be held on 17-19th July 2019 at Kolkata.

13. **“Moisture Reduction in Bagasse with Minimum Investment”** by Sanjay Chauhan & Narendra Mohan sent for publication in the proceedings of the 7th symposium of Bharatiya Sugar -2019 to be held at Kolhapur.

14. **“Cane Juice Centrifugation for Superior Quality Sugar”** by Mohit Kumar, Subhash Chandra, A.K. Garg & Narendra Mohan sent for publication in the proceedings of the 7th symposium of Bharatiya Sugar- 2019 to be held at Kolhapur.

15. **“Sugar and Other Value-based Products as per Market Requirement and Consumer Perception”** by Anushka Agarwal & Narendra Mohan, published in 4th Annual Convention of North Indian Sugarcane & Sugar Technologists’ Association (NISSTA) held on 29-30th May, 2019 at NSI, Kanpur.

16. **“Valorization of Sugarcane Bagasse Hydrolysate as a Potential Feedstock to access Cosmetic Ingredients”** by Narendra Mohan, V. P. Srivastava & Tushar Mishra, sent for publication in the proceedings of 77th Annual Convention and International Sugar Expo of Sugar Technologists’ Association of India to be held on 17-19th July 2019 at Kolkata.

17. **“A Review on Cane Preparation and Milling Efficiency”**, by D. Swain published in 77th Annual Convention and International Sugar Expo of Sugar Technologists’ Association

of India to be held on 17-19th July 2019 at Kolkata.

CONSULTANCY:

During April – June, 2019 consultancy services were provided to the following:

1.	M/s Ninaidevi Sakhar Karkhana, Distt - Sangli, Maharashtra.
2.	M/s Piccadily Agro Industries Ltd., Distt - Karnal, Haryana.
3.	M/s Meham Co-operative Sugar Mills Ltd., Meham, Distt - Rohtak, Haryana.
4.	M/s Bannari Amman Sugars Ltd., Distt - Coimbatore, Tamil Nadu.
5.	M/s Integrated Casetech Consultants Pvt. Ltd., Nodia, U.P.
6.	M/s Globus Spirits Ltd., Distt - Vaishali, Bihar.
7.	M/s DSCL Sugar, Hariawan, Distt - Hardoi, U.P.
8.	M/s MRN Cane Power (India) Ltd., Distt - Bagalkot, Karnataka.
9.	M/s U.P. State Sugar Co-operation, Unit - Mohiuddinpur, Distt - Meerut, U.P.
10.	M/s Dhampur Sugar Mills Ltd., Dhampur, Distt - Bijnor, U.P.
11.	M/s Dalmia Bharat Sugar Mills Ltd., Unit - Nigohi, Distt - Shahjahanpur, U.P.
12.	M/s Jamkhandi Sugars Ltd., Distt - Bagalkot, Karnataka.
13.	M/s B.K. Agrawal & Associates, Distt - Indore, M.P.
14.	M/s Simbhaoli Sugars Ltd., Unit - Chilwaria, Distt - Bahraich, U.P.
15.	M/s Sanjivani Sahakari Sakhar Karkhana Ltd., Goa.
16.	M/s The Kaithal Co-operative Sugar Mills Ltd., Distt - Kaithal, Haryana.

17.	M/s Palwal Coop. Sugar Mills Ltd., Palwal, Haryana.
18.	M/s Tikaula Sugar Mills Ltd., Distt - Muzaffarnagar, U.P.
19.	M/s Avadh Sugar & Energy Ltd., Unit - Seohara, Distt - Bijnor, U.P.
20.	M/s Mysore Sugar Company Ltd., Bangalore, Karnataka.
21.	M/s Uttam Sugar Mills Ltd., (Distillery Division), Barkatpur, Distt - Bijnor, U.P.

ANALYTICAL SERVICES:

Analytical services were rendered to following:

1.	M/s The Kisan Sahakari Chini Mills Ltd., Badaun, U.P.
2.	M/s Dalmia Bharat Sugar Mills Ltd., Unit - Nigohi, Distt - Shahjahanpur, U.P.
3.	M/s The Kisan Sahkari Chini Mills Ltd., Sathiaon, Distt - Azamgarh, U.P.
4.	M/s The Vellore Co-operative Sugar Mills Ltd., Katpadi, Distt - Vellore, Tamil Nadu.
5.	M/s D.S. 8 Subramaniya Siva Co-operative Sugar Mills Ltd., Gopalpuram, Tamil Nadu.

