



**October -
December
2022**

NATIONAL SUGAR INSTITUTE, KANPUR – 208017 (U.P.) INDIA



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Many milestones created by the Indian Sugar Industry in the sugar season 2021-22 as the country became the largest producer and second largest exporter of sugar. Highest ever ethanol blending also became possible with supplies of about 4000 million liters of ethanol. The growth of ethanol as a biofuel sector has become possible due to proactive policies of Government of India.

During the current sugar season 2022-23, till November 2022, the sugar production is higher by around 1.5% compared with the same period a year ago. Sugar production during the period after accounting for ethanol diversion was 4.79 million MT as against 4.72 million MT last year. With the expected sugarcane production during the current, exports and diversion of sugar for producing ethanol are going to be crucial to facilitate demand-supply scenario.

Institute while working on development of newer techniques of juice clarification so as to evolve cleaner & greener process in place of existing Double Sulphitation process, remained active carrying out R&D for developing value added products. We look forward for your active participation during the International Conference being organized jointly with Assiut University, Egypt at Luxor, Egypt from 11-14th February 2023.

**Narendra Mohan
Director**

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<http://www.nsi.gov.in>
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DELEGATION FROM FIJI VISITS INSTITUTE

Four member delegation from Fiji headed by Ms. Reshmi Kumari, Director, Planning, Policy & Research, Ministry of Sugar Industry visited National Sugar Institute on 19th October 2022.

The delegation which also included Chief Executive Officer, Fiji Sugar Corporation and Chairman, Sugar Research Institute of Fiji visited institute to explore possibilities of seeking National Sugar Institute assistance in modernization and development of the sugar industry in Fiji.



FOUNDATION DAY CELEBRATED:

National Sugar Institute, Kanpur celebrated "**87th Foundation Day**" and felicitated "**Progressive Sugarcane Farmers**" and "**Ex- Institute Officials**" on 4th October 2022. Prof. Vinay Pathak, Vice Chancellor, CSJM University and Dr. Sushil Solomon, Ex. Vice Chancellor, CSA University of Agriculture and Technology graced the occasion. Director, NSI lauded the role of sugarcane farmers in sugarcane productivity enhancement.



TWO DAY ONLINE TRAINING PROGRAMME ORGANIZED:

Two days Online training programme on "**Effluent Treatment Plant Operation & Analysis of Effluent**" was organized on 11th & 12th October 2022. The training programme was meant for the benefit of sugar and alcohol industry and the delegates were apprised about the targets which had been envisaged for reducing fresh water consumption and subsequently controlling the effluent discharge as per Central Pollution Control Board guidelines.

More than 80 delegates from states of U.P., Bihar, Himanchal Pradesh, Tamil Nadu, Karnataka and Maharashtra participated in the programme.



EDUCATIONAL TOUR ORGANIZED FOR STUDENTS:

National Sugar Institute, Kanpur organized educational tours for the students of Post Graduate Diploma Course of Associateship of National Sugar Institute in Sugar Engineering (ANSI-SE), Post Graduate Diploma Course in Industrial Fermentation and Alcohol Technology (DIFAT), Post Graduate Diploma Course in Sugarcane Productivity & Maturity Management (DSPMM) and Post Graduate Diploma Course in Instrumentation & Process Control in various sugar factories, distilleries & allied industries situated in different states to learn about sugarcane



management, process techniques, ethanol manufacturing process, raw & refined sugar manufacturing process, engineering techniques, etc.

WORKSHOP ON MEDITATION ORGANIZED:

A **“Meditation Workshop”** was organized at National Sugar Institute, Kanpur by **“Heartfulness”** organization on 29th November 2022, for the staff and students. On this occasion, a book **“The Wisdom Bridge”** written by Mr. Kamlesh

D. Patel “Daaji” of Heartfulness organization was released by the Director, NSI, Kanpur containing nine principles which are considered important references for parents, parents-to-be, grandparents and caregivers to create fulfilling and happy lives.



MEETING OF ACADEMIC COUNCIL:

Meeting of Academic Council of the institute was held on 29th December 2022, under the chairmanship of Director NSI to discuss about revision of syllabus of various courses and various issues related to entrance examination viz. revision of prospectus with respect to entrance qualifications and fee structure for various course conducted by the institute for the academic session 2023-24.



