SHARKARA

OCTOBER-DECEMBER – 2018 VOLUME – 49, NO. -04

NATIONAL SUGAR INSTITUTE

Department of Food & Public Distribution
Ministry of Consumer Affairs, Food & Public Distribution
Government of India
Kanpur-208 017, INDIA
Email : nsikanpur@nic.in
Visit us at: http://nsi.gov.in
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VOLUME-49, NO .04

OCTOBER-DECEMBER, 2018

It contains……..

FROM DIRECTOR'S DESK.....

India's sugar production increased by 7 per cent to 110.52 lakh tonnes in the first quarter of sugar season 2018-19 as mills in Maharashtra and Karnataka started operations early. As on December 31, 2018, 501 sugar mills started operations in the country and produced 110.52 lakh tonnes of sugar, as compared to 103.56 lakh tonnes produced by 505 sugar mills during the same period of preceding crushing season. Although the sugar production during the current sugar season is expected to be lower than last season, but will be higher considerably than the domestic consumption.

On the other hand, India's sugar exports have become tougher due to strengthening of rupee and falling global sugar prices making shipments unattractive despite a government push for overseas sales. Lower shipments could support global prices that fell more than 20 percent in 2018, but fewer exports could also increase stocks making it troublesome for the sugar industry. News regarding B Heavy molasses diversion have been received from few factories now which is a good sign and I hope industry will make now arduous efforts to harness the unexploited potential of by-products. As I am always emphasizing upon, the sugar industry should now seriously brainstorm on quality of sugar to be produced keeping in view the market requirements & consumer preferences.

Wishing you a very Happy New Year 2019.

(Narendra Mohan)
Director

➢ OUR PROVISIONS:

➢ 49TH CONVOCATION ORGANIZED:

The 49thConvocation of National Sugar Institute, Kanpur was held on 5thOctober 2018. Shri C.R. Chaudhary, Hon'ble Minister of State, Ministry of Consumer Affairs, Food & Public Distribution and Commerce & Industry, Government of India graced the occasion as Chief Guest.ShriDevendra Singh "Bhole", Hon'ble Member of Parliament also graced the function as Guest of Honour. Shri Suresh Kumar Vashishth, IAS, Joint Secretary (Sugar & Administration) Ministry of Consumer Affairs, Food & Public Distribution, Department of Food & Public Distribution New Delhi presided over the function.


During the Convocation Diploma's & Certificates were given to **413** students of 2016 & 2017 batch. **05 Gold Medal's**&**40 Scholoarships** were also given on this occasion

➢ INAUGURATION OF SPECIAL SUGAR DIVISION:

Shri C.R. Chaudhary, Hon'ble Minister of State, Ministry of Consumer Affairs, Food & Public Distribution and Commerce & Industry, Government of India inaugurated the newly constructed Special Sugar Division. This will facilitate the students of various courses to get training for the production of different kind of Flavored& other special sugars.



The division has been established with the financial support extended by Dr. G.S.C. Rao, CMD, Global Cane Sugar Services Pvt. Ltd., & an alumni of the institute.

➢ TRAINING PROGRAMME ORGANIZED:

Fifth phase of three days training programme on "Effluent Treatment Plant Operation & Laboratory Analysis" for 68 technical personnel conducted during the period.



➢ SEMINAR ORGANIZED:

1. National Seminar on **"Techno-economic Viability of Sugarcane Juice and B-Heavy Molasses as Alternate Feed Stock for Ethanol Production"** was organized jointly with The Sugar Technologists Association of India on 16th October 2018 at NSI, Kanpur. Papers relating to differential pricing policy for ethanol & relative economics of ethanol production from convocational route, B-Heavy molasses & cane juices were presented during the seminar.


2. From 26th to 28thOctober, 2018 at Indian Institute Sugarcane Research, Lucknow, Institute took part in "**KrishiKumbh"**. Display of solar seed treatment unit, electro-coagulation based effluent treatment unit, bio gas unit and many more institute activities was made during the event.


3. Institute jointly with Co-generation Association of India organized **"One day meet on Ethanol for Promotion of Distillery/Ethanol Projects"** on 31stOctober 2018 at Kanpur in which large number of delegates from Uttar Pradesh, Bihar, Uttarakhand& Haryana participated.


➢ EXTENSION LECTURES:

1. Shri B.H. Shrikanth (Chief Consultant) Sciencia Industrial Project Consultants, Pune delivered a lecture on **"Ethanol-An Eco-friendly Green Chemical Industry for Sustainable Auto Fuel and Energy Security"** on 11th October, 2018 at the institute for the benefit of students as well as faculty.



2. ShriAmit Kumar (Director & Sr. Consultant), Shabda Risk Assessment & Consultancy Services, New Delhi made a Presentation on **"Risk Prevention for best Out Comes in Indian Sugar Industry"** highlighting the profit center model for the sugar industry on 28th November, 2018 at the institute.



➢ OUR OTHER ACTIVITIES:

1. संस्थान मेंदिनांक 29.10.2018 से 03.11.2018 तक **"सतर्कता जागरूकता सप्ताह–2018"** का आयोजन किया गया एवं इस अवसर पर दिनांक 29.10.2018 को संस्थानकर्मियों को **सतर्कता जागरुकता** की शपथ दिलाई गई।इस सप्ताह के दौरान संस्थानकर्मियों एवं छात्रों के लिये निबंध एवं व्याख्यान प्रतियोगितायें आयोजित की गईं।



2.संस्थान में दिनांक 31-10-2018 को अधिकारियों, कर्मचारियों एवं छात्रों को सरदार बल्लभ भाई पटेल के जन्मतिथि के उपलक्ष्य में **एकता एवं अखण्डता** की शपथ दिलाई गई।



3. संस्थान में दिनांक 26–11–2018 को अधिकारियोंके छात्रों एवं कर्मचारियों ,द्वारा **"संविधान दिवस"** पर **"प्रस्तावना"** पढ़ी गयी।



4.सरकारी कामकाज में राजभाषा के रुप में हिन्दी के प्रति जागरुकता लाने तथा उसके उत्तरोत्तर विकास हेतु संस्थान में 18 दिसम्बर 2018 को **हिन्दी कार्यशाला** का आयोजन किया गया।इस कार्यालय में संस्थान के नवागतुंग अधिकारियों व कर्मचारियों को राजभाषा में कार्य करने हेतु सरकारी दिशा निर्देशों से अवगत कराते हुए अधिकतम कार्य राजभाषा में करने हेतु प्रेरितकिया गया। इस कार्यशाला में शर्कराउद्योग से संबंधित एक हिंदी शब्दकोष बनाने का भी निर्णय लिया गया।

5. Students of "Rama University" Kanpur visited institute on 15th November, 2018. They visited various Laboratories, Nano Brewery, Nano Ethanol Unit & Experimental Sugar Factory situated in the institute.



6. A Farewell party for the final year students of various courses was organized on 31st October, 2018 at the institute. Many cultural activities were organized by the students on this occasion. Director & faculty members wished the final year students a bright & successful carrier ahead.


➢ 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. Preparation to take up field trials is on-going by carrying out mass multiplication of different bio-fertilizers viz, PSB, Azatobacter& Rhizobium.



2. Utilization of bagasse as dietary fiber - Studies on characteristics of bagasse as a food supplement initiated. Comparative study of Physical parameters viz; Swelling Power, Solubility Index, Water Absorption Capacity of commercial available product (from abroad) and own samples treated with different concentration of Alkali like Control; 0.1N, 0.25N, 0.5N, 0.75N& 1N Results revealed that Swelling power, Solubility Index, Water absorption Capacity & Oil absorption capacity of even our Control & 0.1N treatment was far better than commercial product. Emulsification capacity, Chemical analysis namely: lignin, hemi-cellulose and cellulose and Microbial load will also be checked. To match the texture large quantity of bagasse (1Kg each) will be grinded and treated, washed and dried then tested.