The samples of sugar, molasses, ethanol, waste waters & condensates etc. were analyzed for the desired parameters in the NSI-Analytical Laboratory (NABL Accredited).



OUR OTHER ACTIVITIES:

1. Director, National Sugar Institute, delivered a lecture on **“Sugar Quality Improvement”** for delegates from Indonesia at M/s Simbhaoli Sugars Ltd. on 13th April, 2019.



2. **“Earth Day”** was celebrated on 22nd April, 2019 in support for environmental protection at the institute. Tree plantation and oath taking for conserving natural resources and minimizing waste generation was done on this occasion.



3. NSI signed MoU with CSJM University, Kanpur to carryout collaborative research work on areas of mutual interest viz. bio-energy, bio-fuel, effluent treatment and also on exchange of faculty, conducting personality development programmes for students etc. The two organizations shall also take up study of

the environmental issues with other industries situated on the banks of holy river Gang.



4. Scientists of M/s Tata Chemicals Ltd. visited the institute to seek assistance on production of fortified sugars through co-crystallization technique.



5. **“Entrance Examination -2019”** for admission to various courses during academic season 2019-20 was conducted at six centers across the country on 09th June, 2019. Results of most of the courses were also declared.

6. **“World Environment Day”** was celebrated at the institute on 5th June 2019 on the theme **“Air Pollution”**. On this day, tree plantation was carried out in the institute colony. The newly constructed **“Children Park”** was handed over to the tiny-tots.



7. 52nd Advisory Board Meeting of the Institute was held on 07th June, 2019 under the Chairmanship of Joint Secretary (Sugar & Administration), Government of India.



The board while expressing satisfaction on the working of the institute, stressed for undertaking more collaborative research projects for developing technologies for value addition. **“Environment Science Laboratory”** was also inaugurated by Joint Secretary (S&SA).

8. Hon'ble State Minister Agriculture, Shri Ranvendra Pratap Singh inaugurated the Innovative **“Farmer's Meet”** at the institute organized by CII with NSI as Institutional partner on 18th June, 2019.



9. 300 KW Grid Connected Roof Top **“Solar Power Plant”** finally became operational at institute during the period.

सौर ऊर्जा से जगमगाया राष्ट्रीय शर्करा संस्थान



सौर ऊर्जा से जगमगाया राष्ट्रीय शर्करा संस्थान।
 फोटो : एसास्वी
 कानपुर (एसएसबी)। जीटी रोड पर कल्याणपुर स्थित राष्ट्रीय शर्करा संस्थान भूखण्ड को सौर ऊर्जा से जगमगाया जा रहा है। संस्थान में स्थापित 300 किलोवाट तक की शक्ति वाले सौर ऊर्जा संयंत्र का शुभारंभ निदेशक डॉ. नरेंद्र मोहन ने किया। सौर ऊर्जा का उपयोग किये जाने से संस्थान को प्रति वर्ष लगभग 20 लाख की बचत होगी।
 शर्करा संस्थान में सौर ऊर्जा संयंत्र में एम्प्लॉय चार तक टॉप सन प्रा. लि., नई दिल्ली द्वारा 'रेस्कॉ' मॉड में स्थापित किया गया है। अनुभव के साथ उच्च संदर्भ को केवल 2.3-9.1 प्रति सेंटीमीटर की दर से विद्युत उत्पादन का भूखण्ड किया जाएगा। संस्थान का परिवहन में लगभग 10 प्रति सेंटीमीटर की दर से विद्युत उत्पादन का भूखण्ड केवल की बचत पड़ता है। निदेशक नरेंद्र मोहन ने बताया कि प्रकृति में संस्थान परिवार में नवीकरणीय भवनों एवं होटल की छतों पर भी सौर ऊर्जा संयंत्र स्थापित करार क्षमता 500 किलोवाट तक किये जाने की योजना है।