SHARKARA

JULY-SEPTEMBER- 2018 VOLUME- 49, NO. -03

NATIONAL SUGAR INSTITUTE

MINISTRY OF CONSUMER AFFAIRS, FOOD & PUBLIC DISTRIBUTION

DEPARTMENT OF FOOD & PUBLIC DISTRIBUTION

GOVERNEMENT OF INDIA

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SHARKARA

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It contains……

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From Director's Desk.....

Learning by the experience, the sugar industry has at-least started brainstorming on value addition through various routes and production of different kind of sugars as per consumer needs and market requirements. The industry has to develop out of box thinking and diversifications, integrations, value additions are going to be key to success.

The pricing policy for ethanol announced recently by the Government of India ensuring higher prices for Ethanol produced from B Heavy molasses and 100% diversion of sugarcane juice shall go a long way in making sugar industry sustainable. Sugar Industry should also take advantage of it and financial assistance been offered for Ethanol capacity building. The sugar demand- supply balance through ethanol production is essential for stable sugar prices, value addition and for energy security of the country as well keeping in view the recent issues related to import of crude oil.

Sugar industry has to think of raw- refined route of sugar production rather than sticking to age old conventional process of plantation white sugar production which has its own limitations for trade in the global markets. As I emphasize always, branding of Sugars is essential for earning price premiums.

Wishing you all the very best for the crushing season 2018-19.

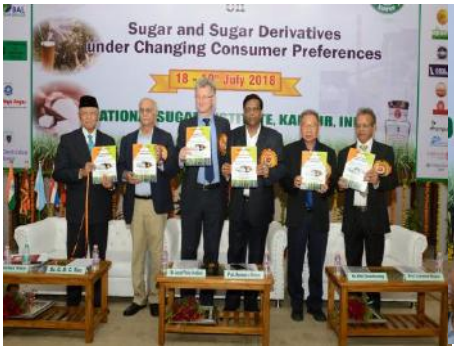
(Narendra Mohan)
Director

➢ OUR PROVISIONS:

➢ SEMINAR & WORKSHOP ORGANIZED:

➢ INTERNATIONAL CONFERENCE:

1. International Conference on ***"Production of Sugar & Sugar Derivatives under Changing Consumer Preferences"*** was organized at the institute on 18 to 19th July 2018. More than 300 delegates from USA, UK, Uganda, Sri Lanka, Indonesia, Nepal, Thailand and from India participated in the Conference. Presentations were made on production of various types of sugars keeping in view their direct and industrial consumption. In addition to this, presentations were also made on production of low-calorie sweeteners and cane juice preservation. Details of a study on "Sugar Consumption & Health- Myth & Realities" was also presented wherein it was highlighted that sugar may not be considered as the only culprit for obesity and diabetes. Our life style, working and amount of calorie burnt is more important.



ShriRavikant, Secretary (Food & Public Distribution), Government of India gracing the concluding day of the two days International Conference and conferring Sharkarashri to five distinguished alumni of the institute who turned out to be Job Creators rather than Job Seekers and contributing in "Make in India" programme. The award was conferred to Dr. G S C Rao, Mr. VRL Rao, Mr. G D Agarwal, Mr. Pramod Belsare and Dr. Manoj Srivastava.

➢ REFRESHER COURSE:

2. **"Refresher Course - 2018"** for sugar industry personnel was conducted at the institute from 16 to 20th July 2018 wherein total 86 technical personnel from various sugar industries/ organization from different states participated. Dr. (Mrs.) Nilima Gupta, Vice Chancellor, CSJM University, Kanpur inaugurated the course.

Lectures on important topics viz. Value Addition, Energy Conservation, Cane Management, Effluent & Environment Management etc. were delivered by the experts from the institute and other organizations. An interactive session was also organized for the participants to clear their doubts on any technical matter related to sugar and ethanol production. The participants also got a chance to attend the International Conference organized by the institute on 18th and 19th July 2018 at the Institute.

➢ TRAINING PROGRAMME FOR OFFICIALS FROM SRILANKA:

Institute conducted three weeks Faculty Development Programme for the technical personnel from **Sugar Research Institute, Sri Lanka** in July-August 2018. They were imparted theoretical as well as practical training on various aspects of Industrial Fermentation, Distillation and Sugar Processing. In addition to this, knowledge on Effluent Treatment and other Environmental issues was also imparted.

➢ OTHER TRAINING PROGRAMMES ORGANIZED:

1. Training Programme on **"Laboratory Management and Analytical Procedures"** was conducted by Dr. Rakesh Kumar, Senior Lead Assessor of NABL for the benefit of staff and students of the institute. Dr. Kumar explained the precautions to be taken while performing the analysis and necessity of maintaining the calibration schedule for various laboratory instruments/equipment. Importance of quality of laboratory chemicals in performing tests was also highlighted by him.


2. Customized Training Programme for the technical personnel of **M/s Manas Agro Industries** was conducted at Nagpur wherein they were detailed on standard operating procedures in a plantation white sugar plant.



3. Three training programmes on **"Effluent Treatment Plant Operation & Techniques of Effluent/ Waste Water Analysis"** were conducted during July to September 2018 for the factory professionals from various sugar producing states.



4. Four weeks Customized Training Programme for the **Graduate Engineer Trainees of M/s EID Parry (India) Ltd., Chennai** was conducted at the Institute. Theoretical as well as practical training was imparted to the trainees on various techniques of cane handling, milling, juice extraction, clarification, evaporation and crystallization etc.



➢ SEMINAR/CONFERENCES ATTENDED:

1. Director, NSI, attended the 12th World Congress on "Bio-fuels & Bio-energy" with Prof. D Swain at Zurich, Switzerland. He also made a presentation on the topic ***"Efficient Use of Sugarcane Bio-Energy for Sustainable Sugar Production in India".***



2. One-day Seminar on ***"Production of Sulphurless Raw Sugar followed by Refined Sugar"*** was jointly organized by National Sugar Institute & M/s Nirani Sugars Ltd. at Nirani Sugars Ltd. Mudhol, Karnataka. He also made presentation on comparative techno-economics of different process for production of Sulphurless Sugar.

3. Director, National Sugar Institute inaugurated the Annual Symposium of "Bharatiya Sugar" at Kolhapur on the topic **"Sustainability of the Sugar Industry".** Papers on present status of effluent treatment and on novel technique of waste water treatment were also presented by the institute.



4. Director, NSI, attended the 48th Annual Convention of SISSTA at Belagavi Karnataka on 21st – 22nd September, 2018 and delivered Parthasarthy Memorial lecture on **"Protocol for by Product Utilization for Value Addition"**. Shri S.K. Trivedi, Asstt. Prof. Sugar Technology & Shri A.K. Shukla, Jr. Technical Officer (Sugar Technology) also attended the Convention.

5. One day National Seminar **"AMIFOST 2018"** was jointly organized with Amity University, Noida, wherein a presentation on ***"Sugar-Life-Health & You"*** was also made by the institute. One full session of the seminar was exclusively dedicated to sugar during which presentations were made by Shri Sanjay Awasthi, President, STAI, Dr. G S C Rao, Managing Director, Global Canesugar Services Pvt. Ltd and Shri R L Tamak, Executive Director, DCM Shriram Ltd.

➢ EXTENSION LECTURES :

Under the Aegis of Scientific Society of Council of Student's Activities expert lectures were delivered by many eminent Scientists & Technologists.

1. Shri K. Jagadeesh (Consultant), J.P. Mukherji & Associates Pvt. Ltd., Pune delivered a lecture on **"Role of Chemical Control in the Efficient Operation of Plan"** on 26thSeptember 2018 atthe institute for the benefit of students as well as faculty.



2. Shri Rajeev Gupta (General Manager-Marketing), Jindal Stainless Ltd. Gurgaon, addressed the staff and students on the topic **"Stainless Steel usage in various spheres of life"**on 19thSeptember 2018. Students also got a chance to see the demonstration bus and also carry out SS welding.

➢ OUR OTHER ACTIVITIES:

1. On 13thAugust 2018, a blood donation camp was organized at the institute in association with M/s G.S.V.M. Medical College wherein 58 units of blood was donated.


2. On 72ndIndependence Day, the Director, hoisted the National Flag at the Institute and addressed the staff, students and faculty members. He called upon the students to follow ADD–Attitude, Discipline, The prizes were also distributed to the winners of various competitions organized during the Swachhta Pakhwada organized earlier.

3. Keeping in view the necessity of Library facilities beyond office hours, library facilities were developed at Hostel No.3 and inaugurated. ShriParam Singh, General Manager, Production, Dalmia Bharat Sugar Mills also graced the occasion.



4. The students of various courses organized a function to celebrate the Fresher's Party on 29thAugust, 2018. Many activities viz. singing, dance and mono etc. were performed by the students. Selection of Mr. & Ms. NSI was also made after several rounds.



5. Campus interview by Daurala Sugar Works, JP Mukherjee & Associates, Dalmia Sugars Ltd., DCM Shri Ram (DSCL), Dhampur Sugar Mills Ltd.,K M Sugar Mills Ltd., and Uttam Sugars were conducted at the institute & more than 70 students have been selected.



6. Interactive session was organized at the institute for 20 nos. IAS & IFS probationers on the topic **"Sugar Industry in India-Opportunities & Challenges"**. Director, NSI and Prof. D. Swain addressed the probationers and presented the overview of the Indian Sugar Industry.

7. Interactive Session for technical officials of HPCL Biofuels was conducted at Patna to discuss areas for improvement and benchmarking of efficiency parameters at various unit operations during production of plantation white sugar.

8. Institute arranged an Orientation programme for the fresh batch students admitted during the academic session 2018-19 in various courses conducted by the Institute. Shri Narendra Mohan, Director addressed the students and stressed upon the need for maintaining disciplines in all sphere of life.

9. The Annual Function of the Scientific Society under the Council of Student's Activities was organized on 26thSeptember, 2018. Model, Poster & other competitions were organized on the

topic relating to “Water Conservation” and “Sustainability of Sugar Industry”. Dr. Sushil Solomon, Vice Chancellor, CSA University of Agriculture & Technology graced the occasion and distributed the prizes.


10. Annual Sports under the auspicious of Council of Student’s Activities were organized from 05th to 18thSeptember, 2018 at the Institute.Overall championship was won by:

Boys – KuldeepShukla (Sugar Tech. 2nd Year) Girls – Anjali Rajput – (Sugar Tech. 2nd Year)



11. “Vishwakarma Pooja” was organized in the Experimental Sugar Factory, Instrumentation Division & Agricultural Farm on 17thSeptember, 2018.



12. A special cleanliness drive "Swachhta Hi Sewa” was undertaken from 15th September to 02nd October, 2018 in and around campus. During the period, essay & painting competitions and NukkadNatak were also organized involving staff & students of the institute.