3. Filter Cake to CNG-With an aim to utilize the filter cake for production of Bio-CNG, different combinations filter cake, farm yard manure and spent wash were initially tried on laboratory scale & then a small pilot plant was developed. Document of Patent on "Production of Bio-CNG from Filter cake" ready and will be submitted shortly. Preliminary studies indicate production of one kg Bio-CNG from about 25 kg of filter cake & thus it can be a useful source for adding value to the revenue pot of the sugar factory.


4. Studies on the feasibility of utilization of sugarcane bagasse as a potential feedstock to access cosmetic ingredients - Study aims at valorization of pentose sugar of bagasse. The synthesized and isolated compound under this research problem is being analyzed for characterization and some results are awaited. The product derived is being used as cosmetic ingredient in anti-aging creams as observed in many reputed brands.

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 results of the characterization of bagasse & trash derived products obtained during preliminary experiments performed in a proto type SS pot are awaited.

Additionally, feasibility and merits of developed method in a bio-refinery concept is under investigation along with the preliminary economic analysis of the valorization of 100 kg bagasse into surfactant and other products in the India context.In order to access the bagasse derived surfactant up to few grams, the batch reactions have been put and isolation of the desired material is under progress.



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 synthesis of xylitol from sugarcane trash has been completed. Few experiments have been performed to access xylitol from xylan-isolated from bagasse.The initially isolated compound is being analyzed and some results are still awaited.

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 feed stocks. The literature survey on the topic has been completed.The isolation and characterization of cellulose (to be used as raw material) from bagasse is under progress.

8. Mechanical Clarification of Juice -This research scheme has been taken up with a view to eliminate the use of sulphur in sugar cane juice clarification for production of white sugar. Experiments with cane juice have been conducted with application of different flocculant dose& centrifugation times. Encouraging results have been observed while conducting trials on laboratory scale. Further experiments with heat treatments are in progress.

9. Use of Brine reject in Final Molasses -Brine recovery and disposal of brine reject is an area of concern from environment angle. Fresh sample of brine reject and molasses have been procured and further experiments are being conducted to assess the effect of brine reject on molasses quality upon storage. In the study which is being carried out on laboratory scale to the final molasses samples, brine reject is added & quality of final molasses is being analyzed after regular internal of times to assess the purity, total sugar contact & fermentation efficiency as well.

10. Development of Super Short Retention Time Clarifier- Modified drawing has been developedand procurement of the material is under progress for the fabrication of clarifier so as to conduct pilot scale trials during the crushing season of Experimental Sugar Factory. The clarifier is being developed so as to work it on 10 minutes retention time for the juices from plantation white sugar factory.

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

1."Economy of Ethanol Production" by N. Mohan and D. Swain presented in National Seminar on "Techno-economic Viability of Sugarcane Juice and B-Heavy Molasses as Alternate Feed Stock for Ethanol Production" organized on 16th October 2018 at NSI, Kanpur.

2. "Final Molasses Vs B-Heavy and juice" presented by Shri D. Swain in "One day meet on Ethanol for Promotion of Distillery/Ethanol Projects" jointly organized with Co-generation Association of India on 31st October 2018 at Kanpur.

3. "Quality Standards & Packaging Requirements for Sugar in Indian and Global Scenario" by Anushka Agarwal & Narendra Mohan sent for publication in Sugar Technology-An International Journal of Sugar Crops and related industries.

4. "Effect of Potassium Application on Nutrient Uptake, Yield and Quality of Sugarcane & Sustainable Soil Health" by Narendra Mohan, Ashok Kumar &Lokesh Babar sent for publication in International Journal of Green Farming.

5. "Integrated Nutrient Management for Maximum Economic Yield of Sugar Beet and Sustainable Soil Health" by Ashok Kumar & Lokesh Babar sent for publication in Agrica – An International Journal of Plant Science Researches.

6. "A Reduced Switch Count Hybrid Fifteen-Level Inverter for an Open-End Winding Induction Motor (OEWIM) Drive" by Anoop Kumar Kanaujia & Sanjiv Kumar presented during 8th IEEE International Conference on power Electronics (IICPE-2018) held on December 13-15th 2018 at Jaipur.

7. "A Hybrid Twenty Five-Level Inverter for an Open-End Winding Induction Motor (OEWIM) Drive" by Anoop Kumar Kanaujia&Sanjiv Kumar presented during 2ndIEEE International Conference on power Electronics (IICPE-2018) held on 22-24th October, 2018 at Delhi.

8. "Biomass Energy for Economic & Environmental Sustainability in India" by Narendra Mohan &Anoop Kumar Kanaujia sent for publication in Sugar Technology-An International Journal of Sugar Crops and related industries.

9. "Water and Effluent Management in Indian Sugar Factories – A Novel Approach" by Narendra Mohan, Mahendra Kumar Yadav & AmreshPratap Singh sent for publication in ISSCT Congress 2019.

10. "An Efficient Static Rotor-Resistance Control for the Motors of Preparatory Devices of a Sugar Factory" by Vinay Kumar presented in 33rd Indian Engineering Congress held on 22nd December, 2018 at Udaipur.

11. "Sugar Production to Meet Health Concerns and Consumer Preferences" by Anushka Agarwal & Narendra Mohan sent for publication in American Journal of Food, Nutrition and Health.

12. "Bio-energy & Efficiency- Key Factors for the Sustainability of Indian Sugar Industry" by Narendra Mohan & D. Swain sent for publication in ISSCT Congress 2019.

13. "Ethanol from B-Heavy Molasses for Sustainability of Indian Sugar Industry" by Narendra Mohan, D. Swain & Seema Paroha sent for publication in ISSCT Congress 2019.

14. "Bio-refinery approach for valorization of sugarcane biomass based xylans to alkyl glycosides" by Narendra Mohan, Dr. V.P. Srivastava & Anushka Agarwal sent for publication in ISSCT Congress 2019.

➢ 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

During the period October-December 2018, 1195 Sugar Standard Grades were sold to 241 sugar factories & other users.

➢ 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 October-December, 2018 consultancy services were provided to the following:

1.	M/s MRN Cane Power (India) Ltd., Kallapur, Distt- Bagalkot, Karnataka**.**
2.	M/s U.P. Co-operative Factories Federation Ltd., Lucknow, U.P.
3.	M/s Mott Mac Donald Pvt. Ltd., Mumbai, Maharashtra.
4.	M/s Kichha Sugar Co-operation Factory Ltd., Distt – U.S. Nagar, Uttarakhand.
5.	M/s ShravastiKisanSahakari Chini Mills Ltd., Nanpara, Distt – Bahraich, U.P.
6.	M/s KisanSahakari Chini Mills Ltd., Mahumadabad, Distt – Sitapur, U.P.
7.	M/s KisanSahakari Chini Mills Ltd., Ghoshi, Distt – Mau, U.P.
8.	M/s KisanSahakari Chini Mills Ltd., Sathiaon, Distt – Azamgarh, U.P.
9.	M/s SarjooSahakari Chini Mills Ltd., Belrayan, Distt - Lakhimpur-Kheri, U.P.
10.	M/s KisanSahakari Chini Mills Ltd., Sampurnanagar, Distt – Lakhimpur-Kheri, U.P.
11.	M/s DSCL Sugar, Hariawan, Distt – Hardoi, U.P.
12.	M/s Unnao Distilleries & Breweries Ltd., Shekhpur, Distt – Unnao, U.P.
13.	M/s National Forum of Sugar Consultants, New Delhi.
14.	M/s Doiwala Sugar Company Ltd., Doiwala, Uttarakhand.
15.	M/s KisanShakari Chini Mills Ltd., Rudrabilaspur, U.P.
16.	M/s KisanShakari Chini Mills Ltd., Distt – Baduan, U.P.