RESEARCH WORK:

- 1. Studies on Sweet Sorghum bagasse value addition:** Re-analysis of Sweet Sorghum bagasse composition and related fractionated components (Cellulose, Hemi-cellulose and lignin) was carried out. The experiment related to fractionation of individual component of new variety i.e. ICSSH28 was also carried out during the period.
- 2. Comparative study of five varieties of sweet sorghum for production of ethanol yield:** Five varieties of sweet sorghum were harvested and juices obtained were analysed for Brix, Pol, Purity, TRS, RS & pH. The juices were then fermented and distilled for ethanol production in lab and in pilot plant. Results are being compiled.
- 3. Cane juice syrup study for shelf-life and production of alcohol:** Two Syrup samples were preserved in Biochemistry division at room temperature. Preserved Syrup showed no appreciable deterioration, while °Brix showed no changes in both the samples, the TRS content of sample from plantation white sugar factory showed no appreciable changes, but purity drop of around 2-unit was seen in raw sugar factory sample after about 10 months. New samples are being collected from different factories to validate the results.
- 4. Waste water purification using water hyacinth:** Institute is conducting experiments to ascertain efficiency of water purification based on Phytoremediation principle using water hyacinth. Samples of surplus

condensates and effluent have been collected from various sugar factories of different states and treatment using water hyacinths in combination with tertiary treatment units has been tried. Encouraging results have been obtained with respect to removal of BOD, COD, nitrogen, heavy metals and pesticides.



- 5. Production of Invert Syrup directly from sugarcane juice:** The study taken up at Sugar Technology division is aimed producing medium invert sugar syrup directly from sugarcane juice. At present, such invert syrup is produced using sugar as raw material.



The process involves in situ purification of sugarcane juice without addition of any clarifying agents. Different techniques of high level filtration and inversion are being tried. Samples of such invert syrup shall be analyzed for quality parameters and shelf life periodically.

6. **Study of sugar beet varieties for ethanol production:** Six sugar beet germplasm lines, viz., IISR Comp 1, LS 6, LKC HB, LKC 2020, LKC LB, LKC 2006 were sown by the Agriculture Chemistry division and will be harvested in the month of April. Then their potential will be evaluated for farm productivity and ethanol production potential.

7. **Comparative study on polarization by using lead and non-lead based clarificants and employing NIR polarimetry:** Comparative study was carried out by polarising samples of B-Heavy molasses at wavelengths of 589 nm & 880 nm and by applying different doses of Carrez reagent i.e. @ 0.1 ml, 0.2 ml & 0.5 ml. In both the cases i.e. at 589 nm & 880 nm the polarization of B heavy molasses was out of range. Further studies are being carried out on juices, syrups and other low coloured process intermediates.

8. **Use of Guljag Crystasulf for sugar cane juice clarification:** Trials of liquid SMBS were conducted during the period on various doses of MOL 1.0 %, 1.2 %, 1.4 %, & 1.6 % V/V on raw juice after heating up to 70 deg. C and then neutralizing the liquid juice by applying liquid SMBS. Remaining procedure was kept same as carried out in earlier experiments

using powder SMBS. Results obtained by using liquid SMBS were observed better in terms of transmittance, colour, turbidity & mud removal as compared to the results obtained by using powder SMBS.

9. **Mechanical clarification of sugarcane juice:** Few sets of experiments were conducted using sugar cane varieties (CO-0118 & UP- 05125). The study was made using different filtration techniques i.e. pressure filtration using ceramic membranes and centrifugations. Different parameters in raw juice & filtered raw juice were analysed to ascertain efficiencies. Further trials shall be carried out for reaching to conclusion.

10. **Studies on use of B Heavy molasses as edible molasses/ high taste molasses:** Samples of B heavy molasses collected were analysed for Magnesium, Potassium, Calcium, Manganese & Iron content besides analysis for sucrose, reducing sugar etc. For clarification of B heavy molasses (for use as edible molasses) centrifugation techniques has been adopted. Trials are in progress and data shall be compiled.

