



NEWSLETTER

July-September, 2019

Visit us at:
<http://www.nsi.gov.in>
Contact: nsikanpur@nic.in

**NATIONAL SUGAR INSTITUTE
KANPUR-208017(U.P.) INDIA**



Stability in the sugar prices and revision of ethanol rates has brought some relief to the Indian Sugar Industry. The news coming from Maharashtra and Eastern Uttar Pradesh indicates possible sugar production of the extent of 28 million tonnes during sugar season 2019-20.

The only word of caution will be the availability of molasses as it would be comparatively lesser than last year and because of the growing demand with more ethanol units coming up.

Alternate feed stocks for ethanol, production of sugar to meet domestic and global requirements and utilization of by products in innovative manner has to be explored for economic and environmental sustainability of the sugar industry. Alternate usage of bagasse, in particular, for production of niche products viz. dietary fibre, nano materials and surfactants to products like particle board facilitating bulk consumption are also required to be made after careful market studies.

Wishing you Happy Diwali and a successful crushing season 2019-20.

**Narendra Mohan
(Director)**

SEMINAR ORGANIZED/PARTICIPATED:

1. National Seminar on **"Indian Sugars-Standardization & Quality Considerations"** was jointly organized by NSI-BIS-Maarc Labs at the institute on 26th September, 2019 at NSI, Kanpur. Delegates from BIS, New Delhi, Maarc Labs., Pune & sugar industry as well as students of the institute participated in the seminar. Presentation were made on sugar standards prevalent in other countries & as accepted for global trade. Importance of food safety management was also emphasized during the seminar.



2. Director, NSI participated in National Seminar on **"Food Chemistry, Processed Food and Toxicology"** and delivered Presidential Address on "Quality aspects of Indian Sugars for global competitiveness" on 25th September, 2019 at Department of Chemistry, D.A.V., PG College Kanpur.



3. Director, National Sugar Institute delivered Mangal Singh Memorial Lecture on the topic **"Sugar Industry- As I look at it"** during the 77th Annual convention of STAI held on 17-19th July, 2019 at Biswa Bangla Convention Centre, New Town, Kolkata, W.B.

WORKSHOP ORGANIZED/ATTENDED:

1. A workshop on 5th September, 2019 on the topic **"Production of Particle Board from Bagasse"** was organized at National Sugar Institute, Kanpur. The workshop was aimed to discuss possible use of bagasse for production of particle board for manufacture of furnitures. An elaborate study was presented by M/s Protos Engineering Pvt. Ltd., Mumbai on relative cost-economics & quality.



2. Shri D. Swain, Prof. Sugar Engineering & Shri Anoop Kumar Kanaujia, Asstt. Prof. Sugar Engineering attended the National Conference on **"Sugar Tech - 2019"** organized by Confederation of Industry (CII) at Lucknow on 19th September, 2019. The institute participated as **"Knowledge Partner"** in the conference.

3. Director, National Sugar Institute attended **"Bharatiya Sugar Symposium"** on 20-21st September, 2019 at Kolhapur on the topic of "Sustainability of Sugar Industry". He also

addressed the delegates on **“Economics & Environmental Sustainability of the Sugar Industry”**.



TRAINING PROGRAMME ORGANIZED:

Three days training programme on **“Validation & Efficient Operation of Effluent Treatment Plants (Sugar)”** conducted at the institute from 11-13th September, 2019. Training on theoretical & practical aspects of effluent management was imparted to the participants.



Dr. Sushil Solomon, Vice Chancellor, CSA University of Agriculture & Technology graced the occasion and distributed the certificates to the participants.

EXPERT LECTURES:

Under the aegis of Scientific Society of Council of Students Activities, Expert Lectures were organized at the institute for the benefit of staff and students:

1. Shri Manoj Kumar Goel, General Manager (Production), Simbhaoli Sugars Ltd., delivered a lecture on **“Specialty Sugar in India, Production Process and Market Demand”** on 21st August, 2019.



2. Shri D.K. Goel, Consultant delivered a lecture on **“Mill Efficiency Improvement and New Technology”** on 29th August, 2019 emphasizing on reducing power requirement at mills.



3. Dr. S.K. Nayak, Assistant Director, Shriram Institute, New Delhi delivered a lecture on the

topic **“Transition on to ISO/IEC 17025-2017 and Related Requirements for our Analytical Lab”** for the benefit of staff and students on 09th August, 2019.