17.	M/s Balrampur Chini Mills Ltd., Unit – Akabarpur, Distt – Ambedkar Nagar, U.P.
18.	M/s Balrampur Chini Mills Ltd., Unit – Mankanpur, Distt – Gonda, U.P.
19.	M/s Tulsipur Sugar Company, Tulsipur, Distt – Balrampur, U.P.
20.	M/s Maizapur Chini Mills Ltd., Distt – Gonda, U.P.
21.	M/s Simbhauli Sugars Ltd., Simbhauli, Distt – Hapur, U.P.
22.	M/s Sadguru Sri SriSakharKarkhana Ltd., Distt – Pune, Maharashtra.
23.	M/s Jind Co-operative Sugar Mills Ltd., Jind, Haryana.
24.	M/s Harinagar Sugar Mills Ltd., West Champaran, Bihar.
25.	M/s U.P. State Sugar Mills Co-operation Ltd., Lucknow, U.P.
26.	M/s Mysore Sugar Company Ltd., Mandya, Karnataka.
27.	M/s Dhampur Sugar Mills Ltd., Meerganj, Distt – Bareilly, U.P.
28.	M/s Rai Bahadur Narain Singh Mills Ltd., Laksar, Distt – Haridwar, Uttarakhand.

➢ 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 KisanSahakari Chini Mills Ltd., Sampurana Nagar, Distt – Lakhimpur-Kehri, U.P.
2.	M/s Dalmia Chini Mills Ltd., Unit – Nigohi, Distt – Saharanpur, U.P.
3.	M/s L.H. Sugar Factories Ltd., Distt – Pilibhit, U.P.
4.	M/s Novel Sugar Ltd., Bankhera, Distt – Pilibhit, U.P.
5.	M/s Dhampur Sugar Mills Ltd., Dhampur, Distt – Bijnor, U.P.
6.	M/s KisanSahakari Chini Mills Ltd., Powayan, Distt – Shahjahanpur, U.P.
7.	M/s The SeksariaBiswan Sugar Factory Ltd., Distt – Sitapur, U.P.
8.	M/s DSM Sugar Meerganj, Distt – Bareilly, U.P.
9.	M/s Dhampur Sugar Mills Ltd., Unit – Dhampur, Distt – Bijnor, U.P.

10.	M/s Simbhauli Sugar Ltd., Distt – Ghaziabad, U.P.
11.	M/s Rai Bahadur Narain Singh Sugar Mills Ltd., Laksar, Distt – Haridwar, U.P.
12.	M/s Daurala Sugar Works, Daurala, Distt – Meerut, U.P.
13.	M/s Harinagar Sugar Mills Ltd., Distt – West Champaran, Bihar.
14	M/s Triveni Engineering & Industries, Unit – Khatauli
15.	M/s Novel Sugar Mills Ltd., Barkhera, Distt – Piliphit, U.P.
16.	M/s Batala Co-op Sugar Mills, Distt – Gurdaspur, Punjab.

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

➢ HAPPENING IN THE SUGAR INDUSTRY:

We need a mechanism to maintain sugar prices without quota system: Rohit Pawar.

The 2018-19 sugar season for Maharashtra is starting under duress, with many millers expressing their inability to pay the growers. The state is supposed to crush 1,049 lakh tonnes of cane and produce around 106 lakh tonnes of sweetener.

Tamil Nadu: Make exports compulsory for sugar mills, plead industry association.

The sugar mills in Tamil Nadu, whose production has been exceeding domestic demands since the last two seasons, want the government to make exports compulsory for each sugar mill. As per the estimates of the Indian Sugar Mills' Association sugar production during the 2018-2019 (October to September) season to be 35 million tons.

Sugar mills that fail to clear cane dues will not be issued crushing licence.

Right at the beginning of the crushing season, Sugar Commissioner Sambhaji Kadu Patil has warned to not issue crushing license to mills that have failed to clear their cane dues. This warning, effectively might affect the functioning of 40 mills in the state that have unpaid dues worth Rs 336.15 crore.

25 govt-run UP sugar mills settle Rs 9 bn of outstanding cane farmers' dues.

Within a week of Chief Minister Yogi Adityanath setting November 30 as the deadline for private sugar mills in Uttar Pradesh to settle outstanding dues with farmers, 25 government-run mills have settled more than Rs 9 billion of arrears. On September 25, the CM had asked mills to pay farmers' arrears by November-end.

Deficient rains to hurt India's 2019-20 sugar production.

Drought-like conditions delayed sugarcane planting in Maharashtra and other parts of peninsular India that will substantially reduce 2019-20 sugarNSE -1.44 % production of India and help ease pressure on global sugar prices as India begins export of surplus in a couple of years published in Economics Times in October, 2018.

Sugar millers will be under pressure because of surplus production, says ISMA.

AbinashVerma, Director General of ISMA, spoke to CNBC-TV18 about the current trend in sugar prices and likely demand ahead of the festival season. Verma said, "These are no expected lines and as you mentioned Brazil is reducing their production by almost 7-8 million tonne.

Union Minister Gadkari calls for use of alternative fuels like ethanol, methanol, bio-diesel.

Union Minister for Road Transport, Shipping and Water Resources, NitinGadkari has called for the use of alternative fuels like ethanol, methanol and bio-diesel. Addressing the "India Chem 2018" exhibition cum conference in Mumbai, Mr. Gadkari said ethanol is the future and government has decided to increase its production news published in Economics Times in October, 2018.

Yogi govt clears six biofuel investment proposals worth Rs 17 billion.

In a boost to its green energy roadmap, the Yogi Adityanath government has cleared six biofuel investment proposals worth almost Rs 17 billion. These private projects are proposed to be set up in 5 districts, including Sitapur, Hapur, Meerut, Bareilly and Muzaffarnagar.

Country's first ethanol plant to come up in Odisha'sBargarh district.

Odisha is going to have a Second Generation (2G) Ethanol Bio-Refinery, first in the country to produce ethanol from rice straw, in Bargarh district. The facility, which is expecting its mechanical commissioning in the next two years, is one among 12 refineries planned in 11 States in the country.

Sugar package good, but unlikely to ease problem.

To tackle the sugar cane arrears that stand at Rs 13,000 crore for the 2017-18 sugar season, the central government on September 26 approved an Rs 5,500 crore comprehensive policy package. It is also aimed at improving liquidity with sugar mills and helping them clear cane arrears as much as possible published in Economics Times in October, 2018.

Dwarikesh Sugar plans to increase ethanol capacity to 1 lakh litre per day.

After reporting a 50 percent decline in net profit, Dwarikesh Sugar on Friday said the company plans to increase ethanol capacity to 1 lakh litre per day. In an interview to CNBC-TV18, Vijay Banka, managing director, said Q2 is a challenging quarter for sugar industry as it's an offseason quarter.

South Maharashtra sugar mills will not operate as farmer organisations demand more money.

Some sugar mills in south Maharashtra have decided not to begin sugarcane crushing as farmers have demanded more money for this season's crop, beyond what is considered as fair and remunerative prices (FRP).

Sugarcane growers urge government to look into their problems.

It is a long-pending issue which needs to be addressed at the earliest. The fight between sugarcane growers and sugar factories has been on for a very long time. Despite knowing the intensity of the problem, the state government seems lethargic when it comes to solving it.

Pollution board orders sealing of sugar mill.

The Haryana State Pollution Control Board (HSPCB) has ordered sealing of and snapping of power supply to the Panipat Cooperative Sugar Mill over air pollution. Following the HSPCB direction, the XEN City had directed the SDO, Model Town, to disconnect power supply to the sugar mill.