13. Meeting of experts committee for revision of existing Sugar Standards Grades for the season 2018-19 was held at NSI, Kanpur on 26thSeptember, 2018 under the Chairmanship of Director, NSI. Standards finalized& sales shall commence from 1stOctober 2018.**Details are available on our website http::/nsi.gov.in**



14. संस्थान में दिनांक 1 से 14 सितंबर, 2018 हिंदी पखवाड़ा मनाया गया तथा हिंदी दिवस पर पुरस्कार वितरण समारोह संपन्न हुआ।हिंदी पखवाड़ा के दौरान आयोजित विविध प्रतियोगिताओं में विजेता स्टाफ़ एवं छात्रों को पुरस्कार से नवाजा गया।

हिन्दी भाषी अधिकारी	**डॉ आशुतोष बाजपेई**
हिन्दी टिप्पण आलेखन प्रतियोगिता	श्री सन्तोष कुमार त्रिपाठी
हिन्दी निबन्ध प्रतियोगिता	श्री दयाशंकर मिश्रा
हिन्दी निबन्ध प्रतियोगिता (केवल एम.टी.एस. कर्मचारियों के लिए)	हरि नारायण मीना
हिन्दी टंकण प्रतियोगिता	श्री रमाकान्त
हिन्दी व्याख्यान प्रतियोगिता	श्री दयाशंकर मिश्रा
हिन्दी प्रचार-प्रसार प्रतियोगिता	श्री जाहर सिंह
हिन्दी सामान्य ज्ञान प्रश्नोत्तरी प्रतियोगिता	श्री राजीव कुमार
हिन्दी सामान्य ज्ञान प्रश्नोत्तरी प्रतियोगिता (केवल एम.टी.एस. कर्मचारियों के लिए)	श्री हरि नारायण मीना
हिन्दी व्याख्यान	श्री संतोष कुमार त्रिपाठी
हिन्दी निबंध (छात्रा)	सुश्री एकता यादव
हिन्दी निबंध (छात्र)	श्री शिखर मिश्रा

➢ OUR FELICITATIONS:

1. Institute got the "ABP News-National Education Leadership Award" for excellence in teaching and creating institute-industry interface.

2. During the 76thAnnual convention of Sugar Technologist's Association of India, **"Noel Deer Gold Medal"** for best research paper in by-product section has been awarded Prof. Narendra Mohan, Director and Dr. V.P. Srivastava, Asstt. Professor of Organic Chemistry of the institute.

3. Shri D. Swain, Prof. of Sugar Engineering was conferred with "ISGEC Gold Medal" for Excellence in Engineering during the 76thAnnual convention of Sugar Technologist's Association of India held at Indore.

4. During the Annual Symposium of the Bharatiya Sugar at Kolhapur, Mr. Mahendra Yadav, Junior Technical Officer of the institute was conferred with ***"Best Overall Performance in R&D of the Year Award- National Level***".

➢ OUR RESEARCH AREAS:

The Institute is actively involved in the collaborative endeavors with the sugar and allied industries for developing innovative techniques and technologies for improving the overall profitability of the sugar industry.

➢ RESEARCH:

The Institute during the period took up R&D work on the following:

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. Bio-fertilizer samples were made using three different carriers viz; Boiler ash, Potash rich ash and Activated charcoal.

2. Utilization of bagasse as dietary fiber - Study the characteristics of bagasse as a food supplement initiated. The raw bagasse sample was subjected to chemical analysis namely:

moisture, total ash, (carbonated and sulphated) total sugars, protein, hemi-cellulose and cellulose. The same will be repeated for confirmation.

3. Filter Cake to Bio CNG/Compressed -With an aim to utilize the press mud for production of Bio-CNG, different combinations of press mud, farm yard manure and spent wash were initially tried on laboratory scale.


A new set has been prepared by the use of 80% filter cake, 15% FYM with the combination of 5%culture prepared by the previous set-up for bio-gas production.Detailed study for finding the exact rate of biogas generation, gas generation per unit filter cake, scrubbing chemical requirement and quality of gas shall be made.

4. Studies on the feasibility of utilization of sugarcane bagasse as a potential feedstock to access cosmetic ingredients - Some preliminary work related to access the condensation product between xylose (pure) and acetyl acetone so as to have the authentic sample has been performed. The isolation and characterization of the products is 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 characterization of bagasse & trash derived products obtained during preliminary experimental

works performed in a proto type SS pot is under process.

6. Studies on Production/isolation of C5-Sugar Alcohol/Sugar using by-product resources of sugar industry-The studies aim basically at deriving a low-calorie sweetener from bagasse for which isolation of products formed during the optimization of the reaction conditions for the systhesis of xylitol from sugarcane trash has been completed. The isolated compounds are being analyzed for characterization.

7. Studies on pot efficient synthesis of alkyl levulinates (Als) using sugarcane bagasse derived cellulose – Biomass conversion into useful chemicals, materials and fuels emerged as a promising alternative toward replacing the current production of most of these commodities and specialty products from petroleum feedstocks. Alkyl levulinate (AL) is as useful as a levulinic acid derivative in many fields, such as medicines, solvent, organic chemistry, fragrance and furthermore it can be directly used as additives for gasoline and diesel, due to its excellent performances, such as high lubricity, flashpoint stability, non-toxic and better flow properties under cold condition. Based on such potential, direct production of alkyl levulinate (AL) from sugarcane bagasse in a catalytic cascade reaction will be evaluated following bio-refinery concept.

8. Mechanical Clarification of Juice - Literature survey is in progress. Based on the available information and with own perceptions, lab trials are being planned which will be carried out in Oct. /Nov. 2018.

9. Use of Brine reject in Final Molasses - Brine recovery and disposal of brine reject is an area of concern from environment angle. Such reject has been procured from some of the sugar refineries and analyzed. Brine reject was mixed in final molasses at 4% and 6% ratios and analysis of samples for fermentation efficiency of molasses is in progress.

10. Development of Super Short Retention Time Clarifier- Analytical data as a result of experiments conducted on a prototype at the Experimental Sugar Factory revealed turbidity and

colour reduction in the clear juice from the input mixed juice to be around 35% & 20% respectively. Work related to development of modified drawing & design for SSRT clarifier is in progress.

➢ RESEARCH PAPERS/ POSTER / PRESENTED / PUBLISHED/ SENT FOR PUBLICATION:

1. "Development of an Effluent Treatment Process for Plantation White Sugar Factories to meet CPCB Requirements" by Neelam Dixit, Amresh Pratap & Narendra Mohan published in the proceedings of 6th Annual Symposium of Bhartiya Sugar, held on 14-15th July 2018 at Kolhapur.

2. "Valorization of Sugarcane trash as a Potential Raw Material in Formulation of Eco-Friendly Liquid Detergent" by Narendra Mohan, Vishnu P. Srivastava and Anushka Agarwal published in the proceedings of 64th Annual Convention of The Deccan Sugar Technologists Association held on 28-29th July 2018 at Gandhinagar, Gujarat.

3. "Ethanol Production: Opportunities & Challenges" by Narendra Mohan published in the proceedings of 6th Annual Symposium of Bhartiya Sugar, held on 14-15th July 2018 at Kolhapur.

4. "Sugar Dust Explosion – A Case Study, Prevention & Protection" by Sanjay Chauhan & Jitendra Singh published in Sharkara in April-June 2018.

5."Isolation of Yeast Strain from Spoilt Sugarcane Juice" by Vinitanjali Banerjee,Santosh Kumar & Narnedra Mohan published in proceeding of 76thAnnual Convention of Sugar Technologist's Association of India held on 20th -22ndAugust 2018 at Indore.

6."Multi-Level Inverter based Topologies for Sugar Mill Drive Applications" by Anoop Kumar Kanaujia, Sanjiv Kumar & D. Swain published in proceeding of 76th Annual Convention of Sugar Technologist's Association of India held on 20th -22nd August 2018 at Indore.

7. "A Study on Working of Vertical Continuous Pan for Raw Massecuite Boiling" by Narendra Mohan, Ashutosh Bajpai and Subhash Chandra published in proceeding of 76thAnnual Convention of Sugar Technologist's Association of India held on 20th -22ndAugust 2018 at Indore.

8. "Clarification of Intermediate Process Liquors for Improvement in Sugar Quality" by Narendra Mohan, Dr. Ashutosh Bajapi & Mahendra Pratap Singh published in proceeding of 76th Annual Convention of Sugar Technologist's Association of India held on 20th -22ndAugust 2018 at Indore.

9. "Carbonation of Phosphotation Refinery: A Practical Approach" by Narendra Mohan, Mahendra Yadav & V.P. Singh published in the proceedings of one day seminar organized by NSI, Kanpur & Nirani Sugar Ltd on 15th September 2018 at Mudhol, Karnataka.

10. "Treatment of Sugar Factory Effluent by A Novel Process" by Amresh P. Singh, Mahendra Kumar Yadav & Narendra Mohan published in proceedings of National Seminar held at Belagavi, Karnataka.

11. "**Effluent Generation & Treatment in Indian Sugar Industry"** by Mahendra K Yadav, J.P. Srivastava & Narendra Mohan published in proceedings of National Seminar held at Belagavi, Karnataka.

➢ BUREAU OF SUGAR STANDARDS:

The Institute on behalf of Bureau of Indian Standards prepares and issues Sugar Standard Grades to the entire Sugar Industry of the country for every sugar season. These Sugar Standard Grades are issued to facilitate quality control and to protect the interest of the common consumers. On the basis of these grades, sugar factories mark their produce accordingly.

On the basis of the approved Standards, Bureau of Sugar Standards Grades distribution commenced from 1st October, 2018.

Price schedule for the sugar season 2018-19:

1	Sugar Standard Grades to be issued	L-31, L-30, M31, M-30, S-31,S-30 & SS-31
2	Set of New Sugar Standard Grades containing 7 grades +3 empty glass bottles + 3 Velvet Cork in packing case	Rs.15000/= each set
3	Single Sugar Standard Grade	Rs.1900/= each
4	Empty Sugar Standard Glass Bottle	Rs.325/= each
5	Packing case	Rs.485/= each
6	Velvet Cork	Rs.80/= each
7	Postal expenses, forwarding charges, if any	Extra as applicable
8	Demand Draft to be sent	In favour of **Director, National Sugar Institute,** payable at Kanpur
9	Delivery of Sugar Standard Grades	Monday to Friday (10.00 AM to 5.00 PM)
10	Taxes	GST extra as applicable @18%. See SSOP on our website http://www.nsi.gov.in

➢ OUR ADVISORY:

Besides conducting teaching and training programmes, carrying out research in relevant field, another main function of the institute is:

1. To function as a "Think-tank" to sugar and allied industry for proposing modernization and trouble free functioning of the process on advisory basis / through Extension Services.

2. To formulate strategies and promotes measures for expansion of capacities, energy conservation, co-product utilization etc. for sugar and allied industries.