4. Dr. Droupti Yadav, Asstt. Professor, CSJM University delivered an expert lecture on 02nd September, 2019 on the topic **“Pollution Control in Sugar & Alcohol Industry”**.



5. Shri H.S. Shukla, Alcohol Technologists from Indore distillery delivered an Expert Lecture on 30th September 2019 on **“Grain Based Distillery- Different raw material Options, Economy & Process”**.



RESEARCH:

1. **Utilization of potash rich ash for production of valuable bio fertilizer-** Studies on viability of prepared bio fertilizers (Rhizobium; PSB & Azatobacter) were carried

out during the period. Isolation and purification of new bio-fertilizer is in progress e.g. Tricoderma. These prepared bio-fertilizers (Rhizobium; PSB, Azatobacter & Tricoderma) will be used for field trials. Cost economics of bio-fertilizers was also worked out.

2. **Ethanol production from sugar** - Experiments for ethanol production using sugar as raw material, both on lab scale and pilot plant scale are in progress to assess the fermentation & distillation efficiencies and thus the possible yield of ethanol. The experiment is also being carried out to standardize the process parameters.

3. **Studies on the feasibility of utilization of sugarcane bagasse as a potential feedstock to access cosmetic ingredients** - In order to validate the developed method, reactions were performed on 20 g scale starting from bagasse (first replicate). Out of involved steps, two steps have been completed (Synthesis, isolation and identification by TLC).

4. **Studies on Production/Isolation of C5-Sugar Alcohol/Sugar using by-product resources of sugar industry** - The experiments related to implement the Ru - C/ iPrOH based catalytic system to access a sugar alcohol (xylitol) from bagasse derived xylose syrup have been completed. Results are not encouraging and optimization reactions are under progress. Furthermore the Organic Chemistry division is also aiming to implement fermentative conditions to access the target compound and will compare the results obtained under above catalytic system.

5. **Studies on pot-efficient synthesis of alkyl levulinates (Als) using sugarcane bagasse derived cellulose** - The Organic Chemistry division carried out several

experiments towards establishing the optimum conditions to obtain methyl levulinate directly from bagasse or pretreated bagasse implementing various metal catalysts under Parr auto-clave reactor. Out of these a copper salt is found to be efficient to facilitate such reactions. Under the optimized reaction conditions methyl levulinate was synthesized from bagasse (@ 5gm scale dry bagasse). The purification & characterization of the compound are under progress.

6. Mechanical Clarification of Juice – Initial experiments on mechanical clarification of cane juice showed positive results. Further studies on adoption of mechanical clarification technique to reduce the basic chemicals like lime & sulphur in the sugar manufacturing process were carried out during the period. For further analysis work, procurement action for suitable centrifuge machine was initiated and modified work plan has been prepared and will be taken up during season 2019-20.

7. Use of Brine reject in Final Molasses – Analysis of various molasses & brine reject samples collected from Khatauli, Simbhaoli & Naglamal sugar units, was carried out during the period. More samples of molasses & brine reject are to be collected & analyzed during forthcoming crushing season 2019-20 so as to assess effect of brine reject on molasses quality upon storage.

8. Settling test at inclined surface – Experiments with newly designed SSRT were carried out at ESF during season 2018-19. Results were found encouraging. Some modification in the design based on the results are being carried out for further experiments during season 2019-20.

9. Boiler RO/DM water heating by Concentrated Solar Thermal (CST) system – The literature survey has been completed and corresponding formulation of technical specifications/ material indenting is in progress.

10. To study the impact on performance of mechanically coupled twin induction motor drives for Shredder/Fibrizer having unequal sharing of load and to design & develop dedicated drive for the application The literature survey is under progress. Data for various combinations used in sugar factories is also being collected. Simulation work is under progress.

RESEARCH PAPERS:

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

2. **“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 published in Indian Journal of Fertilizers in July, 2019.

3. **“Utilization of Sugarcane Bagasse as Dietary Fibre”** by Neelam Chaturvedi, V. P. Srivastava, Seema Paroha & Narendra published in 77th Annual Convention and International Sugar Expo of Sugar Technologists’ Association of India held on 17-19th July 2019 at Kolkata.

4. **“Moisture Reduction in Bagasse with Minimum Investment”** by Sanjay Chauhan &

Narendra Mohan published in **7th Bharatiya Sugar Symposium 2019**”, organized in July 2019 at Kolhapur, Maharashtra.

5. **“Valorization of Sugarcane Bagasse as a Potential Feedstock to Access Cosmetic Ingredients”** by Narendra Mohan, V.P. Srivastva & Tushar Mishra published in **“77th Annual Convention and International Sugar Expo of Sugar Technologists’ Association of India”** held on 17-19th July 2019 at Kolkata.