Farmer forced to sell sugarcane to 'kolhu' units to meet Diwali expenses.

Cane farmers may have lifted the siege at the collectorate here after being assured that mills would begin crushing from November 11, they have little to cheer for this Diwali as their dues to the tune of Rs 567 crore are yet to be cleared.

Why farmers' demands to the mills will add to a never-ending cycle of sugarcane arrears and problems.

According to the Economic Times, some sugar mills in south Maharashtra have decided not to begin sugarcane crushing as farmers have demanded more money for this season's crop, beyond the fixed remunerative prices (FRPs).

UP government in a fix over rise in cane production cost.

With the cost of cane production rising by Rs 10 per quintal, the BJP government is now under pressure to increase the State Advisory Price (SAP), the compensation given to cane growers, ahead of the crucial LokSabha elections.

Cane price can't be lower than fair remunerative price: DC.

Deputy commissioner S B Bommanhalli directed sugar mill managements in the district to announce rates according to the fair remunerative price (FRP) of the central government. He issued the directions after holding consecutive meetings with sugarcane growers and managements of sugar mills.

Bottles with reflectors mandatory on vehicles transporting sugar cane.

Highway Safety Patrol (HSP) officials have come up with the idea of attaching bottles with reflector stickers at the end of sugar canes to avert accidents involving vehicles carrying the

crop. This comes in the wake of the death of four persons, including three of a family, in separate accidents involving vehicles.

Sugarcane farmer strength waning over unpaid dues, poor government support.

With very little encouragement from the government and plenty of hurdles along the way, sugarcane farmers in the state are slowly giving up the trade and opting to cultivate other crops. "Farmers cultivating sugarcane do not get payments on time for cane supplied to the Sanjivani Sahakari Sakhar Karkhana—neither from the factory.

UP govt may add SAP to its Sugarcane.

In the country's biggest sugar-producing region — Uttar Pradesh, the state government is likely to do a marginal increase for the state advised price (SAP) on sugarcane, government sources said. Last year, the state government had increased prices by 3.3% to Rs 315 a quintal.

Pune: After bumper crop, sugar mills eye Chinese markets.

Indian sugar mills are eyeing the Chinese market this year as a potential export destination for their raw sugar. Prakash Naiknavare, managing director of the National Federation of Cooperative Sugar Factories, said plans were afoot to ensure 20 lakh tonne (lt) of raw sugar from India is exported to China.

Attorney General in favour of imposing a cess on sugar.

The Attorney General (AG) has come out in favour of imposing a cess on sugar, over and above the Goods and Services Taxes (GST). The move, if implemented, will benefit sugarcane farmers but hurt consumers as retail prices are likely to go up.

India asks China to release raw sugar export quota before Jan.

India has asked China to consider releasing its raw sugar export quota for the New Year earlier than January. This is because the domestic sugar mills would, by then, start making white sugar and switching over to raw sugar will be difficult, a government official said.

UP govt to clear pending dues of sugarcane farmers.

After chief minister Yogi Adityanath, Uttar Pradesh sugarcane department have taken special initiative to clear the pending dues of the sugarcane growers in the state. State sugarcane development minister Suresh Rana, is also monitoring that the disbursement of arrears of farmers should be given accord and that no callousness should be shown.

Private millers: Can't start crushing unless govt pays FRP and SAP difference amount.

Almost a week after the cooperative sugar mills started functioning, Punjab Private Sugar Mills Association has said its members couldn't start crushing unless the state government paid the

difference amount between fair and remunerative price (FRP) and state assured price (SAP), which is Rs 35 per quintal this year.

Sugar stays flat in routine trade.

Sugar prices at the Vashi wholesale market ruled flat on slack demand amid selling pressure. Prices for M-grade declined by ₹10/quintal and that of S-grade ruled steady. Naka and mill tender rates were unchanged. Arrivals were at 58-60 truck loads and local dispatches too were at the same level.

64% of Maharashtra cane mills yet to pay farmers.

Two months after the sugarcane crushing season commenced in Maharashtra, 64 per cent of the sugar millsNSE 0.22 % from the state haven't paid a penny to the farmers, while the total sugarcane price arrears stand at Rs 3,557 crore, which is 71 per cent of the total dues.

No new sugar factories amid over-production concern: Gadkari.

Union minister NitinGadkari on Sunday said that the government may stop allowing new sugar factories to come up to avoid the issue of over production of sugar. Gadkari was on a tour to the Satara and Sangli districts to lay the foundation stones of various infrastructural and water supply projects.

AP: Sugar factory continues to face financial constraints.

The fate of Kadapa Cooperative Sugar Factory (KCSF) at Chennur, near here is hanging in balance due to paucity of funds and differences between farmers and factory management. A number of families belonging to employees and farmers have been facing hardships due to the uncertainty.

India – Government approves export subsidy for 5 million tonnes sugar in 2018/19 season.

The Indian government on 26th September approved an INR45 billion (US$617 mln) 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, according to local press reports.

Pakistan – Govt approves subsidy-free export of 1mlntonnes sugar in 2018/19.

Pakistan's Economic Coordination Committee (ECC) on 3rd October approved 1 million tonnes of sugar exports for the 2018-19 (November-December) season, without any subsidies for freight or other financial support to the mills by either the Federal or Provincial Governments.

Philippines – Further sugar imports of 150,000 tonnes adds to 200,000 t in June.

The Philippines Sugar Regulatory Administration (SRA) recently ordered imports of 150,000 tonnes of sugar. This is in addition to importing 200,000 tonnes of the sweetener in June.

Zambia Sugar launches small sugar packs to extend affordability.

Zambia Sugar, part of Illovo Sugar, has introduced smaller sugar packs that will now be available in 195 and 330 grams, in a bid to tap the wider market, particularly those in lower income bracket who cannot afford to purchase bigger packs.

Togo – Cane cultivars trials progressing well – hopes for a new factory in 2020 raised.

Supported by the government, the Togolese Institute for Agronomic Research (ITRA) has been undertaking trials with cane cultivars over the past few years to identify suitable ones for the locality prior to embarking on building a new sugar factory.

Philippines – President Duterte abolishes the Philippine Sugar Corporation.

President Rodrigo Duterte ordered on October 25, the abolition of the Philippine Sugar Corporation (Philsucor), due to its overlapping functions with other entities.

Bangladesh removes 40% duty on sugar imports from India.

Bangladesh's commerce ministry agreed to withdraw the 40% duty on sugar imports from India on 1st November. The commerce Minister Tofail Ahmed made the announcement at a press briefing after talks with the Indian Food and Public Distribution Secretary Ravikant at his secretariat office in Dhaka.

Indonesia – Sugar takes top billing in the presidential race.

Indonesian President JokoWidodo, who's seeking another five-year term in 2019, has opened up the floodgates to sugar imports to stabilize domestic prices. It worked, but now he's facing the heat from local farmers, a key voting bloc, reports Bloomberg.

Australia lodges complaint against India at the WTO over its sugar export subsidies.

Australia has referred India to the World Trade Organization (WTO) over subsidies to the sugar industry which has helped it expand sugar production and contribute to the current global surplus which has seen price fall below UScents10/lb, and has adversely affected Australia's sugar industry.

Brazil and China agree to discuss prohibitive import tariffs on sugar in December.

China and Brazil have agreed to meet up in the third week of December to discuss punitive tariffs which has seen Brazil's exports to China dwindle from 71% of share to 8% over the past year.

Papua New Guinea – New build sugar mill project receives an investment of US$1 billion.
An agreement by Papua New Guinea (PNG), China and Thailand was signed in Port Moresby on 22nd November to build a new sugar mill and a cogen unit supported by cane plantation along with logistics infrastructure worth PGK3.4 billion (US$1 billion) in the Abau district of Central.