RESEARCH PAPERS:

1. A research paper entitled **“Bagasse based value-added products: Looking beyond boundaries”** by Narendra Mohan published in Indian Sugar Journal, October – 2022.
2. A research paper entitled **“Sugar Industry-Harnessing the Unexploited Potential”** by Narendra Mohan sent for publication in 10th International Conference on Sugar

and Integrated Industries to be held in Luxor, Egypt, 11-16 February 2023.

3. A research paper entitled **“Conservation of Energy in Sugar Industry”** by Prof. D Swain sent for publication in 10th International Conference on Sugar and Integrated Industries to be held in Luxor, Egypt, 11-16 February 2023.
4. A research paper entitled **“Healthier Sugar: Possibilities and Future Prospects”** by Narendra Mohan, published in International Journal of Engineering research & Technology (IJERT), ISSN:2278-0181, Vol.11 Issue 11, November-2022.
5. A research paper entitled **“Exploiting Sugarcane Value Chain – Indian Experience”** by Narendra Mohan sent for publication in 95th SASTA Congress to be held at Durban, South Africa from 15th – 17th August 2023.
6. A research paper entitled **“Classification of Indian Sugars – Then & Now”** by Narendra Mohan sent for publication in Indian Sugar.
7. A research paper entitled **“Sugar Beet: A Potential Crop for Production of Biofuel and other Value-Added Products”** by Sharad Babu, Lokesh Babar, Ashok Kumar & Narendra Mohan published in **“SHARKARA – October -December 2022”**.

CONSULTANCY:

Request for availing consultancy services of the institute were received and also provided to various sugar factories ethanol & other allied units on various technical matters relating to diversion of

B Heavy molasses/syrup, validation of ETP’s, preparation of DPR’s, validation of no increase in pollution loads in ethanol units upon enhancement in capacity etc.

1	M/s Triveni Engineering & Ind. Ltd., Unit – Milak Narayanpur, Rampur, U.P.
2	M/s Bajaj Hindusthan Sugar Ltd., Distillery Unit – Gangnauli, Saharanpur, U.P.
3	M/s Uttam Sugar Mills Ltd., Sugar Unit – Khaikheri, Muzaffarnagar, U.P.
4	M/s Daya Sugar (A Unit of B.K. Investment Services Pvt. Ltd.), Gopalhari, Saharanpur, U.P.
5	M/s Rajasthan State Ganganagar Sugar Mills Ltd., Rajasthan
6	M/s Uttam Sugar Mills Ltd., Unit-Barkatpur, Bijnor, U.P.
7	M/s Uttam Sugar Mills Ltd., Unit-Sheramau, U.P.
8	M/s Triveni Engineering & Ind. Ltd., Unit – Chandanpur, Amroha, U.P.
9	M/s Bajaj Hindustan Sugars Ltd., Unit-Golagokarnath, Kheri, U.P.
10	M/s Bajaj Hindustan Sugars Ltd., Unit-Palia Kalan, L. Kheri, U.P.
11	M/s Bajaj Hindustan Sugars Ltd., Unit-Khambharkhera, Lakhimpur Kheri, U.P.

12	M/s Triveni Engineering & Industries Ltd., Unit-Deoband, Saharanpur, U.P.
13	M/s Magadh Sugar & Energy Ltd., Unit-Hasanpur Sugar Mills Ltd., Samastipur, Bihar
14	M/s Bajaj Hindustan Sugars Ltd., Unit-Maqsoodapur, Shahjahanpur, U.P.
15	M/s Bajaj Hindustan Sugars Ltd., Unit-Thana Bhawan, Shamli, U.P.
16	M/s DCM Shriram Limited, Sugar Unit – Ajbapur, Lakhimpur Kheri, U.P.
17	M/s Dalmia Bharat Sugar & Industries Limited, Unit-Nigohi, Shahjahanpur, U.P.
18	M/s Balrampur Chini Mills Ltd., Unit-Tulsipur, Balrampur, U.P.
19	M/s Bajaj Hindusthan Sugar Ltd., Unit – Kinauni, Meerut, U.P.
20	M/s Bajaj Hindusthan Sugar Ltd., Unit– Gangnauli, Saharanpur, U.P.
21	M/s Bajaj Hindusthan Sugar Ltd., Unit – Kundarkhi, Gonda, U.P.
22	M/s Bajaj Hindusthan Sugar Ltd., Unit – Pratapur, Deoria, U.P.
23	M/s Bajaj Hindusthan Sugar Ltd., Unit – Rudauli, Basti, U.P.
24	M/s Avadh Sugar & Energy Ltd., Sugar Unit – Hargaon, Sitapur, U.P.