3. To assist Govt. of India through technical contribution in policy formulation and control of Sugar Industry.

➢ CONSULTANCY SERVICES:

During July-September, 2018 consultancy services were provided to the following:

1	M/s The Kisan Sahakari Chini Mills Ltd., Anoopshahr, Distt.- Bulandshahr, U.P.
2	M/s DSCL Sugar, Hariawan, Distt.- Hardoi, U.P.
3	M/s Chadha Sugars & Industries Pvt. Ltd., Batala, Distt – Gurdaspur, Pubjab.
4	M/s The KisanSahakari Chini Mills Ltd., Satha, Distt.- Aligarh, U.P.
5	M/s The Kisan Sahakari Chini Mills Ltd., Kayamganj, Distt.-Farukkhabad, U.P.
6	M/s Kisan Sahakari Chini Mills Ltd., Nanauta, Distt.-Saharanpur, U.P
7	M/s SarjooSahakari Chini Mills Ltd., Belrayan, Distt.-Lakhimpur-Kheri, U.P.
8	M/s The Ganga Kisan Sahakri Chini Mills Ltd., Morna, Distt.-Muzaffarnagar, U.P.
9	M/s Rudra-BilasKisanSahakari Chini Mills Ltd., Bilaspur, Distt.-Rampur, U.P.
10	M/s Shravasti KisanSahakari Chini Mills Ltd., Nanpara, Distt.-Bahraich, U.P
11	M/s Bisalpur Kisan Sahakari Chini Mills Ltd., Bisalpur, Distt.-Pilibhit, U.P.
12	M/s The Kisan Co-operative Sugar Factory Ltd., Sarsawa, Distt.-Saharanpur, U.P.
13	M/s HPCL Lauria, Distt.-West Champaran, Bihar.
14	M/s Harinagar Sugar Mills Ltd., Harinagar, Distt.-West Champaran, Bihar.
15	M/s The Kisan Sahakari Chini Mills Ltd., Mahmudabad (Oudh), Distt.-Sitapur, U.P.
16	M/s The Kisan Sahakari Chini Mills Ltd., Distt.-Badaun, U.P.
17	M/s Sri Malaprabha Sahakari Sakkare Karkhana, Belagavi, Distt.-Belagaum, Karnataka.

18	M/s U.P. Co-operative Sugar Factories Ltd., Lucknow, U.P.
19	M/s The Haryana Co-operative Sugar Mills Ltd., Bhali, Anandpur, Distt – Rohtak.
20	M/s The Kisan Sahakari Chini Mills Ltd., Gajraula, Distt – Gajraula, U.P.
21	M/s The Sahabad Co-operative Mills Ltd., Sahabad, Distt – Kurukshetra, Haryana.
22	M/s The Bagpat Co-operative Sugar Mills Ltd., Distt – Bagpat, U.P.
23	M/s The Kisan Sahakari Chini Mills Ltd., Tilhar, Distt – Shahjahanpur, U.P.
24	M/s Kisan Sahakari Chini Mills Ltd., Powayan, Distt – Shahjahanpur, U.P.
25	M/s Kichha Sugar Mills Ltd., Kichha, Distt – Nainital, Uttarakahnd.
26	M/s Kisan Sahakari Chini Mills Ltd., Semi-Khera, Distt – Bareilly, U.P.
27	M/s SAB Miller India Limited Central Distillery & Brewery Office, Kankarkhera, Meerut, U.P.
28	M/s Doiwala Sugar Company Ltd., Doiwala, Uttarakhand.
29	M/s Dalmia Sugar Mills Ltd., Nigohi, Distt – Shahjahanpur, U.P.
30	M/s The Kisan Sahakari Chini Mills Ltd., Puranpur, Distt – Piliphit, U.P.
31	M/s Ramala Sahakari Chini Mills Ltd., Ramala, Distt – Bagpat, U.P

➢ ANALYTICAL SERVICES:

The institute now has a Centralized NABL Accredited Analytical Laboratory to carryout analysis of sugar, molasses, alcohol and other related products as ICUMSA and other standards protocol. During the period, analytical services were rendered to following:

1	M/s The Nakodar Co-op Sugar Factory Ltd., Nakodar, Distt- Jalandhar, Punjab.
2	M/s The Seksaria Biswan Sugar Factory Ltd., Distt- Sitapur, U.P.
3	M/s The Ajanala Co-operative Sugar Mills Ltd., Ajanala, Distt- Amritsar, Punjab.
4	M/s Sarjoo Sahakari Chini Mills Ltd., Belrayan, Distt – Lakhimpur-Kheri, U.P.
5	M/s Ramala Sahakari Chini Mills Ltd., Ramala, Distt – Bagpat, U.P.
6	M/s Kisan Sahakari Chini Mills Ltd., Nanauta, Distt – Saharanpur, U.P.
7	M/s The Ganga Kisan Sahakari Chini Mills Ltd., Morna, Distt – Muzaffarnagar, U.P.
8	M/s Shravasti Sahakari Chini Mills Ltd., Nanpara, Distt – Bahraich, U.P.
9	M/s Kisan Sahakari Chini Mills Ltd., Puranpur, Distt – Pilibhit, U.P.

➢ **RESEARCH ARTICLE:**

"REVIEW - REMOVAL OF SUSPENDED FINE PARTICULATE MATTER FROM RAW JUICE PRIOR TO ITS PROCESSING"

by

K Jagadeesh, R W Patil and Dhairyashil Patil
J P Mukherji & Associates Pvt. Ltd., Pune

INTRODUCTION:

Raw juice extracted in the milling tandem contains many colloidal and suspended particles. Sand, soil and fine bagacillo particles are the major ones. Because of the increased crushing capacities of mills, sugarcane has to be drawn from faraway fields, compromising the cane quality which results into higher proportion of soil and sand. Mechanical harvesting, higher cane preparation and imbibitions are also the other factors contributing to higher values of suspended matter, mainly fine bagacillo particles.

Honig[i] reported that the suspended matter percentage of non-sugars, varies between 1 and 10%. Recent studies[ii] confirms that during the last one decade, due to increased PI values, dust formation is taking place and there is about 40% increase in suspended fibre content in screened mixed juice.

Presently, in Indian sugar industry, DSM screens of 0.70/0.50 mm slot opening and rotary screens with 0.35-0.50 mm opening are in use for screening of mixed juice. With these configurations, the normal values of suspended matter in screened juice are generally around 0.15 to 0.30 % on cane. These particles, if not removed, pass on to subsequent stages of the manufacturing process and sometimes even visible in the final product. For minimising this, presently some of the units have started adopting clear juice screening also. But this is not advisable from the point of improvement in juice clarification, filtration and heat loss. Thus, removal of these residual suspended particles prior to the clarification of juices is always advantageous for improving process efficiency and colour reduction.

Douwes Dekker and Laubscher studied the effect of removing of bagacillo from mixed juice[iii], using Peck screens made up of 80 mesh and link belt vibrating screens of 60 by 40 mesh. The average bagacillo removed was around 65%. It was observed by the authors that

without above screening, there was huge accumulation of bagacillo in troughs bringing the juice from Sulphur tower to tempering tanks, the loss in filter cake was higher, sucrose lost in final molasses was almost 20 % higher with unscreened juice.

Our industry, had also witnessed limited industrial as well as laboratory level trials with respect to maximum removal of fine suspended particles from raw juice. Cane juice centrifugation, Hot raw juice screening and Cold raw juice filtration are some of the examples. In this paper, a general review of such trials/studies is being summarized with an aim to highlight importance of such fine particulate removal on process operations. It is also to help our technologists in judicious assessment of their role for improving the process efficiency as well as quality of the final product.

The following are the three options reviewed in this article;

- Cane Juice Centrifugation
- Hot Raw Juice Screening
- Cold Raw Juice Filtration

The discussions, data and opinion given hereunder by the authors of this article are based on the published and unpublished work and also the analytical studies independently carried out by them at various locations. Cost benefit comparison of these technologies is not part of this review.

1. CANE JUICE CENTRIFUGATION:

Centrifugals are used widely in the sugar industry for separation of sugar crystals and mother liquor from massecuites. However, very little work related to centrifugation of raw cane juice was reported. Honig opined that on centrifugation of juice, the practical effect on the volume of muddy juice, quality of the filtered juice are of no significance and also that the removal of the finely suspended matter had diminishing effect on the filterability of the mud juices.

Ram Kumar *et. al*[iv]*.,* conducted studies by centrifuging mixed Juice in a lab centrifuge at 2000 g. Various parameters like wet mud quantity, viscosity reduction, ash and colour removal etc., were monitored. Their studies revealed;

- Mud separation is about 5% on wet basis and around 1.5 % on dry basis
- Negligible effect on Temperature, pH and Purity of juice

- 3 % less milk of lime quantity in case of centrifuged juice for raising the pH of juice from 4.9 to 9.0.
- Ash% mud is around 11%.
- Reduction of approximately 20 ± 5% in relative viscosity was observed in centrifuged juice, as compared to non-centrifuged juice.
- As regards to ICUMSA colour of juice, a reduction of about 20% was observed in centrifuged juice, which is quite nearer to the ICUMSA colour value of clear juice of that factory.

The authors of these studies are of the opinion that;

- Separation of suspended solids in cold stage will avoid dissolution of suspended and other impurities and thus it will have an advantageous impact on clarification.
- Reduction of scales as well as viscosity in juice heater and evaporator tubes.
- Reduction in mud volume will reduce the load on clarifier and vacuum filter.
- Better homogenous reaction between juice and milk of lime, as a result of suspended matter separation, is the reason for reduction in milk of lime quantity.
- The reduction in the filterability of the mud, can be overcome by use of polymers and improved cloths, as per the authors.
- Removal of considerable quantity of ash may lead to a change in the quality of scales in juice heaters.
- Elimination of dirt correction related measurement errors in chemical control.

Studies on Hot raw juice centrifugation were carried out by Jain *et. al*[v]*.,* by centrifuging mixed juice heated to 65^0 C. The effect on relevant parameters like transmittance, sulphated ash, conductivity, surface tension, etc., was monitored for the juice before and after centrifugation.

Their studies gave encouraging results;

- The clarity of the treated juice as measured by its transmittance was comparable with that of the clear juice of the factory, obtained by regular processing.
- Increase in apparent purity values
- There was about 8-10 % (v/v) reduction in milk of lime quantity to bring the pH of the juice from 5.5 to 9.0 pH
- There was noteworthy reduction in Sulphated ash and increase in conductivity values.

The above referred studies broadly confirms that, on centrifugation of juice prior to its chemical treatment, there will be significant improvement in the colour/transmittance, reduction in ash content, mud volume, chemical dosage and also lesser scale deposition etc.

Even though, cane juice centrifugation guarantees improved working results, however, practical factory level trials are not yet taken up by the industry. This may be due to non-availability of suitable equipment, higher power consumption, probable maintenance costs etc., which outweigh the possible benefits of this technology. However, these laboratory scale studies clearly throw light on the importance of suspended matter removal for efficiency of process operations.