Brazil to formally complain against India's sugar subsidies at the WTO.
Brazil's trade chamber 'Camex' has approved an authorization for the country to open consultations with the World Trade Organization (WTO) Dispute Settlement Body, to challenge subsidies it says India gives to cane growers and sugar exporters.

South Korea – Imports of raw sugar likely to increase from India.
A delegation from the Indian sugar industry recently held discussions with top representatives of all three sugar refineries of South Korea in Seoul with a view to increasing exports of raw sugar.

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➢ RESEARCH ARTICLE:

"PRODUCTION OF REFINED QUALITY SUGAR DIRECTLY FROM CANE JUICE, ELIMINATING MUCH PRACTICED RAW /REFINED ROUTE"

by

Sura K. Bhojaraj & V.M. Kulkarni

➢ INTRODUCTION :

We are aware that sugar is not "manufactured" in sugar factory and is produced by the sugarcane (or sugar beet) in the farms. We, in sugar industry separate sucrose from the juice extracted from sugarcane. Thus, sugar industry is necessarily is separating or purification and separation industry where we sugar (sucrose) is bagged as pure form. While doing so we use different technologies to concentrate and purify sucrose for separating it as pure crystals in the bag. It is obvious that not all sucrose will be separated as crystals and some sucrose along with other impurities will be separated as molasses.

In India, we try to produce reasonably white sugar by double Sulphitation process where we treat juice with sulfur dioxide for clarification 1st and later treat syrup for bleaching for white sugar production. However, some sulfur remains in the sugar and sugar do have certain impurities and such "impure" sugar is not accepted as fit for human consumption in most of the countries.

Use of new technology or "out of box" processing can create ground to access market with premium by improving sugar quality

The quality improvement can be in raw sugar and also in producing better quality PWS with reduced sulfur

We are suggesting a Revolutionary process to produce direct refined quality sugar ,with suitable modification in operation conditions & redesigning Clarifier &Filteration equipment etc.

Sugarcane in and sugar out in minimum time, using lowest possible temperature without changing pH harshly!

Using appropriate Biocides at various stages to eliminate the microbial growth &use effective chemicals in various stages to increase the efficiency of clarification.

Avoiding impurity addition and formation

Not using sulfur

Filtration, using gravity against conventional Rotary vacuum filters, which increases efficiency & avoid usage of Bagacillo.

➢ Text of the paper :

Recent publication of NFCSF indicate Indias' opening sugar stock will be almost 105 lakh tons on 1st October 2018,as against 39lt at the start of 2017-18 season. With the revised production of 2018-19 expected to be at 320 lt& the domestic consumption to be 260lt,stocks at the end of season could touch 165 lt.

We have to get rid of this surplus sugar. One way out is to export sugar. Mills should be advised to produce only unrefined Raw Sugar during October – December. This entire sugar can be exported to Sugar refineries to Middle east, China, Bangladesh & Malaysia.

➢ Pricing :

Raw brown sugar from fresh cane is Dextran free& high polarization content of 99-99.5, with ease of converting to Refined sugar. It can fetch polarization premium of 4%,which translates Rs 19,000 /ton at dollar conversion rate of Rs 72/dollar. The ex-factory price ,after deducting Rs 2500 of bagging ,transport & port handling charges will be Rs 16,500/ton .Export at this rate is not feasible,w/o govt. incentive. The central govt in May provided a production subsidy of Rs 55/ton on cane, with a condition of exporting the sugar. While total target was set at 20lt of sugar in 2017-18 season ,actual shipment may not cross 5lt.The dead line is extended till December 2018.

The govt. should increase the cane incentive to toRs 75-100 /ton for export beyond 20 lt..It must also offer transport subsidy of Rs 2500 /ton for mills near ports &Rs 3000 /ton for those in hinterland.

Now coming to Industrial scenario : It is imperative to reduce the cost of sugar (sulphur free Sugar) by use of more effective chemicals :

For Cane sanitation ,which could kill 90 % of microbes.

Mill sanitation after 2nd mill to last mill : 90 % of microbes killed in cane juice.

By adding impurtity removing agent continuously in the clear juice receiving tank.

Adding viscocity reducer is used to improve crystallization working efficiency ,to be added in Syrup.

Now refined sugar directly from cane juice , eliminating much practiced Raw /refined route:

Time, temperature and pH are three main important factors as far as sugar recovery and quality are concerned as mentioned earlier. Conventional clarification process is on negative side for all these 3 factors! Very high temperature is not essential for clarification and efficiency of clarification can be well over 90% even at room temperature. Similarly there are various flocculating agents – cationic, anionic and non-ionic along with accelerators of flocculation like alum, ferric alum, aluminium chlorides etc. that can efficiently clarify any liquid within few minutes. It is matter of choosing right combination to suite particular liquid with suitable environment. Since organic matter in cane juice is significant, it would be easy to form flocks at temperature above 70^0C and addition of suitable combination of agents, these flocks can be settled in clarifier within few minutes.

We have selected such combination of 3 agents that can effectively clarify the sugarcane juice within 20 minutes at 75^0C. Adjustment of pH is not necessary; however, to reduce the dose of flocculent and to avoid inversion sugar losses; some amount of lime may be added to adjust pH near neutral. We can add some amount of activated carbon to absorb colouring matter during clarification.

The overflow of the clarifier – clear juice is passed thru polishing filter to avoid any chances of carryover of flock or carbon particles. The muddy is then filtered thru vacuum belt gravity filtration system. This is totally gravity based filtration system with washing mud to recover sugar using vacuum finally. Such belt filters do not require addition of bagacillo and are very efficient. The quality of this filtrate juice can be too good to be recycled back, thus it can be added to clear juice or may be send for fermentation with proper antimicrobial treatment. Choice depends on the economics of the process.

Thus the proposed new process fulfils the main norms of sugar technology, viz., time, temperature and pH as the process of juice clarification is carried at lower temperature (25^0 less), in short time of just 20 minutes in place of 3 to 3.5 hours and at natural pH as addition of

lime may be eliminated. Thus there is no addition of impurities and minimal formation of impurities that will enhance sugar recovery. In this process juice sulphitation is eliminated totally.

Normally Color transfer index for raw sugar is 100 : 1 i.e. 10000 IU color clear juice will produce about 100 IU sugar, whereas this color transfer index is reduced by great extent in secondary operation in sugar refinery where we require melt of 250 IU to produce sugar of 25 IU i.e. index of just 10 : 1!

This may be possible as the color having strong affinity towards sucrose crystals remains in the sugar and further color increases due to heat or caramelization which may have stronger affinity towards sucrose. We have observed that when we use Chemical -Sucrolor, this color transfer index becomes 130 / 160 : 1 and thus gives us chance to produce sugar of less than 25 IU color when clear juice color is about 3000 IU

New Clarification – Using Chemicals

- Juice treated for microbial control is heated to 75^0 C, neutralized with lime.
- For proper flocculation, polyelectrolyte, strong cationic and strong anionic flocculants are added in proper sequence with time.
- Juice is hold for **20 minutes in clarifier.**
- Overflow clear juice is filtered thru specially designed polishing filters and
- Mud is filtered thru special gravity filters ,which eliminates bagacillo otherwise used as filter aid in conventional oliver rotary vac.filter
- The filtrate of this operation is of very good quality & sent to clear juice receiver.
- Clear juice will have color less than 3500 IU and turbidity below 10 units, suitable to produce refined **sugar EC II grade below 45 IU**
- Less temperature, less lime and very short time will result in saving of sugar loss besides reducing loss in molasses and no scaling!
- **Further operations** : The clear juice after addition of filtrates will be of 20 Brix & sent to Clear juice preheaters for heating up to boiling point in subsequent evaporation.