25	M/s Avadh Sugar & Energy Ltd., Distillery Unit – Hargaon, Sitapur, U.P.
26	M/s UP State Sugar Corporation Ltd., Gomtinagar, Lucknow, U.P.
27	M/s Avadh Sugar & Energy Ltd., Sugar Unit – Seohara, Bijnor, U.P.
28	M/s Dalmia Bharat Sugar & Industries Ltd., Unit – Ramgarh, Sitapur, U.P.
29	M/s Dwarikesh Sugar Ind. Ltd., Unit – Dwarikesh Nagar, Bijnor, U.P.
30	M/s Triveni Engineering & Ind. Ltd., Unit – Sabitgarh, Bulandshahr, U.P.
31	M/s Naglamal Sugar Complex, Unit – Naglamal, (A Unit of Mawana Sugar Ltd.), Meerut, U.P.
32	M/s Wave Industries Pvt. Ltd., Unit – Dhanaura, Amroha, U.P.
33	M/s DCM Shriram Ltd., Sugar Unit – Loni, Hardoi, U.P.
34	M/s Uttarakhand Pollution Control Board, Dehradun, U.K.
35	M/s Triveni Engineering & Ind. Ltd., Unit – Khatauli, Muzaffarnagar, U.P.
36	M/s Saraswati Sugar Mills Ltd., Yamunanagar, Haryana
37	M/s Harinagar Sugar Mills Ltd., Unit – Harinagar, West Champaran, Bihar

38	M/s LH Sugar Factories Ltd., Pilibhit, U.P.
39	M/s Balrampur Chini Mills Ltd., Unit – Gularia, Lakhimpur, U.P.
40	M/s Uttam Sugar Mills Ltd., Unit – Libberheri, Haridwar, U.K.
41	M/s Balrampur Chini Mills Ltd., Unit – Akbarpur, Ambedkar Nagar, U.P.
42	M/s Balrampur Chini Mills Ltd., Unit – Kumbhi, Lakhimpur Kheri, U.P.
43	M/s DCM Shriram Ltd., Unit – Rupapur, Hardoi, U.P.
44	M/s The Haryana Co-operative Sugar Mills Ltd., Rohtak, Haryana
45	M/s Wave Industries Pvt. Ltd., Unit – Bijnor, Bijnor, U.P.
46	M/s Bajaj Hindusthan Sugar Ltd., Distillery Unit – Khambharkhera, Lakhimpur Kheri, U.P.
47	M/s Dalmia Bharat Sugar & Industries Ltd., Unit – Jawaharpur, Sitapur, U.P.
48	M/s Magadh Sugar & Energy Ltd., Unit – New Swadeshi Sugar Mills Ltd., Bihar
49	M/s UP Co-operative Sugar Factories Federation Ltd., Distillery Unit – Nanauta, U.P.
50	M/s Balrampur Chini Mills Ltd., Unit – Babhnan, Gonda, U.P.

51	M/s Seksaria Biswan Sugar Factories Ltd., Sitapur, U.P.
52	M/s Gobind Sugar Mills (A Division of Zuari Ind. Ltd.), Lakhimpur Kheri, U.P.
53	M/s DCM Shriram Ltd., Unit – Hariawan, Hardoi, U.P.
54	M/s Triveni Engineering & Ind. Ltd., Unit – Raninangal, Moradabad, U.P.