2. CANE JUICE FILTRATION:

In the recent past factory level adoption of **Two** relatively new technologies has taken place for separation of suspended particulate matter. They have been introduced by their respective technology providers as **"Hot Raw Juice Screening"** and **"Raw Juice Filtration"**.

2.1. Hot Raw Juice Screening:

Hot raw juice screening is a recent development reported to be running in about **Nine** sulphitation plants. It is installed near juice sulphiter station. Hot raw juice from SO_2 absorption tower of juice sulphiter is diverted to the inlet pipe of rotary screen and screened hot raw juice is returned back to the juice sulphiter by gravity. The bagacillo and other suspended matter separated from the screen are collected in a receiving tank and transferred to either mills or the mud mixer of vacuum filter. A typical flow diagram of the system is given at Fig. No. 1.

Major portions of the screening unit are in enclosed condition, to avoid heat loss across the screening. Its working screen, backing screen, feed end, discharge end and other juice discharge parts are all made of SS construction. The screening area comprises of stainless screen with an opening of 150 microns and it is supported by perforated stainless steel rotary drum.

As per the analytical results published[vi, vii], there is about 90% removal of fibrous particles. The following are the reported results of its working at various installations.

- Reduction of Clear Juice colour and turbidity
- Additional separation of 0.15 to 0.165% cane of dry fibre for extra power generation
- Lowest ever fibre in screened hot raw juice ie., 0.02 - 0.03 % juice
- No fibre contamination of sugar crystal.
- Chocking at sulphited juice PHE is eliminated
- Reduced solid and colour loading on subsequent process of juice, syrup and melt clarification.

- Increase in capacity of existing Clarifier and Vacuum filter/Decanter due to reduced solid loading.
- Improvement in sugar colour by about 10 - 15 IU in normal condition and 15-20 IU in favorable conditions.
- The white sugar produced has always tested 'negative' to the beverage floc test
- The sedimentation test for white sugar has shown average value of 30 mg/kg; much below to the desired norm prescribed by beverage industry.

In addition to above observations, Joshi also reported that weekly analytical tests conducted across hot juice screening over a period of one month in three of their installations (Fig No. 2 & 3 and Table No. 2 & 3), indicated fibre content removal of around 90% and colour removal of about 11 %, on an average.

2..1.1.Studies Conducted By Authors:

It is evident from the above discussed studies & trials that, in addition to colour removal, suspended particulate removal from mixed juice either by centrifugation or by screening is more than 90%. Observations are also recorded regarding reduced loads of settled muds. For assessing the role of hot raw juice screening especially on mud formation and colour removal, few laboratory tests were conducted by us at one of the installations in Maharashtra, results and observations of which are shared hereunder.

2..1.2.Brief Description of the System working:

The factory has installed 2.0 m dia X 4.0 m length hot raw juice rotary screen in the year 2016 and was having 3 decanters of Sugar Dec – 400 type and 2 vacuum filters of 8' x 16' size. The crushing rate of the factory was 205 - 220 TCH and before installation of hot rotary screen, it was running decanters along with one of the rotary vacuum filters as and when required. However, after the installation of hot raw juice screen in season 2016-17, the factory was comfortably operating with the existing decanters only for the same crush rate. The temperature drop across rotary screen was observed to be less than 1^0C. The separated bagacillo is mixed with 2nd centrate from Decanters to form slurry and is then pumped to mills.

Broad details of the installed juice screening system are given at Table No. 4.

2..1.3.Materials and Methods:

- Spot samples of hot raw juice at around 72-75^0 C, before and after its screening, were collected for ICUMSA colour determination, settling tests at shock pH, moisture %

bagacillo, ash % bagacillo etc. Analyses of 2-3 repeat sets of sampling were done for various parameters.

- Colour measurement was by method GS 1/3-7. Parallelly, colour measurement of screened and unscreened juice was also done at their original pH without adjusting to 7.0 pH.
- The moisture% of bagacillo separated from hot raw juice was measured by Method GS7-5 and its sulphated ash percentage by GS1/3/4/7/8-11.
- For undertaking settling tests in glass cylinders, measured quantity of milk of lime of around 6-7^0 Be @11 gms per 550 gms of juice was added to hot raw juice samples of around 72-75^0 C, collected before and after the screen. Volume of the mud settled in the so defecated juice was noted down at definite time intervals. Such tests were separately conducted with 30 min, 45 min and 60 min settling time.
- The volume of mud settled and ICUMSA colour values of supernatant clear juice of both unscreened and screened samples were measured.

2..1.4. Results and Discussions:

The results of our analysis are tabulated at Table Nos. 5 to 8 and graphical representation of the observations given at Fig No. 4, 5 and 6.

It can be observed from the analytical data that;

- The colour reduction with the screening, as measured at the original pH of the juice is around 6.8 -12 %
- The colour reduction with the screening of juice, as measured by method GS 1/3-7, is also almost same ie., around 7.0 - 11.7%.
- These results confirm that there will be reduction in colour values of clear juice with the separation of suspended matter.
- The ash % and moisture % of the wet bagacillo separated at the hot raw juice screen are around 0.50 % and 80 % respectively.
- The mud volume as measured in the shock limed, screened juice is about 8 - 10% less, compared to the mud volume of unscreened, limed juice. This clearly confirms that mud loads at clarifier and filter, in case of hot raw screening will be definitely reduce.
- It could also be observed from the analytical data at Table No.7 that, the difference in colour between screened and unscreened shock limed juice is around 4 % only. This may be due to alkaline condition of juice for higher duration during settling trials.
- As regards to the comparison of the settling rates of both unscreened and screened juices (Fig. No. 6), it can be seen that mazor difference in the mud volumes of both unscreened and screened juices has completed in the first 15-30 minutes only. This

trend indicates that, for achieving same level of settling, lower retention time in clarifier is adequate with this screening system.

Hot raw juice screening system is a recent development which is running successfully in many units. The noteworthy benefits of the system as experienced and observed in many of the installations are, colour and turbidity reduction of juice as well as final product, less mud volume etc., apart from many other benefits in the quality and working of downstream products/units.

Presently, in case of factories with vacuum filter system, bagacillo is sent to muddy juice receiver. Whereas in those factories which have installed decanters, the bagacillo separated in the hot raw juice screening is pumped to milling tandem in slurry form by mixing 2nd stage Centrate.

Keeping in view the possible benefits of suspended matter separation on process operations, hot raw juice screening appears to be a promising technology.

However, issues like; its installation cost, disposal of separated bagacillo to mills/ vacuum filter, life of the screen etc., are the points generally expressed by the users which need to be further evaluated and addressed properly.

2.2. Raw Juice Filtration:

Unlike Hot Raw Juice Screen, the Raw Juice Filtration System[viii],[ix] is meant for screening of suspended matter from cold raw juice obtained from the Rotary /DSM screen of milling station. It is installed in the milling section only as against the juice sulphiter station in case of Hot Raw juice screen.

As per the product literature distributed by its manufacturer, this system comprises of hollow cylindrical drum with 100 mesh SS screen on its peripheral surface and 32 micron, SS 316 L quality membrane in the inside. The drum rotating on its horizontal axis partially submerges in the trough containing the juice to be screened.

The manufacturer of the system mentioned that raw juice in the tray is sucked by gravity flow, first through the perforated screen on the surface of the drum followed by inside membrane by draft creation process. Further details of the membrane system are not disclosed by the manufacturer. Filtered juice is sent to clarification process and the separated bagacillo is diverted to the mills.

It is reported[x] that the system has completed its factory scale trials successfully at Dhanalakshmi Sugars Pvt Ltd., TN.

The following are the results reported by the manufacturers;

- Reduction in colour by 11 %
- Bagacillo separation is more than 90%
- Reduction in clear juice turbidity is 5 %
- Increase in the transparency of clear juice by 12 %
- Capacity increase in vacuum filter
- Chocking of pumps, heating surfaces of juice heaters, pipelines eliminated
- No presence of bagacillo in final sugar
- Reduction in sugar colour by 15-20 units

The above discussed "Raw Juice Filtration System" is cold juice filtration as against hot raw juice filtration, discussed in earlier paragraphs. It is claimed by the manufacturer that due to specially developed SS membrane screen, bagacillo particles of above 32 micron size are separated by this system, as against 150 micron size particle separation in hot raw juice system.

The working results of the cold raw juice filter as reported by the technology provider with respect to bagacillo removal, colour and turbidity reduction, sugar colour reduction etc., appears to be almost identical or slightly higher than the working results of hot raw juice screening. Its location of installation ie., milling station, is also advantageous in terms of bagacillo handling and disposal.

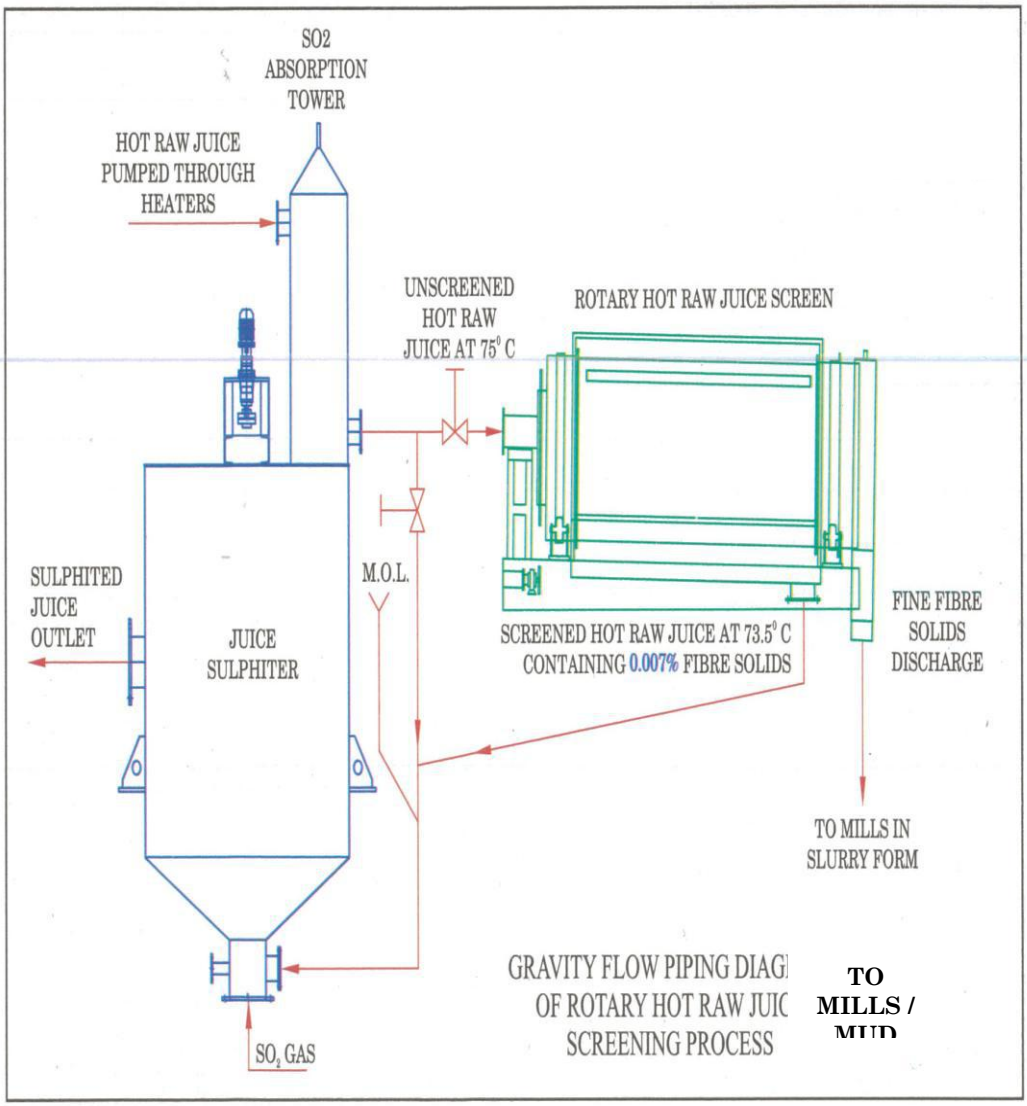
However, since it is reported to be working in only one unit, its performance results needs to be independently evaluated by multiple users. Doubts related to its chocking, cleaning intervals & procedure, membrane life/maintenance, screening area requirement etc., also needs further clarification.