- Quintuple system of Falling film type evaporators ,with massecuite boiling by 3rd vapours ,for better steam economy.

- Thus expected recovery rise by 0.7 -0.8% on cane! Plus best quality molasses.

- Because of reduction juice heating to 75 deg C ,instead of 100 + , therewill be saving in steam consumption also.

➢ ECONOMICS:

- The chemical cost of normal double sulfitation process is about Rs 20 – 35 per MT cane.
- Normal process produce 110 kg sugar
- For new process it will be Rs 55 per MT cane.
- New process will produce 118-120 kg refined sugar
- Thus by "investing" about **5 Cr in equipment (for 2500 TCD factory**) including addition of stage wise chemicals ,New design of clarifier with accessories & Gravity based filteration system ,using less vacuum in second phase. , and spending about Rs 25 more per MT cane on chemicals ,the benefit is more than Rs 200 per MT cane considering same sugar price
- Price difference in bulk is normally Rs 5 per kg thus there will be benefit of Rs 750 -820 per MT
- Thus, for factory crushing 5 lakh MT cane the net benefit will be Rs 7 .8-8.75 Cr same price and Rs 36-40 Cr for refined sugar price!
- **Payback on capital investment is within ½ season!**

➢ CONCLUDING REMARKS :

Thus by following above steps ,we could be able to eliminate conventional Raw Sugar manufacture followed by Refining process .And straight away produce better quality sugar ,by reducing the production cost & compatible price in present day situation. This is out of box thinking ,when compared to conventional process.

Attachements :

1) **Gravity Vacuum Belt filteration system**
2) **Process flow diagram**
3) **Tabulation showing the details of inversion losses**

References :

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(2013)115(1377),628-632.

2) Bhojaraj S.K.: Inversion studies in Evaporator station of various configurations & role of Falling film evaporators in reducing the losses.43rd Annual convention of SISSTA ,held in Vishakapatnam 2014 & 4th Symposium of Bharatiya Sugar ,held in Kolhapur 2016

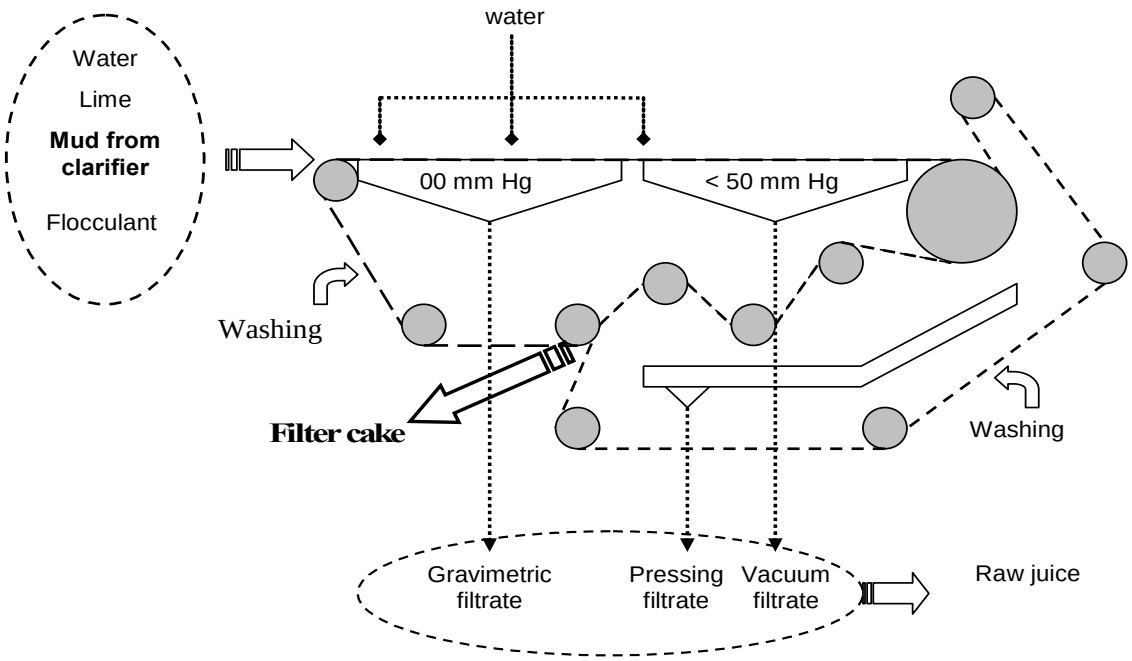
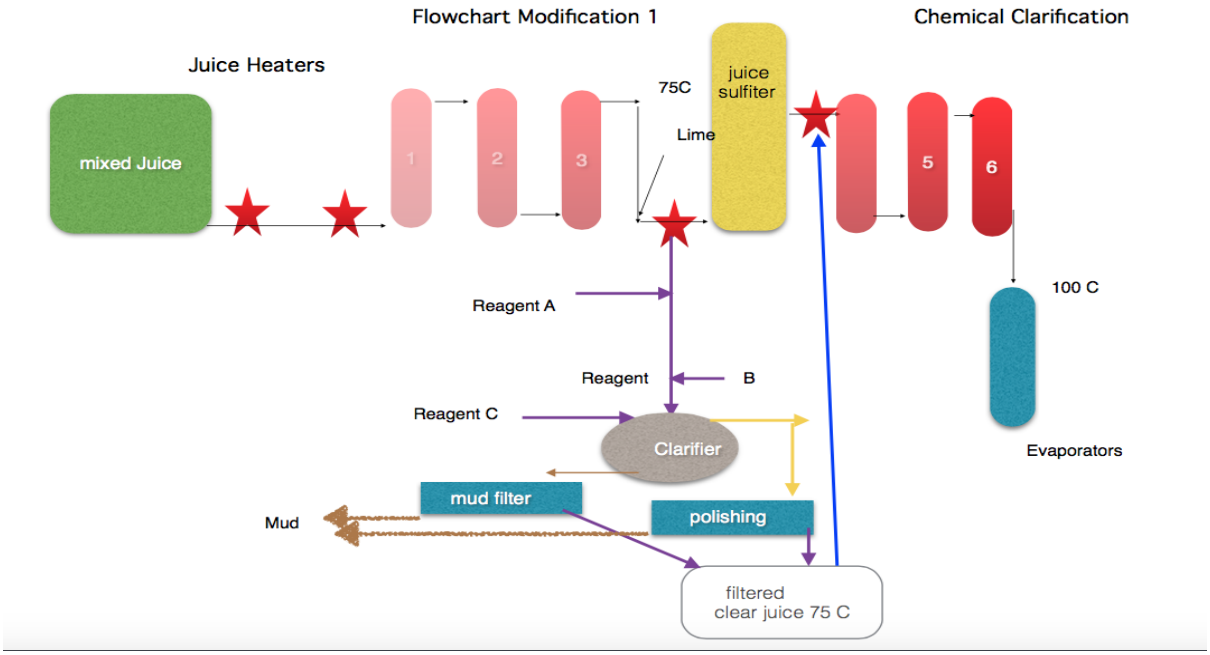


Fig :Gravity Vacuum Belt filtration system



Red star indicate elimination of various units of Juice heaters for 3 stage heating of Raw/Sulphited juice & another red star indicate elimination of Juice sulphiter

Process flow diagram including new clarifier & Belt Gravity vac.filter

Comparative statement of Inversion losses of low retention clarifier Clarifier vs regular clarifier:

Basis Considered: 2500 TCD /105 TCH. Cl. juice % cane 100 %, pol% Cl. juice 10.5 ,purity 80 ,Ph 7.0

Operating conditions : DORR 444 : Retention time 3 & half hours (210 mts). Temp.100 deg C