6. **“A 3 - Level Inverter based Induction Motor Drive for Cane Preparation in Sugar Industry”** by Vinay Kumar & Sanjiv Kumar sent for publication in IEEE sponsored 2nd International and Intelligent Control seminar to be held on 18-19 October, 2019 at Greater Noida.

7. **“Measures for Indian Sugar Quality Improvement”** by Narendra Mohan, A.K. Garg & Mohit Kumar, was presented in the National Seminar on "Indian Sugars- Standardization & Quality Considerations" jointly organized by NSI-BIS-Maarc Labs. on 26th September, 2019 at NSI, Kanpur.

8. **“Sugar Quality: Requirements of Institutional and Retail Customers”** by V.P. Singh, was presented in the National Seminar on "Indian Sugars- Standardization & Quality Considerations" jointly organized by NSI-BIS-Maarc Labs. on 26th September, 2019 at NSI, Kanpur.

9. **“Quality Management – Important aspect for Indian Sugar Industry”** by Narendra Mohan, M.K. Yadav & Km. Anushka Agrawal, was presented in the National Seminar on "Indian Sugars- Standardization & Quality Considerations" jointly organized by NSI-BIS-

Maarc Labs. on 26th September, 2019 at NSI, Kanpur.

10. **“Review of Milling Efficiency”** by D. Swain was presented in **“77th Annual Convention and International Sugar Expo of Sugar Technologists’ Association of India”** held on 17-19th July 2019 at Kolkata.

CONSULTANCY:

During July-September, 2019 consultancy services were provided to the following:

1.	M/s K.M. Sugar Mills Ltd., Moti Nagar, Distt – Faizabad, U.P.
2.	M/s Kesar Enterprises Limited, Baheri, Distt – Bareilly, U.P.
3.	M/s Radico Khaitan Limited, Distt – Bareilly, U.P.
4.	M/s Uttarakhand Jal Vidyut Nigam Ltd. – Uttarakhand.
5.	M/s Harinagar Sugar Mills Ltd., Distt – West Champaran, Bihar.
6.	M/s Jind Co-operative Sugar Mills Ltd., Jind, Haryana.
7.	M/s The Kisan Sahkari Chini Mills Ltd., Tilhar, Distt – Shahjahanpur, U.P.
8.	M/s Central Pollution Control Board , New Delhi.
9.	M/s Shamanur Sugars Limited, Davangera, Karnataka.
10.	M/s Global Cane Sugar Services Pvt. Ltd., New Delhi.
11.	M/s U.P. State Sugar Co-operation Ltd., Unit – Mohiddinpur, Distt – Meerut, U.P.
12.	M/s Reliable Cashew Company Pvt. Ltd., New Mangalore, Karnataka.
13.	M/s U.P State Sugar Co-operation Ltd., Lucknow, U.P.

ANALYTICAL SERVICES:

Analytical services were rendered to following:

1.	M/s Maa Mahamaya Sahakari Shakkar Karkhana Maryadit, Ambikapur, Distt – Surajpur, Chhattisgarh.
2.	M/s The Kallakurichi Co-op. Sugar Mills Ltd., Distt – Villupuram, Tamil Nadu.
3.	M/s Perambalur Sugar Mills Ltd., Eraiyur, Distt – Perambalur, Tamil Nadu.
4.	M/s District Food & Sales Officer, Kanpur Nagar, U.P.
5.	M/s The Salem Co-operative Sugar Mills Ltd., Mohanpur, Namakkal, Tamil Nadu.
6.	M/s The Sonipat Co-operative Sugar Mills Ltd., Sonipat, Haryana.
7.	M/s National Co-operative Sugar Mills Ltd., Distt – Madurai, Tamil Nadu.
8.	M/s Arignar Anna Sugar Mills Ltd., Distt - Thanjavur, Tamil Nadu.
9.	M/s M.R. Krishnamurthy Co-operative Sugar Mills Ltd., Distt – Cuddalore, Tamil Nadu.
10.	M/s The Kisan Sahkari Chini Mills Ltd., Unit – Satha, Distt – Aligarh, U.P.

The samples of sugar and molasses, were analyzed for the desired parameters in the NSI-Analytical Laboratory (NABL Accredited). The institute also obtained BIS accreditation for the analytical laboratory.