CONCLUSION:

Due to ever increasing cane preparation and mill extractions, poor cane quality etc., the quality of mixed juices obtained in our sugar mills is being badly affected. For producing better quality sugar, suspended particulate removal is very much essential. Studies related to the three types of options reviewed in this article clearly confirm that the benefits of such removal are not limited to colour and mud solid reduction only. There are additional advantages like viscosity reduction, slightly lower lime consumption, lesser scale formation, non chocking in juice

heaters, improved quality of final sugar, capacity enhancement, especially in clarifier and vacuum filter etc. In the current scenario of low sugar prices, most of the units may be cautious in going for extra investment immediately. However, in view of their advantages, we are confident that, in the coming years the industry will definitely embrace these technologies on the basis of their individual merits.

Fig. No. 1: Typical Flow Diagram of Hot Raw Juice Screening System



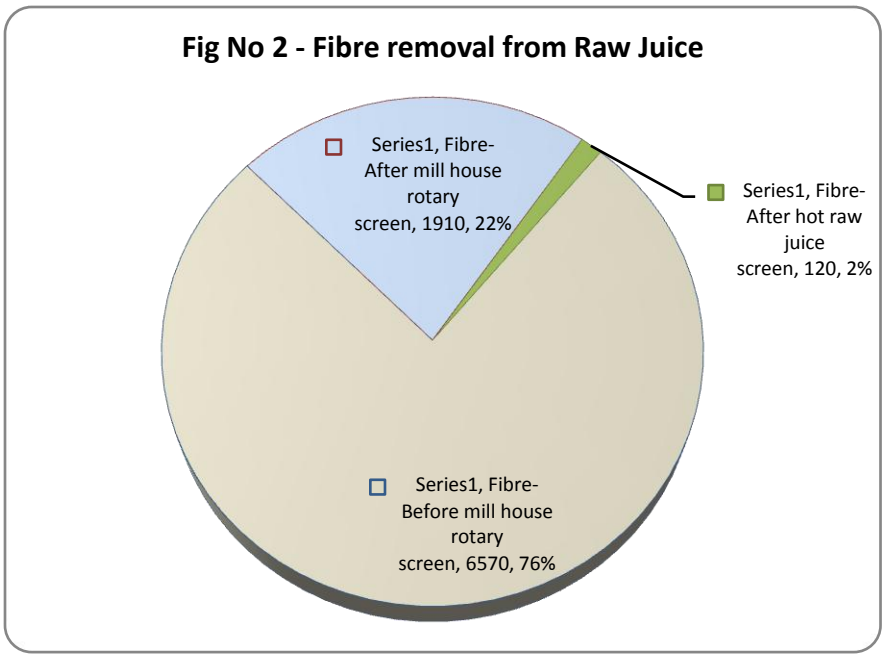


Fig No 2 - Fibre removal from Raw Juice
Series1, Fibre- After mill house rotary screen, 1910, 22%
Series1, Fibre- After hot raw juice screen, 120, 2%
Series1, Fibre- Before mill house rotary screen, 6570, 76%

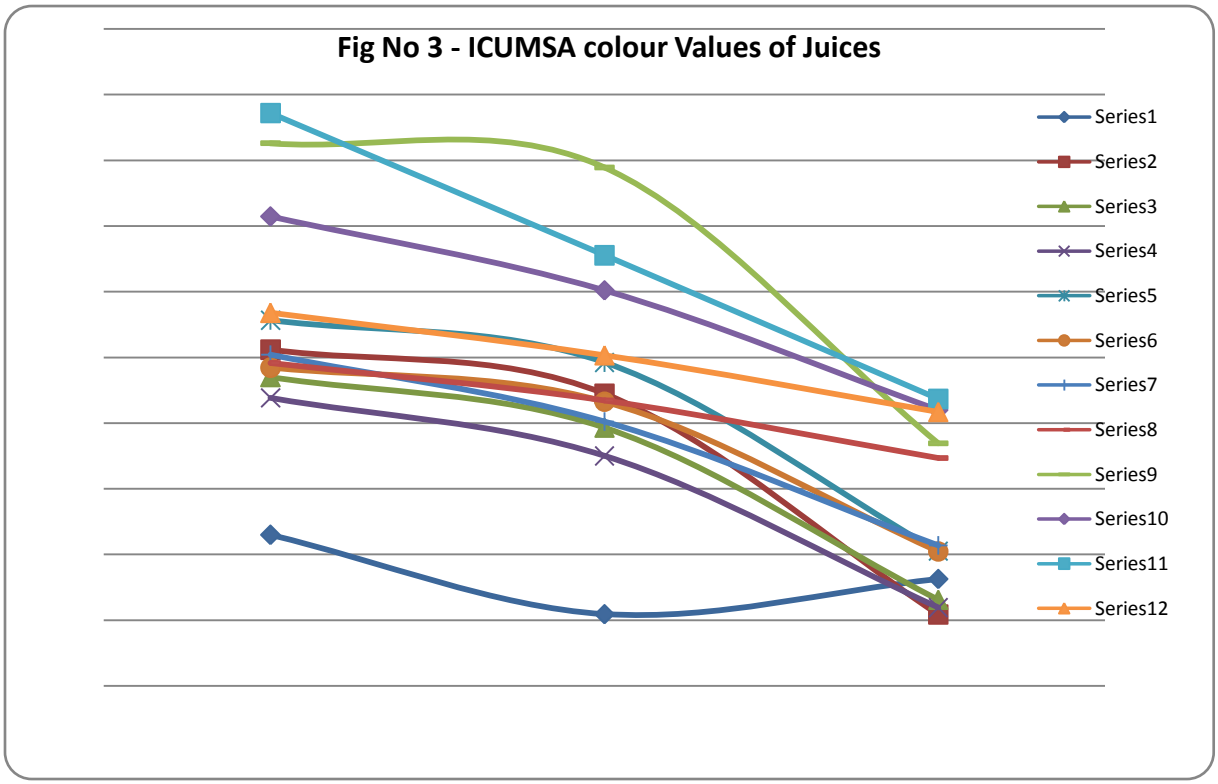


Fig No 3 - ICUMSA colour Values of Juices
Series1
Series2
Series3
Series4
Series5
Series6
Series7
Series8
Series9
Series10
Series11
Series12

Fig No 4 : ICUMSA Colour values of Unscreened and Screened Juice at its Original pH and pH adjusted to 7.0

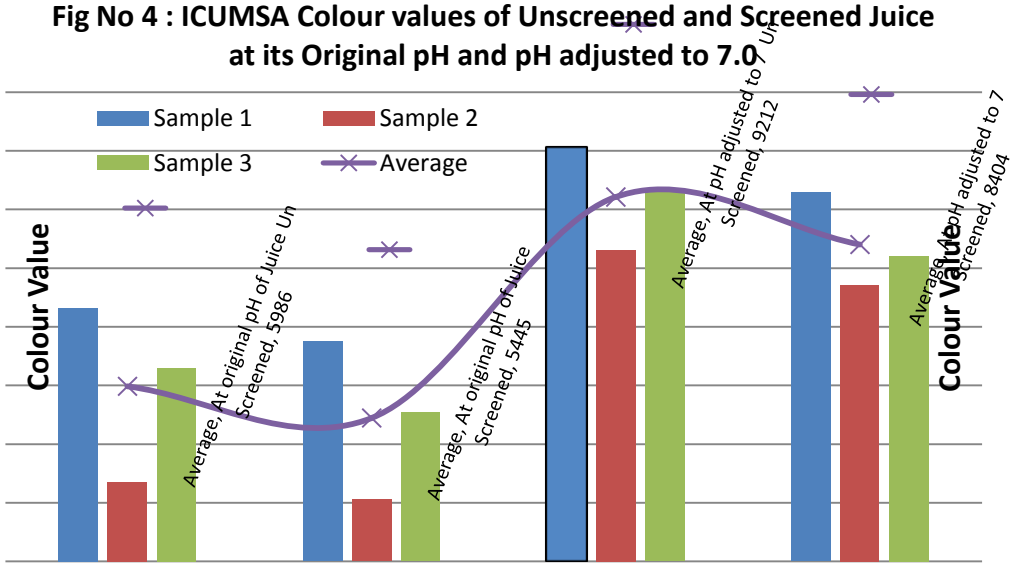


Fig No 5: Volume of Setteled Mud in Unscreened and Screened Shock Limed Juice

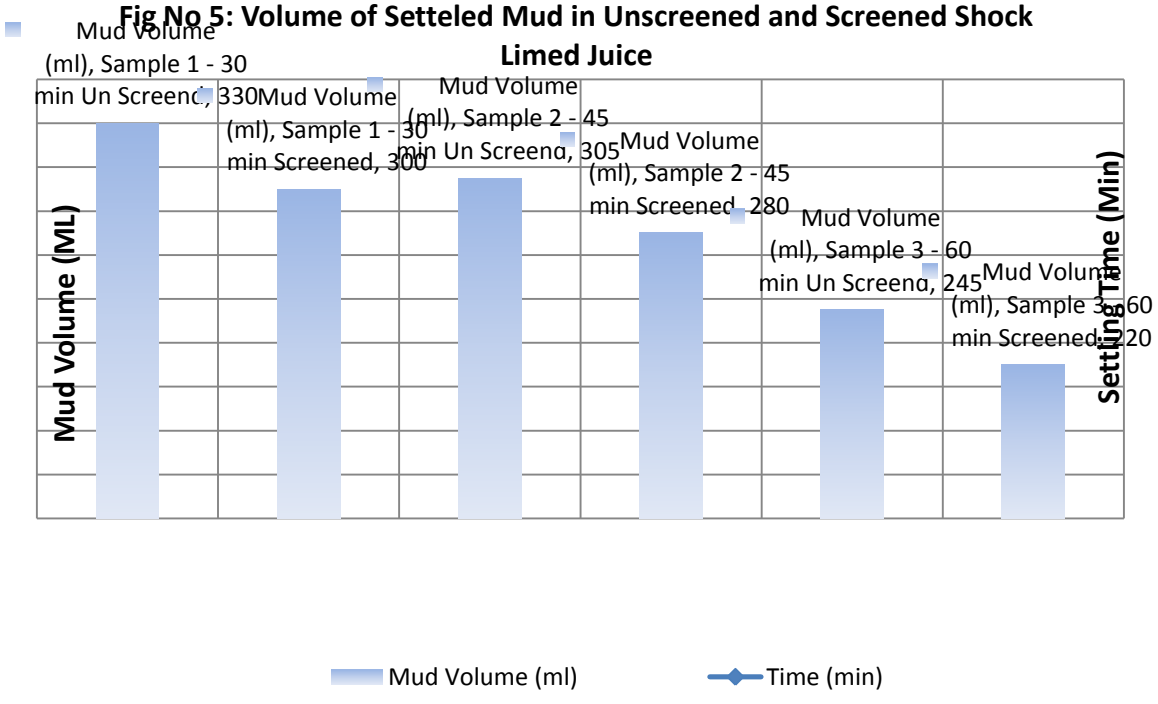


Fig. No - 6: Settling Profile of Limed Unscreened & Screened Juice at different time intervals