Clarifier 20 mts& 15 mts .Temp.75 deg C

% inversion base values from Table 32.11 of Chapter 32 of Hugot

Inversion rates from Table 32.10 of chapter 32 of Hugot

Type	**(Low retention)**	**(Low retention)**	**DORR -444**
Details	**Retention time 20 mts**	**Retention time 15 mts**	**Retention time 3 & half hrs (210 mts)**

% Sucrose inverted @ 100 deg C % Sucrose inverted @ 75 deg C	- 0.0022	- 0.0022	0.021
Inversion rate @ 100 degC Relative velocity	-	-	212 2.12
Inversion rate @ 75 degC Relative velocity	167 1.67	167 1.67	
% Inversion	0.0022 x 1.67 x 20/60 = 0.0012247	0.0022 x 1.67 x 15/60= 0009185	0.021 x 2.12 x 210/60 =0.15582
Quantity of clear juice entering the Clarifier	105 T/hr	105 T/hr	105 T/hr
Quantity of sugar entring	2500 x 0.105 = 262.5 T/day	262.5 T/day	262.5 T/day
Quantity of sugar inverted	262.5 x 0.0012247 x 24 /100 =0.077156 T/day	262.5 x 0.0009185 x 24/100 0.0578655 T/day	262.5 x 0.15582 x 24 /100 =9.817 T/day
Difference when compared to DORR 444	9.739844 T/day	9.7591345 T/day	9.817 T/day
Gain in recovery	0.3896 % cane	0.3904 % cane	Loss 0.3927 % cane
Remarks	This is the gain	This is the gain	This is the loss
Overall gain in recovery	0.3896 + 0.3927 = 0.7823	0.3904 + 0.3927 = 0.7831	

Based on similar operating conditions the recovery gain in case of 20 mts retention time is 0.7823 & in case of 15 minutes it is 0.7831

We can go for 20 mts retention time ,to consider safety factor & allowances. Because the major diff is retention time & reduction in temp.

➢ ABSTRACTS:

El Nino–Southern Oscillation influences on sugarcane production in Fiji – an exploratory investigation by Jai Gawander, Jim Salinger, Jyotika Prasad, Pedro Rounds & Renil Kumar published in International Sugar Journal October, 2018.

El Niño–Southern Oscillation (ENSO) events play a significant part in affecting agricultural productivity, in Fiji. In this study the effects of climate variability on sugarcane production in Fiji have been analyzed. Rainfall is an important factor for sugarcane production in Fiji. As rainfall is significantly affected by El Niño and La Niña which thereby affects the position and intensity of the South Pacific Convergence Zone (SPCZ) near Fiji, cane production is accordingly affected. In this study two parameters were evaluated.

Crop size and sugarcane nitrogen fertiliser requirements: Is there a link?by PJ Thorburn, J.S. Biggs, D.Skocaj, B.L. Schroeder, J. Sexton, Y. L. Everingham Renil Kumar published in International Sugar Journal October, 2018.

The Australian sugarcane industry is under pressure to reduce nitrogen (N) fertiliser applications and hence N losses to the environment. One pathway suggested to reduce N applications is to match yield targets in N fertiliser recommendations to the yields achieved by farmers. This seems a sensible strategy: smaller crops generally grown by farmers (relative to current yield targets) 'should' need less N. Is it really that simple? We collated over 150 N response curves for ratoon crops from past experiments to investigate the amount of N (Nopt) needed to achieve 95% of maximum sugarcane yield (Y95).

Host plants associated with DiatraeatabernellaDyar (Lepidoptera: Crambidae) in sugarcane in Panama by Randy Atencio, Francois-Regis Goebel & Vielka Murillo published in International Sugar Journal October, 2018.

Within the genus Diatraea, studies of alternate host plants were mainly conducted on Diatraea saccharalis (Fab.). Such information doesn't exist for Diatrae atabernella Dyar. Therefore, the objective of this study was to determine the alternative host plants of D. tabernella in sugarcane plantations in Panama. From January 2016 to February 2017, a general inventory of alternate host plants was conducted in the sugarcane field and then plants were sampled among the most frequent 9 species found (Poaceae (8) and Cyperaceae (1)) in four areas the sugarcane field (near water source (Z1), within field (Z2), near mangrove (Z3) and field.

Lamella clarifiers in sugar processing by M. Getaz published in International Sugar Journal October, 2018.

Lamella clarifiers, also commonly called inclined plate settlers, have been used for water treatment clarification since the 1970's.

The application areas of lamella clarifiers have subsequently been widely expanded and they are now used in many other application areas and industries including the pulp and paper and mining industries. This design of clarifier has now also been tested for use in the sugar industry for juice, syrup and refinery phosphatation clarification duties. The Lamella clarifier design principle takes advantage of the considerably improved performance of clarifiers incorporating inclined lamella plates.

From sugar mill to biorefinery: determining the global warming potential of upgrading a centenary factory by J.B. Melendez, T. Gardner & Y. Viera published in International Sugar Journal October, 2018.

Based on the Life Cycle Assessment (LCA) a scoping review of the Global Warming Potential (GWP) of a multipurpose sugarcane biorefinery is presented. The Mossman sugar mill was assessed as an example for its potential transformation into a multi-product factory that adds value to all by-products and crop residues. A baseline scenario (S1) was established using the current production system, which produces sugarcane, sugar, molasses and electricity. The addition of industrial units to produce ethanol from molasses (S2), single-cell protein (SCP) from vinasse (S3), and bio-naphtha/electricity from crop residues (S4) completed the four scenarios under evaluation.

Effect of pesticides on micro arthropods in sugarcane soils by D.E. Walter & G.R. Stirling published in International Sugar Journal November, 2018.

Three experiments were set up to determine whether two of the pesticides that are widely used in the sugarcane industry are detrimental to soil microarthropods. A particular focus was the effect of the pesticides on mesostigmatid mites, as they are nematophagous and help regulate populations of the nematode pests that cause damage to sugarcane. An experiment with liquid formulations of imidacloprid and bifenthrin was established at one site, while the effects of a controlled release formulation of imidacloprid were examined at two other sites.

Technical & economic comparison of different crystallization schemes by Romain Leblanc & Alexandre Gauche published in International Sugar Journal November, 2018.

In an increasingly changeable and uncertain economic context, especially with the end of sugar quotas, French plants must continue to adapt their strategies and optimize their sugar production. This challenge requires changes to the industrial tool and especially the crystallization workshop. The software BEMEIOTM (BEet plant Model for Energy and Income Optimization) makes it possible to model sugar plants with, for example, the crystallization scheme best suited to each plant in a specific economic context. It is a powerful modeling tool developed to optimize the operation and configuration of sugar plants.

Pneumatic conveying technology by Doug Carroll published in International Sugar Journal November, 2018.

Pneumatic conveyance of dry material is a proven method for moving products from place to place in many operations. However, there are multiple types of system configurations possible. Each configuration has strengths and weakness thus, the proper selection depends on the specific process needs. The following article will provide some insight into the different factors to consider when applying a pneumatic conveying solution to a process.

Effects of extraction temperature and sugar beets' origin and quality on conversion of nitrites and nitrates during sucrose extraction from by Paulina Bąka, Ilona Błaszczyka, Aneta Antczak-Chrobota & Maciej Wojtczaka published in International Sugar Journal November, 2018.

Nitrites that are primarily formed by nitrates reduction during sucrose extraction from sugar beet cossettes. A part of these compounds pass through the whole production process and accumulate in molasses. Molasses is a valuable material for the production of livestock feed, that is only temporarily excluded from the list of products subjected to the limit concerning the content of nitrites. The objective of this study was to determine the effect of temperature as well as the quality of sugar beets and region of their cultivation on reduction of nitrates to nitrites during sucrose extraction from either high quality.