ANALYTICAL SERVICES:

Besides analysis of sugar & sugar house products, ethanol and effluents etc., Institute offers testing of Ethyl Alcohol based Sanitizer in its sophisticated, most modern NABL accredited analytical laboratory and other laboratories of the institute. Testing of bagasse for determination of GCV and lime for various constituents also taken up during the period. Analytical services were rendered to following:

1	M/s Uttam Sugar Mills Ltd., Sugar Unit – Khaikheri, Muzaffarnagar, U.P.
2	M/s Kisan Sahkari Chini Mills Ltd., Sultanpur, U.P.
3	M/s Kisan Sahkari Chini Mills Ltd., Unit – Ghosi, Mau, U.P.
4	M/s Ramala Cooperative Sugar Mills Ltd., Ramala Bagpat, UP.
5	M/s The Ganga Kisan Sahkari Chini Mills Ltd., Unit -Morna, Muzaffarnagar, U.P.
6	M/s Kisan Sahkari Chini Mills Ltd., Unit – Sultanpur, U.P.
7	M/s Uttam Sugar Mills Ltd., Sugar Unit - Barkatpur, Bijnor, U.P.

8	M/s Magadh Sugar and Energy Ltd., (Unit - Bharat sugar Mills), Gopalganj, Bihar
9	M/s Balrampur Chini Mills Ltd., Unit - Akbarpur, Ambedkar Nagar, U.P.
10	M/s Dhampur Bio Organics Ltd., Unit - Asmoli, Sambhal, U.P.
11	M/s Dhampur Bio Organics Ltd., Unit - Meerganj, Bareilly, U.P.
12	M/s Dhampur Bio Organics Ltd., Unit - Mansoorpur, Muzaffarnagar, U.P.
13	M/s Bajaj Hindusthan Ltd., Unit - Kinauni, Meerut, U.P.
14	M/s Avadh Sugar & Energy Ltd., Sugar Unit - Seohara, Bijnor, U.P.
15	M/s Triveni Engineering & Ind. Ltd., Unit - Khatauli, Muzaffarnagar, U.P.
16	M/s Bajaj Hindusthan Sugar Ltd., Unit - Kundarkhi, Gonda, U.P.
17	M/s Triveni Engineering & Ind. Ltd., Unit - Sabitgarh, Bulandshahr, U.P.
18	M/s Ugar Sugar Works Ltd., Ugar, Karnataka
19	M/s Magadh Sugar & Energy Ltd., Unit - New Swadeshi Sugar Mills Ltd., Bihar

OUR OTHER ACTIVITIES:

1. राष्ट्रीय शर्करा संस्थान वार्षिक स्पोर्ट्स मीट- 2022 का समापन स्टाफ इलेवन बनाम स्टूडेंट इलेवन के बीच खेले गए एक सीमित ओवर क्रिकेट मैच के साथ हुआ। समापन दिवस की शुरुआत दो महान भारतीय आत्माओं, महात्मा गांधी, जिन्होंने सत्य और अहिंसा का मार्ग सिखाया और श्री लाल बहादुर शास्त्री, जिन्होंने बलिदान का जीवन जीने का मार्ग दिखाया, को सम्मान देते हुए हुयी।

विजेताओं को पुरस्कार श्री नरेंद्र मोहन, निदेशक द्वारा वितरित किए गए, जिन्होंने विजेताओं को बधाई देते हुए छात्रों

से प्रतिदिन एक घंटा गहन शारीरिक गतिविधि पर खर्च करने का आह्वान किया और कहा कि खेल ऐसा करने का सबसे अच्छा साधन है। उन्होंने कहा कि शारीरिक फिटनेस और मानसिक स्थिरता को बढ़ाने के अलावा खेल भाईचारे को भी बढ़ावा देते हैं।



2. Director National Sugar Institute, Kanpur, addressed technical officers of M/s Balrampur Chini Mills Ltd. on the topic "**Business Model for Sugar-Ethanol Balance**" during Training Program organized at Lucknow on 10th October 2022. Interactions was also made by institute experts on "Use of MVR's for reducing steam consumption", "Causes of sugar dust formation and prevention of explosion" and on "Automation Trends & Future Requirements".



3. Director, National Sugar Institute, Kanpur inaugurated the newly

constructed library for girl students on 14th October 2022 at Girl's Hostel of the Institute. The library has computers with wi-fi facility to access books and journals online.



4. Director National Sugar Institute, Kanpur was conferred with **“Excellence Award”** for exemplary contribution in development of sugar and ethanol production technology during the International Conference, SUGARCON 2022, organized by International Association of Professionals in Sugar and Associated Technologies at Indian Institute of Sugarcane Research, Lucknow during 16th - 19th October 2022.