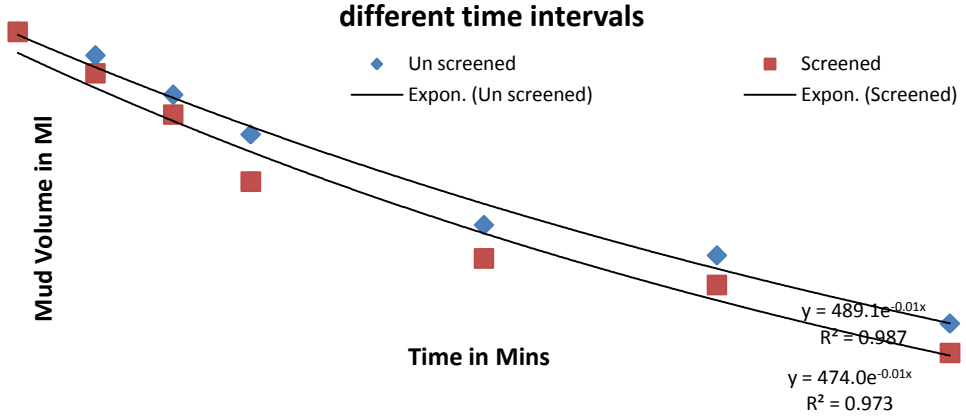


Fig. No - 7: Line Diagram of Cold Raw Juice Filter System

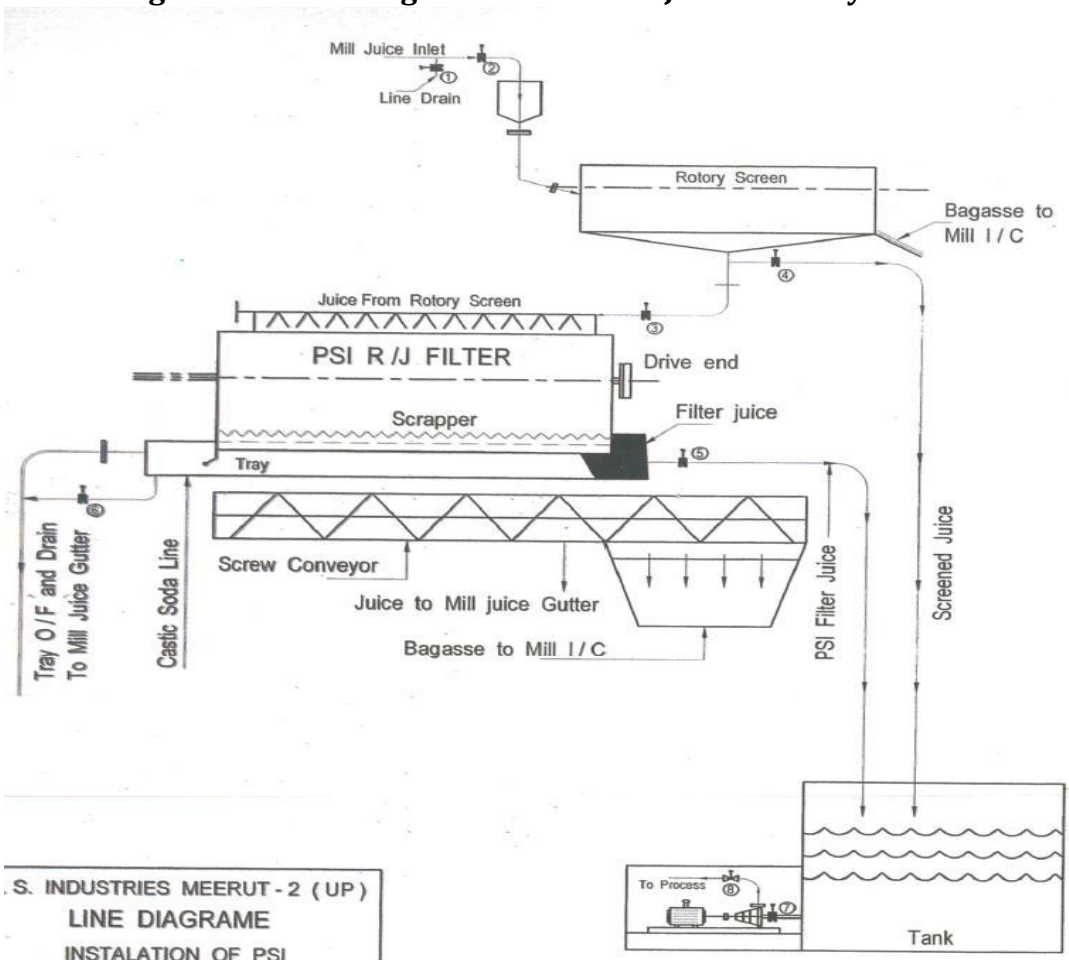


Table No: 1 – Results of Lab scale studies on Cane Juice Centrifugation

S. No	Measured parameter	Unit	Value
1	Wet mud separation	% (w/w)	5
2	Moisture % Wet mud	% (w/w)	75
3	Ash % of separated mud	% (w/w)	11.00
4	Ash % of centrifuged juice	% (w/w)	0.11
5	Viscosity reduction	%	15
6	Reduction in MOL requirement	% (v/v)	3

Table 2 – Fibre content in Juice before and after screening (ppm)

	s				Shree Chhatrapati Shahu SSK Ltd				The Sanjivani (Takli) S.S.K. Ltd.				Avearge	% removal
Fibre-Before mill house rotary screen	6570	8920	7130	7248	11145	8269	10480	12000	6954	8236	9024	8194	8681	
Fibre-After mill house rotary screen	1910	1850	2290	2196	2145	1852	2078	2292	1647	1942	1868	2250	2027	76.7
Fibre-After hot raw juice screen	120	190	228	198	224	232	187	197	208	218	193	226	202	90.0

Table 3 – Colour Removal in Juice before and after screening (IU)

	M/s. Krantiagrani Dr. G.D. Bapu Lad SSK Ltd				Shree Chhatrapati Shahu SSK Ltd				The Sanjivani (Takli) S.S.K. Ltd.				Average	% removal
Colour-Before hot raw juice screen	9593	15237	14403	13771	16133	14691	15083	14826	21520	19296	22443	16357	16113	
Colour-After hot raw juice screen	7185	13895	12865	12001	14845	13654	13048	13690	20784	17044	18110	15065	14349	10.9
Colour-Clear Juice	8255	7174	7618	7382	9101	9090	9278	11940	12382	13401	13734	13340	10225	28.7

Table No: 4 – Details of Hot Raw Juice Screening System

S. No	Particulars	Units	
1	Rotary screen at Milling Tandem		
	Dia	mm	2400
	Length	mm	4000
	Slot Opening	mm	0.45
	Drive	KW	11
2	Hot Raw Juice Screen		
	Dia	mm	2000
	Length	mm	4000
	Slot Opening	mm	0.150
	Drive	KW	11

Table No: 5 – Details of Colour Removal

S. No	SET	Sample		IU	% reduction
1	SET-1	Juice without Liming	Un-screened	12593	
2	SET-1	Juice without Liming	Screened	10123	19.610
3	SET-1	Juice after Liming	Un-screened	14483	
4	SET-1	Juice after Liming	Screened	13387	7.561
5	SET-2	Juice after Liming	Un-screened	24152	
6	SET-2	Juice after Liming	Screened	22925	5.080

Table No: 6 – Effect on Colour of Juice at Natural pH and 7.0 pH

S. No	SET	Sample		Sample pH	IU	% reduction
1	**SET-1**	Juice Original pH	Un-screened	5.83	7315	
2	**SET-1**	Juice Original pH	Screened	5.87	6746	7.774
3	**SET-1**	Juice at 7.0 pH	Un-screened		10044	
4	**SET-1**	Juice at 7.0 pH	Screened		9292	7.487
1	**SET-2**	Juice Original pH	Un-screened	5.36	4349	
2	**SET-2**	Juice Original pH	Screened	5.45	4053	6.818
3	**SET-2**	Juice at 7.0 pH	Un-screened		8303	
4	**SET-2**	Juice at 7.0 pH	Screened		7716	7.071
1	**SET-3**	Juice Original pH	Un-screened	5.56	6293	
2	**SET-3**	Juice Original pH	Screened	5.56	5535	12.042
3	**SET-3**	Juice at 7.0 pH	Un-screened		9290	
4	**SET-3**	Juice at 7.0 pH	Screened		8204	11.687

Table No: 7 – Mud Volume on Shock Liming

S. No	SET	Sample	Settling Time	pH of supernatant Juice	Mud Volume		ICUMSA Colour	
					ml	% reduction	IU	% reduction
1	**SET-1**	Un-screened	**60 min**	10.07	**245**		5634	
2	**SET-1**	Screened	**60 min**	10.20	**220**	10.20	5463	3.040
1	**SET-2**	Un-screened	**45 min**	10.07	**305**		5008	
2	**SET-2**	Screened	**45 min**	10.20	**280**	8.20	4778	4.605
1	**SET-3**	Un-screened	**30 min**	10.40	**330**		22936	
2	**SET-3**	Screened	**30 min**	10.48	**300**	9.09	21930	4.387

Table No: 8 – Ash and Moisture % of separated matter

	Ash %	Moisture %
Sample-1	0.52	79
Sample-2	0.38	82
Sample-3	0.62	80
Average	**0.51**	**80.33**

➢ HAPPENING IN THE SUGAR INDUSTRY:

Govt will only provide subsidy to mills that export sugar: Ram Vilas Paswan.