VISITORS FROM ABROAD:

1. Mrs. Emilia Cartier, Attaché for university, scientific and technological cooperation visited the institute. She gathered information on various courses being conducted by the institute.



2. A 15 -member delegation from Cane & Sugar Board, Thailand and Thailand Society of Sugarcane Technologists visited the institute for looking at academic and research activities on 16th August, 2019. The delegation discussed possibilities of undertaking collaborative research on the areas of development of value added products.



OUR OTHER ACTIVITIES:

1. Orientation Programme for the freshers was organized at the institute on 30th July, 2019. On this occasion Director, National Sugar Institute addressed the students and stressed upon for upgrading professional skills and to have a successful balanced life in order to keep away frustration, unfairness and isolation. Education in charge and hostel warden's also addressed the students and briefed them about the various rules & regulations.



2. Prof. Narendra Mohan, Director, Dr. A. Bajpai, Prof. Sugar Technology & Shri Subhash Chandra, Junior Technical Officer were conferred with Noel Deerr Gold Medal for the best research paper during the 77th Annual convention of STAI held on 17-19th July, 2019 at Biswa Bangla Convention Centre, New Town, Kolkata, W.B.



3. Mr. Rajneesh Tyagi, an alumni (DIFAT) at present working with North West Bio-Energy Ltd., Canada, & also as Visiting Professor, Department of Chemical and Biological Engineering at University of Saskatchewan visited the institute for recruitment of Alcohol Technologists on 05th August, 2019.

4. On the 73rd **Independence Day**, Director, hoisted the National Flag at the Institute and addressed the staff, students and faculty

members. The prizes were distributed to Staff and Students who emerged as winners during various competitions organized during the Swachhta Pakhwada.



5. Institute continued it's efforts for creating awareness about environment protection and in this series a programme on "**Tree Plantation**" was organized on 06th August, 2019.

6. Director, NSI addressed Technical Conclave organized by M/s DCM SHRIRAM LTD. (DSCL) at Lucknow on the topic "**Control of Process Parameters for Higher Technical Efficiency**" 7th August, 2019.



7. Campus interviews were conducted by M/s Dalmia Bharat Sugar Mills Ltd., M/s Saraswati Sugar Mills Ltd., M/s DCM Shriram Ltd., M/s

ISGEC, M/s Balrampur Chini Mills Ltd., & M/s Uttam Sugar Mills Ltd. for placements from various courses during the period.



Conservation in Sugar & Ethanol Processing” in which students participated enthusiastically.



9. 15 nos. B.Sc. (Ag.) students of Pacific University, Udaipur for “RAWE” programme under ICAR-IISR, Lucknow visited the institute on 29th August, 2019 to seek information on sugarcane cultivation & processing.



10. Meeting of the Committee of Experts constituted by the Govt. of India under the Chairmanship of Director, National Sugar Institute for approval of Sugar Standards Grades for the season 2019-20 was held on 25th September, 2019.

8. The Annual Function of the **"Scientific Society"** under the Council of Student's Activities was organized on 18th September, 2018. Quiz, presentation & other related competitions were organized on this occasion. Dr. Rajpal Singh, Advisor, International Finance Corporation (World Bank Group) and an eminent Sugarcane Technologist graced the occasion as Chief Guest. **"SUGRATHON"** was also organized on the topic **"Water**



The distribution of Standards shall commence from 1st October, 2019.

11. “Vishwakarma Pooja” was organized in the Experimental Sugar Factory & Instrumentation Division on 17th September, 2019.



13. The students of various courses organized a function to celebrate the **Fresher’s Party** on 06th September, 2019. Many activities viz. singing, dance and mono-acting etc. were performed by the students. Mr. & Ms. Fresher were also selected during the event.



12. संस्थान में दिनांक 1 से 14 सितंबर, 2019 के दौरान हिंदी पखवाड़ा मनाया गया तथा हिंदी दिवस पर पुरस्कार वितरण समारोह संपन्न हुआ। हिंदी पखवाड़ा के दौरान आयोजित विविध प्रतियोगिताओं में विजेता कर्मचारियों एवं छात्रों को पुरस्कृत किया गया।



14. Under the Swachhata activities, “Swachhata Hi Seva” & “Plastic Waste Management” were also organized at the Institute from 11th September, 2019. Various activities like tree plantation, cleaning activities in & around surroundings, awareness on reducing single use plastic wastes, inspiring the primary school students about the importance of cleaning, conducting drawing competition on “Swachhata Hi Seva” & “Plastic Waste Management” in a nearby primary school were conducted.