Establishing extension services through a research, technology development, extension and grower continuum – a case studyby M.W. Adendorff, P.D.R. Van Heerden & A. Jumman published in International Sugar Journal December, 2018.

There is a strong link between research, effective technology exchange and social dynamics in facilitating effective adoption of new technologies in agriculture. The adoption of new technology is, however, often slow and erratic, especially in more remote and isolated communities. In this case study, the aim was to demonstrate the value of a strong multi-directional link between formal research, technology development and a strategic extension approach that takes social dynamics into consideration. In 2009, formal extension services were re-established in the Pongola sugarcane production area in South Africa.

High pressure leak prevention—improved performance and reliability from anaerobic thread sealing compounds by S. Ayadurai published in International Sugar Journal December, 2018.

Anaerobic thread sealing compounds have been available for many years and proven to be highly effective when used in a wide variety of standard pipe joints, especially when used in conjunction with tapered thread forms. This paper describes recent improvements in process reliability by developing improved performance on oiled surfaces and resistance to thermal cycling at elevated temperatures. Data are also

presented demonstrating sealing capability more than 138 MPa (20 000 psi) after one hour room temperature cure. The resultant outcome was greater plant reliability, flexibility and profitability by use of the anaerobic sealants.

Proposed best operating practices to improve technical efficiency in Brazilian sugar and ethanol plantsby F.V. Carlucci, A.P. Salgado Jnr, S.V.Lemos, M.A. Souza Jnr, F. A. Antunes & A.C.M. Duarte published in International Sugar Journal December, 2018.

The aim of this study was to propose best operating practices to improve the efficiency of sugar and ethanol plants in Brazil. Industrial technical efficiency is the main performance indicator of a sugar and ethanol mill and represents the percentage of sugarcane that is recovered and processed into sugar, ethanol and other products. Thus, given the increase in competition and the need for productivity optimisation, Brazilian milling companies need to improve their efficiency regarding the available inputs. The methodological procedures involve both quantitative and qualitative approaches. Data Envelopment Analysis (DEA) was used in order to measure the productive efficiency.

Why benefits from controlled release fertilisers can be lower than expected on some soils by K. Verburg, J.S. Biggs & P.J. Thorburn published in International Sugar Journal December, 2018.

Controlled release fertilisers (CRFs) have received increased interest by the Australian sugarcane industry as part of efforts to evaluate the use of enhanced efficiency fertilisers to reduce nitrogen (N) losses and improve N use efficiency. Experimental results and simulations, here and abroad, have shown that benefits from CRFs are dependent on soil and management conditions and are highly seasonally variable. Understanding the causes of this variability may better define where and when benefits can be expected from the use of CRFs. Here we use simulation analysis to quantify and explain the effects of soil type on agronomic and environmental.

Improved crystallization in cane sugar mills with updated strategies and equipmentby A. Lehnberger, D. Laue, S.S.Mallikarjun & H.R. Mahesh published in International Sugar Journal December, 2018.

Changing market conditions are forcing cane sugar factories to find ways of improving the quality of the produced sugar, increasing the sugar output, and, if the location permits, developing alternative uses of the bagasse besides sugar production. Numerous process details from crystallization, which are commonly applied in beet sugar factories, but not yet considered to be state of the art in the cane sugar industry, have in recent years been implemented in cane sugar factories. The achieved improvements affect different performance parameters. Progressive automation of the crystallization process combined with the production of seed massecuite by cooling crystallizationyields.

Palm Sap – Quality Profiles, Fermentation Chemistry, and Preservation Methods by

K.B. Hebbar, R. Pandiselvam, M.R. Manikantan, M. Arivalagan, Shameena Beegum& P. Chowdappa published in Sugar Tech, 2018.

Palm sap is quite nutritious and highly prone to fermentation. The unfermented juice could be an ideal health drink. Palm sap's quality profile and fermentation chemistry help to predict its shelf life and potential safety. There is demand from farmer-producer companies and food processing industries to develop bottling technology and a transportation/distribution protocol for palm sap similar to common soft drinks. Different techniques were followed for bottling palm sap, but none proved successful at the pilot level or commercial scale.

Sucrose Accumulation is Sugar Beet: From Fodder Beet Selection to Genomic Selection by Parviz Fasahat, Mohsen Aghaeezadeh, Leila Jabbari, Saeed Sadeghzadeh Hemayati & Paul Townson published in Sugar Tech, 2018.

Sucrose has been known as the main form of energy transport and storage in many economically important plant species. For the past two centuries, sugar beet has been selected as a source of sweetener in human diets for its high sucrose content. Over the past decades, sugar beet breeding has achieved significant goals in the development of taproot yield and sucrose yield. There is still scope for improvement, despite the fact that the sucrose concentration of the taproot today is around 15-20 % of the beet's fresh weight.

Pre-harvest Sugarcane Yield Estimation Using UAV-Based RGB Images and Ground Observation by Jaturong Som-ard, Mohammad Dalower Hossain, Sarawut Ninsawat & Vorraveerukorn Veerachitt published in Sugar Tech, 2018.

Sugarcane supply can vary according to the cultivation area, climatic condition, and disease. Although there are several scientific simulation models for sugarcane yield estimation, they are not widely and efficiently used due to a large number of data requirements. The success of yield estimation using remote sensing and aerial observation was limited due to the insufficient spatial requirement and spectral requirement. This study introduces a technique to use UAV-acquired RGB images coupled with ground information for reliable and fast estimation of sugarcane yield for two popular varieties (KK3 and UT 12) in Thailand.

A Standard Area Diagram Set to Aid Assessment of Ring Spot Severity in Sugarcane by Alexandre D. Roese & Henrique da S.S. Duarte published in Sugar Tech, 2018.

Sugarcane is an important global crop for fuel and energy production, and its harvested area and production have increased in Brazil over the last decade. The method of harvesting recently shifted from manual to mechanized, and it is suspected that the unburned straw left on the soil after harvesting has changed

the epidemiology of diseases caused by necrotrophic fungi, increasing their importance. Ring spot (caused by LeptosphaeriaSacchari) was considered of secondary importance, but is now more frequently observed on both old and new leaves.This study aimed to develop and validate a standard area diagram (SAD) set to help assess ring sport severity in sugarcane leaves.

Maximizing dry matter production of sugarcane through plant growth regulators under low moisture regime by Rama Kant Raj, Pushpa Singh and Rajeev Kumar published in Indian Sugar, December, 2018.

Sugarcane productivity declines under low moisture availability conditions in subtropical India. Moisture stress reduces the initial shoot population, leaf numbers, leaf area per plant, plasochorne duration, canopy coverage, stalk elongation, tillers survival, root development and ultimately numbers of millable canes. The average cane weight also gets reduced after cane harvest, which impacts the cane yield adversely.

Measurement and analysis of Total Factor Productivity growth in sugarcane crop in Western Maharashtra by Swati Choudhari, D. B. Yadav and A.J. Amale published in Indian Sugar, December, 2018.

Total factor productivity (TEP) index can be used as one measure of the effect of the technological change. TEP index that measures the growth in the net output that is not accounted for by the growth of basic factors inputs such as land, labour, and capital, but the technological change is embodied in them is superior to the partial approach, as it is a composite measure of productivity, which relates outputs to all input simultaneously.

Edited & Published by:

Dr. Ashutosh Bajpai
Prof. of Sugar Technology

For &on behalf of:
NATIONAL SUGAR INSTITUTE
Ministry of Consumer Affairs,
Food & Public Distribution
Department of Food
& Public Distribution
Kalyanpur,
Kanpur – 208017
Uttar Pradesh (India)

Visit us at
http//:nsi.gov.in

Contact:
nsikanpur@nic.in
director.nsi@gov.in
Telephone
+91-512-2570730
Fax: +91-512-2570247