India will only provide financial assistance to sugar mills that export the sweetener, Food Minister Ram Vilas Paswan told reporters on Thursday. India's production will outstrip local demand and we will ensure all mills export the sweetener, Paswan said on the sidelines of the Globoil India conference.

India's Rs 5,500-Crore Sugar Package Will Add to Global Glut.

India's third incentive for sugar mills in four months is expected to add to the global glut even as prices have tumbled to their lowest in a decade because of excess supply this year. The cabinet on Wednesday approved aRs 5,538-crore package for the sugar sector to deal with the excess production.

Ethanol: Coming year may see 20-cr-litre capacity addition, says Food Secretary.

A spate of policy measures undertaken by the government in recent months will help increase production of ethanol for the fuel blending programme and a capacity addition of around 20 crorelitres is expected within a few months, said a senior official at the Department of Food and Public Distribution.

Maharashtra millers to increase raw sugar exports.

Sugar producers from Maharashtra are gearing up to maximise exports of raw sugar in the first two months of the crushing season, even as ICE futures plunged to a decade low on Wednesday after India announced mandatory exports of 5 million tonnes of the sweetener.

UP govt to provide soft loans to sugar mills.

The UP Cabinet on Tuesday gave the green signal for providing financial assistance of Rs 4.50 per quintal for purchase of sugarcane done in the 2017-18 season, which would directly go to the accounts of farmers against the pending payment.

Sugar stocks trade mixed; Gayatri Sugars, Piccadily Sugar jump 5%.

Sugar stocks were trading mixed during Wednesday's session in the wake of media reports that the Cabinet is likely to consider Wednesday the Rs 4,500 crorepackage for the cash-starved sugar sector.

Cabinet okaysRs 4,500-cr package to sugar industry.

The government Wednesday approved aRs 4,500 crore package for the sugar industry that includes over two-fold jump in production assistance to cane growers and transport subsidy to mills for export up to 5 million tonnes in the marketing year 2018-19, sources said.

Maharashtra to begin sugarcane crushing season from October 20.

The Maharashtra government has decided to commence the 2018-19 sugarcane crushing season early from October 20 as the area under sugarcane has increased than normal. “This is a good decision as there is surplus cane in many districts.

Yogi sets Nov 30 deadline for sugar mills to settle dues of Rs 86 bn.

Uttar Pradesh chief minister Yogi Adityanath on Tuesday set November 30 as the deadline for private sugar millers to settle cane dues of more than Rs 86 billion for the 2017-18 crushing season.

Mills must produce raw sugar for now: Traders tell Maharashtra.

With international sugar prices ruling at a decade’s low due to surplus supplies, sugar millers from Maharashtra have asked the state government to make it mandatory for millsNSE -6.09 % to produce raw sugar during the first two months of the crushing season beginning October 1.

Govt urged to re-open Chagallu sugar factory.

AP Sugarcane Farmers’ Association vice-president Undavalli Krishna Rao demanded that the state government take steps to reopen the Chagallu sugar factory. He participated in regional meeting of AP RytuSangham here on Sunday.

Sugarcane worth Rs 4 lakh gutted.

A major fire broke out in a sugarcane field at the foothills of Yercaud, on the outskirts of the city on Saturday, damaging half of the standing crop. According to landowner S Ramachandran, his employee K Murugan, 38, saw fire in the sugarcane field around 4pm.

Sugar stocks fall after competition watchdog imposes penalty.

Shares of Bajaj Hindusthan Sugar, Dalmia Bharat Sugar and Industries and Balrampur Chini Mills plunged as much as 3.2 per cent-9.1 per cent. Competition Commission Of India (CCI) on Thursday imposed a penalty of Rs 380.5 million ($5.29 million) on sugar millsNSE -7.94 % and their associations for rigging bids.

India to consider sugar export subsidy proposal next week - food minister.

India will consider various proposals to support the sugar industry, including incentives for exports, at next week's cabinet meeting, Food Minister Ram Vilas Paswan said on Wednesday. The proposals were supposed to be discussed on Wednesday.

Sugar mills will come forward for exports, if govtsubsidises our losses: ISMA.

Sugar stocks have rallied in the last few sessions after the government approved more than 25 percent hike in the price of ethanol produced directly from sugarcane juice for blending in petrol last week.

Sugar stocks rally on report of Rs 4,500-crore package for sugar industry.

Shares of majority sugar stocks are soaring in trade on September 19, 2018 as investors cheered a likely package announcement by the government to boost exports. The likes of Avadh Sugar, Dharani Sugar, and Uttam Sugar, among others, are all rising in trade, while frontline sugar names are witnessing profit booking.

Cabinet likely to okay Rs 4,500 cr for sugar sector.

The Cabinet is likely to approve allocation of approximately Rs 4,500 crore for the sugar sector on Wednesday, which includes almost three-fold increase in production assistance paid to sugarcane farmers and transport subsidy to mills exporting about five million tonnes of sweetener.

Sugarcane growers protest in Karnataka, demand dues from 25 sugar factories.

Sugarcane growers, members of KabbuBelegararaSangha, on Tuesday took out a rally from the City Railway Station to Freedom Park demanding that 25 sugar factories in the state release their dues to the tune of Rs 230 crore.

New method more than doubles sugar production from plants.

Producing fuels and chemicals from biomass (wood, grasses, etc.) is one of the most promising solutions for building a renewable economy. The process involves breaking down, or "deconstructing," plants to produce single carbohydrates, mostly in the form of simple sugars like xylose and glucose.

Sugar prices zooms over Rs 300 per quintal.

Sugar prices rose up to Rs 320 per quintal at the wholesale market in the national capital Monday on aggressive offtake by stockists as well as bulk consumers after the government approved a hike over 25 per cent in ethanol prices. Furthermore, pause in supplies from mills in anticipation of a further rise.

From Plate to Plough: Drowning in sweetness.

The sugar sector is heading for a major crisis of plenty. India will begin the sugar season (October to September) with a sugar stock of about 10 million metric tonnes (MMT). The industry's production estimate for 2018-19 is 35.5 MMT, up from 32.3 MMT in 2017-18, against an annual consumption of about 26 MMT.

UPSMA hails cabinet decision to hike ethanol price.

Uttar Pradesh sugar industry has welcomed the National Democratic Alliance government's move to hike the price of ethanol for blending with petrol. The Cabinet Committee on Economic Affairs approved to fix the ex-mill price of ethanol derived out of 'B-heavy molasses' to Rs 52.43 per litre from the prevailing Rs 47.13 per litre.

India – Pakistan are together fighting for sugarcane farmers on a global level.

Governments of Brazil and Australia have been preparing to knock the doors of the World Trade Organization against India and Pakistan. Both countries claim that India and Pakistan together have increased sugar production in the world so much that the price of sugar has come to the floor globally.

Centre mulls increasing ex-mill price of sugar to help mill-owners clear arrears of cane-growers.

The government may increase the ex-mill price of at factory gate to Rs 33-34 a kg against the current rate of Rs 29 and make it mandatory for private to export at least seven million tonnes next year to tide over the crisis of high arrears of cane-growers.

Farmers prefer water-guzzlers sugarcane and paddy over climate resilient nutri-cereals, 7% dip in sown area for jowar, bajra, ragi, small millet.

The Indian farmer's love for water-guzzling crops like rice and remains intact given better prices and market access, with latest data showing a 7% dip in sown areas for "nutri-cereals" like jowar, bajra, ragi and small millet as compared to this time last year.

Clear dues by Oct 15 or face consequences: UP CM to sugar mills.

After the foundation stone laying ceremony for development of Delhi-Saharanpur highway in Baghpat, Uttar Pradesh chief minister Yogi Adityanath on Tuesday warned sugar mills in the state to either pay the pending cane dues to farmers by October 15 or face the consequences.

No sweet deal: Farmer disquiet, and a political churning, in western Uttar Pradesh's sugarcane belt.

If media reports are to be believed, the Yogi Adityanath government in Uttar Pradesh has finalised a multi-thousand crore package for the state's sugarcane farmers to clear their outstanding dues which are now hovering around the Rs 11,000 crore figure.

Ethanol plant to be set up in Hry to stop straw burning.

In a bid to manage the crop residue and prevent straw burning before the upcoming paddy season 2018, Haryana Government has signed a memorandum of understanding with Indian Oil Corporation to setup a 100 kilo litre per day Ethanol Plant (bio-refinery) at village Bohali, in Panipat at a cost of over Rs 900 crore.

Sugar prices fall on ample stock.

Sugar prices declined by Rs 40 per quintal at the wholesale market in the national capital today following ample stocks on persistent arrivals from mills amid slackened demand.

Philippines – 9 sugar mills finish 2017/18 campaign earlier as cane supply dries up.

Nine sugar mills have ended their 2017/18 campaign earlier than usual this crop year due to the 15% drop in cane production, according to local press reports.

Pakistan – 2017/18 sugar exports increase 5-fold.

Pakistan's sugar exports hit a new peak of 1.359 million tonnes fetching US$474 million during the first eleven months (July-May) of the financial year 2017-18 compared with 302,268 tonnes earning $158m over the same period last year.

China – No exemptions, from 1st August sugar exporters hit with hefty tariffs.

China will levy extra tariffs on out-of-quota sugar imports from all origins starting from August 1, the Commerce Ministry said on 16th July, just over a year after introducing a hefty duty on top exporters including Brazil and Thailand, reported Reuters.

US approves GM-modified cane developed by Centro de TecnologiaCanavieira.

The United States Federal Food and Drug Administration (FDA) concluded on 7th August that it is safe to consume raw and refined sugar produced from Brazil's first genetically-modified sugarcane variety, called CTC20BT.

Bunge sells its sugar trading operations to Wilmar.

The US-headquartered agribusiness Bunge said on 23rd August that it has completed the sale of its international sugar trading operation to Wilmar Sugar in Singapore. The financial terms of the deal were not disclosed, according to Reuters.

Qatar to build 110,000 tonnes capacity sugar refinery for strategic reasons.
Qatar is going to build a new sugar refinery to address lack of access to sugar supplies from refineries in the Gulf countries after the economic and political ties were cut off with Doha more than a year ago, reported Reuters.

Brazil – Raízen partners with Geo Energética to build a biogas plant.
The sugar-ethanol producer Raízen, co-owned by Cosan and Shell giants is partnering with Geo Energética to build a power plant from biogas produced from waste streams from cane sugar processing – namely filter cake and vinasse, according to local press reports.

Mexico – 2018/19 raw sugar exports to USA set at 750,877 tonnes
The Secretariat of Economy (SE) on August 15, 2018, announced in the DiarioOficial (Federal Register) a maximum sugar quota of 750,876.85 tonnes on a raw value basis for export to the United States during the 2018/19 sugar cycle.