5. Renovated Dining Hall of Hostel No. 2 of the National Sugar Institute, Kanpur

was inaugurated by Ms. Margaret Gangte, Director (Sugar Administration), Department of Food & Public Distribution, Ministry of Consumer Affairs, Food & Public Distribution on 18th October 2022.



6. A **“Millet's Corner”** has been created in the departmental canteen of National Sugar Institute, Kanpur, where millets (jowar, bajra and ragi) based products viz. cookies, puffs and multi-grain flour have been provided for sale to the staff and students on 20th October 2022.



7. स्वच्छता जागरूकता के सन्दर्भ में चलाये जा रहे विशेष अभियान " स्वच्छता पखवाड़ा २०२२" (स्पेशल कैपेन २.०) के अंतर्गत राष्ट्रीय शर्करा संस्थान, कानपुर के अधिकारियों, कर्मचारियों एवं छात्रों द्वारा श्री अशोक गर्ग, नोडल अधिकारी के नेतृत्व में स्वच्छता के विभिन्न कार्यक्रम अक्टूबर माह में चलाये गये। इसी क्रम में निदेशक महोदय

द्वारा प्लास्टिक के प्रयोग को रोकने हेतु कपड़े से बने हुए थैलों का वितरण किया गया ।



8. To commemorate the 147th birth anniversary of Sardar Vallabhbhai Patel on **“Rashtriya Ekta Diwas”, “Run for Unity”** was organized by National Sugar Institute, Kanpur. Floral tributes were paid to the **“Iron Man”** of the country and **“Rashtriya Ekta Diwas Pledge”** was administered to the staff and students.



9. Autumn planting of sugarcane at farm of National Sugar Institute, Kanpur was carried out during the month. Young and enthusiastic students of Sugarcane Productivity & Maturity Management were observed planting of sugarcane seeds of Co

15023, CoLk 14201 and CoS 13235 with their own hands to learn details of various methods of planting and seed treatment



10. राष्ट्रीय शर्करा संस्थान कानपुर की ओर से दिनांक 1 नवंबर 2022 को परिसर में निशुल्क स्वास्थ्य शिवर का आयोजन, अपोलो स्पेक्ट्रा हॉस्पिटल कानपुर के द्वारा कराया गया। शिविर का छात्र - छात्राओं , शिक्षकों, कर्मचारियों , के अलावा आसपास के लोगों ने भी लाभ उठाया।



11. Director National Sugar Institute, Kanpur distributed **“IDBI Bank Golden Jubilee Scholarships (2022-23)”** on 10th November 2022 to the meritorious and deserving students at Ram Krishna Mission School, Kanpur. Swami Atmashradhanand of Ram Krishna Ashram was also present on this occasion.



12. राष्ट्रीय शर्करा संस्थान मे हिंदी (राजभाषा) कार्यशाला का आयोजन दिनांक 30 दिसम्बर 2022 को किया गया जिसमे संस्थान विभिन्न अधिकारियों एवं कर्मचारियों को अधिक से अधिक कार्य हिंदी मे करने हेतु निदेशक द्वारा प्रेरित किया गया।



13. National Sugar Institute, Kanpur, celebrated the occasion of **“Indian Constitution Day”** by taking pride in our constitution and abiding by it on 26th November 2022. Preamble to the Indian Constitution read by Officers and Staff of NSI, Kanpur.

14. राष्ट्रीय आविष्कार अभियान 2022-23 के अन्तर्गत बेसिक शिक्षा विभाग कानपुर नगर द्वारा विकास खण्ड बिल्हौर स्थित विभिन्न विद्यालयों के छात्र-छात्राओं ने राष्ट्रीय शर्करा संस्थान में विज्ञान-शैक्षिक भ्रमण किया।



15. Students of M.Sc. (Chemistry) of Brahmanand College, Students of M.Sc. and B.Sc. courses from BND College, Kanpur, Students of B. Pharm, II-year, Krishna Institute of Pharmacy and Sciences visited National Sugar Institute, Kanpur and also attended an interactive session addressed by Director, NSI and other faculty of the institute.