EU – Sugar beet yields in 2018 down by 9%.
Sugar beet yields across the EU on average are estimated to have dropped by 9% in 2018 to 73.8 t/ha from 81.1 t in 2017. This is also 1% less than the last five years average of 74.6 t, according to the latest report from the European Commission's MARS report.

Crop losses from global warming likely to hit the temperate zone most from insect pests.
Researchers from several universities in the US claim that wheat, maize and rice yields (particularly in northern climates) are projected to fall as insects in temperate regions thrive in a warmer climate.

Barbados – Gov't to privatise sugarcane industry.
The Barbados government is planning to merge the state-owned Barbados Agricultural Management Company Limited (BAMC) with the Barbados Sugar Industry Limited (BSIL), as it seeks to fully privatise the sugar cane industry, according to local press reports.

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➢ ABSTRACTS:

Effects of compost and mill mud/ash on soil carbon and the nematode community in a field trial on sugarcane at Harwood, New South Wales, Australia by GR Stirling, AJ Young, RL Aitken, RN Beattie & A Munro published in International Sugar Journal July, 2018.

A field trial at Harwood, New South Wales compared an amendment of mill mud/ash with compost produced from mill mud/ash, bagasse and wood waste. The trial contained 13 treatments (compost at 13, 26, 55 and 66 dry t/ha; mud/ash at 15, 30, 58 and 90 dry t/ha; and urea at 0, 40, 82, 140 and 230 kg N/ha). Data collected from the two-year-old plant crop showed that both amendments improved sugarcane yield and that the response increased as the amendment rate increased. Analyses of soil organic carbon following plant crop harvest showed that both mud/ash and compost increased.

Narrow-sense heritability estimates of resistance of sugarcane to Sugarcane yellow leaf virus by Jean-Yves Hoarau, Daniele Roques, Jean-Claude Efile, Nadia Adjano-Lubin, Sarah Debibakas & Jean-Heinrich Daugrois published in International Sugar Journal July, 2018.

Sugarcane yellow leaf virus (SCYLV) can infect many modern sugarcane varieties and cause insidious yield losses in susceptible cultivars. Information about the heritability of resistance to SCYLV is useful in designing appropriate breeding strategies likely to generate genetic gains and develop resistant varieties. This study aimed at computing quantitative estimates of narrow-sense heritability (h2) of resistance to SCYLV using the parent-offspring regression method. A set of 37 genitors and a total of 41 derived bi-parental progenies were tested in field trials in natural conditions of infection prevailing in Guadeloupe.

What is the optimal selection intensity of seedlings (stage 1) in sugarcane breeding programs? By Phillip Jackson published in International Sugar Journal July, 2018.

Selection of seedlings in sugarcane breeding programs is a major task usually undertaken annually. Sugarcane breeding programs worldwide differ in how this is done, particularly in relation to intensity of selection (i.e. the proportion of seedlings selected to be advanced to the second stage of selection), with some programs selecting very intensively (e.g. 1% of seedlings taken to stage 2) while others select more liberally (e.g. >15% taken to stage 2). These differences partly reflect views on effectiveness of seedling selection: in theory high selection effectiveness should favour more intensive selection options than if selection is ineffective.

Why the emerging strong interest in vertical continuous pans? By R Broadfoot, D Rackemann & D. Moller published in International Sugar Journal July, 2018.

Several overseas cane sugar industries are implementing steam efficient practices in factory processing in order to achieve greater economic value from bagasse, e.g. from cogenerated export power, paper pulp, particle board and (maybe soon) second generation biofuels and chemicals. Many of these factories have installed falling film evaporators as part of the drive to steam efficiency. More recently, strong interest is developing in using vertical continuous vacuum pans (CVPs) with mechanical agitation to undertake evaporative crystallisation on low pressure vapour (e.g. using vapour 3 or vapour 4 bled from the evaporators).

Determining optimum tube dimensions for Robert evaporators by OP Thaval, R Broadfoot, GA Kent & DW Rackemann published in International Sugar Journal July, 2018.

Experimental investigations were undertaken for three tube lengths and three tube diameters in a pilot evaporator to determine the optimum tube dimensions for Robert evaporators. The pilot evaporator was tested at operating conditions typically encountered in sugar factory evaporators. Juice of three brix levels were selected to mimic conditions for the first, third and fifth effect positions in a quintuple evaporator set. For each brix, the heat transfer coefficient was calculated at four juice levels, two headspace pressures and two pressure differences between the calandria and the head space.

Characterization of sugarcane grassy shoot phytoplasma and its impact on growth, yield and juice quality of old growing sugarcane varieties in North East Regions of India by A. K. Gogoi, Madhupriya, M. K. Kalita, G.P.Rao & P.D. Nath published in International Sugar Journal August, 2018.

An extensive survey was conducted during 2015-2017 in six North Eastern States of India covering 52 districts to record the incidence of sugarcane grassy shoot (SCGS) caused by phytoplasma and molecular characterization of the associated phytoplasma strains. The disease incidence was in the range 2- 40%. PCR analysis using phytoplasma specific primers (16Sr RNA and secA genes), comparison of 16S rDNA sequences and phylogenetic analysis of SCGS strains confirmed the association of 'Candidatus Phytoplasmaoryzae' (16SrXI group) related strains in symptomatic sugarcane varieties in all the six states.

Sugar plants enhance efficiency and boost output with variable speed drives by Harri Vaarapublished in International Sugar Journal August, 2018.

The effective use of variable speed drives (VSDs) to improve energy efficiency in sugar factories is discussed as well as how VSDs help to increase productivity and create new revenue streams from selling excess energy to local power networks. Historically, steam power has been used for the cane crushing process, but there is a recent trend towards electrification, where steam is used

to drive electrical generators and the electricity produced powers machinery via an ABB VSD and motors.

Efficiency of arbuscularmycorrhiza fungal inoculation with rock phosphate on soil-available phosphorus, and drought stress, growth and yield of sugarcane under field conditions by Suchat Juntahum & Sophon Boonlue published in International Sugar Journal August, 2018.

A field study was conducted under rain-fed conditions to investigate the effect of arbuscularmycorrhizal fungi (AMF), Funneliformismosseae KKU-BRP-KK6-2 inoculation with rock phosphate (RP) application on soil-available phosphorus (P), proline content in leaves, major nutrient uptake, biomass, promotion of growth, and productivity of sugarcane. The experiment design was carried out in a randomized complete-block design (RCBD) with three treatments: control, AMF inoculation and applied RP (AMF+RP), and applied RP (RP). Data were recorded every 4 months until harvest (approximately 12 months). Colonization intensity in the sugarcane root was increased by inoculation of AMF.

Erythorbate, an alternative to sulfite in the prevention of corrosion in sugar mill boilers by D Rodman, D Otley&L Rodriguezpublished in International Sugar Journal August, 2018.

Sulphite based oxygen scavengers have previously been shown to not react as expected with dissolved oxygen in sugar mill feed water to effectively remove it. Alternative oxygen scavengers were studied with respect to their ability to react with dissolved oxygen in sugar mill feed water. An erythorbate based product was able to reduce the dissolved oxygen concentration in the feed water and the oxidation reduction potential (ORP) of the system compared to periods of dosing with sulphite. A tannin based product did not appear to have any measureable impact on either dissolved oxygen or ORP.

The race is on: review, advances and challenges for integrated and sustainable management of sugarcane brown rust and orange rust in Colombia by Juan C Ángel S, Jorge I Victoria K, Marcela Cadavid O & Carlos A Ángel C published in International Sugar Journal September, 2018.

Sugarcane is an important crop in Colombia, being planted in 230,000 ha in the Cauca River Valley and grown by 13 mills and 2,750 farmers. This paper illustrates the strategy for management of brown rust (BR) (Pucciniamelanocephala) and orange rust (OR) (P. kuehnii) diseases since their arrival in 1978 and 2010, respectively. BR initially caused up to 9% yield losses on imported susceptible varieties, so CENICAÑA-Colombia (CC) started a breeding program in 1981 that included BR resistance. CC85-92 and CC84-75 varieties were released in 1991, reaching by 2010 almost 90% of the area.

Profitability and environmental implications when growers transition to best management practices by M Poggio, MA Renouf, C Connolly & M Thompson published in International Sugar Journal September, 2018.

Best Management Practices (BMPs) have been developed on the basis that they are perceived to be beneficial for production and the environment. However research that holistically examines the economic and environmental implications of BMP adoption using 'real-farm' case studies is limited. The aim of this work was to evaluate the farm profitability and life cycle environmental implications of BMP adoption by six sugarcane growers in the Wet Tropics region of North Queensland. Economic, biophysical and farm management data before and after BMP adoption were supplied by participating growers and used in the Farm Economic Analysis Tool (FEAT).

Internet of Things provides smarter irrigation management in Australian sugarcane by E Wang, S Attard, Y Everingham, B Philippa &W Xiang published in International Sugar Journal September, 2018.

Irrigation management is a considerable time investment for many sugarcane farmers. Better irrigation practices can lead to improved yields through less water stress and reduced water usage to deliver economic benefits for farmers. In some cases reduced runoff and deep drainage from excess irrigation can also deliver benefits to the environment. The Internet of Things (IoT) is about allowing things to sense, to communicate, and thus create opportunities for more direct integration between the physical world and computer-based systems. IoT has been transforming all spheres of life into smart homes, smart cities, and smart healthcare.

Further reduction of steam demand at modern cane sugar mills by F. Brahim, A. Lehnberger, SSMallikarjun R Nasim published in International Sugar Journal September, 2018.

More and more cane sugar factories are closely monitoring their energy consumption figures and trying to reduce their steam demand to a minimum by investing in equipment and process optimisation. The new global tendency to install cogeneration plants is the main reason for the cane sugar factories to monitor not only the daily quantity of sugar produced, but also the amount of bagasse quantity that is saved each day. The bagasse saved serves as an energy source after crushing to produce electric power that is then fed into the local mains.

Energy efficiency improvements with vertical shell and tube juice heaters at Millaquin Mill by D Dignon, NJ Sichter&GG Barazzapublished in International Sugar Journal September, 2018.

New secondary juice heater station was installed at Millaquin Mill for the 2017 season to improve the process energy efficiency and

provide surplus bagasse for operation of the refinery in the non-crush. A set of four vertical shell and tube heaters were installed for consecutive heating of secondary juice with V3, V2 and V1 vapours in three of the heaters with the fourth heater on cleaning or standby. The operation of the secondary juice heaters was monitored during the 2017 season. The measured overall heat transfer coefficients (OHTCs), fouling rate factors and pressure drops were compared with values

Evaluation of sucrose loss in evaporators for different processing configurations by DW Rackemann and R Broadfoot published in Indian Sugar August, 2018.

The chemical compositions were determined for juice and condensate samples collected at various locations in the Robert evaporator sets at two Australian sugar factories. The purpose of the investigations was primarily to determine the magnitude of sucrose degradation and the consequences of those degradation reactions, such as reduced pH of condensate, Robert evaporators are used almost exclusively in Australian sugar factories.