October 2022 International Society of Sugar Cane Technologists Founded 1924 Bulletin

Welcome to the ISSCT Bulletin for October 2022, in which we collect latest ISSCT updates, along with news, research, and past and upcoming events related to sugar cane technology.

## Contents

**ISSCT News** ..... 3
- Webinars ..... 3
- XXXI Congress ..... 3
- XXXII "Centennial" Congress ..... 3

**Sugar Cane News** ..... 4
- Researchers identify genes potentially responsible for sugarcane's resistance to pests, cold and drought ..... 4
- Raízen, Novozymes Strengthen Partnership for Enhancing Production of Second Generation Ethanol ..... 4
- How French firm Tereos is reaping efficiency with digitization ..... 5
- Nuseed expands its bioenergy platform; acquires assets and signs long-term alliance with GranBio to accelerate global expansion of energy cane ..... 5
- BASF Launches Innovative Catalyst to Process Renewable Feedstocks ..... 6
- Two major investments for Mount Gay with sugar mill and new bond [Barbados] ..... 6
- Ethanol blending enthuses large sugar mills to step up distillery capacities [India] ..... 6
- Coalition for Sustainable Sugarcane pilot in Mexico leads to smallholder certification [Mexico] ..... 7
- Enhanced sugar production through innovative technologies pushed [Philippines] ..... 7
- Case IH introduces FieldXplorer technology for sugarcane plantations in Thailand ..... 8
- New feed-in tariff advocated for biomass energy investment in Vietnam ..... 8

**Latest Research** ..... 9

Isolation and Identification of Ruminant Bacteria for Biohydrogen Production from Sugarcane Molasses ..... 9

Integrated membrane-based processes to obtain organo-mineral fertilizer, water, and energy from sugarcane vinasse ..... 9

Technoeconomic and environmental perspectives of biofuel production from sugarcane bagasse: Current status, challenges and future outlook ..... 10

Influence of Stale Cane Seed on Productivity of Sugarcane in Semi-arid Climate ..... 10

Technical and Social – Economic Impact and Remedy of a Large-Scale Mechanized Plantation Farming on the Host Community ..... 11

Valorization of sugarcane bagasse for sugar extraction and residue as an adsorbent for pollutant removal ..... 11

Design and fabrication of semiautomatic sugarcane bud cutting machine ..... 12

A review on the valorization of lignin from sugarcane by-products: From extraction to application ..... 12

Sugarcane mild mosaic virus: The rediscovery of an identified but unrecognized virus ..... 13

Costs of Agronomic Practices: Profitability at Different Scales of Sugarcane Production in Brazil ..... 13

**Events ..... 14**

7th IAPSIT International Sugar Conference & Sugarcon-2022 ..... 14

Bonsucro Global Week ..... 14

22nd International DATAGRO Conference on Sugar and Ethanol ..... 14

25th World Ethanol & Biofuels ..... 14

31st ISO International Seminar 2022 ..... 14

ISSCT XXXI Congress ..... 15

SIT Annual Technical Meeting ..... 15

# ISSCT News

## Webinars

The series of nine webinars organised by ISSCT have been completed. The Agriculture Commission Webinar, entitled: ***Aspects of agro-ecological approaches in sugarcane farming systems*** was held as planned on Tuesday 27 September 2022. There were 69 registrants and 59 participants from 20 countries.

The last webinar organised by the Factory Processing Section, entitled***: Current Factory Processing Challenges for the International Sugar Industry*** was held on Thursday 29 September 2022. There were 70 registrants and 51 participants from 21 countries.

From feedback received from our membership it may be concluded that the ISSCT webinars have met with success as they have attracted 514 registrants from up to 21 countries. All the webinars have been recorded and are available on Cloud to the registrants until end February 2023 and the links have been provided to them.

A complete report on the Webinars will be presented at the XXXI Congress.

## XXXI Congress

A virtual meeting of the ISSCT Executive Committee and TPC together with Congress Organising Committee was held on Thursday 6 October 2022. Among the decisions taken were the extension of the Early Bird Registration period at USD 1100 from 30 September to 15 November 2022; the holding of an alternative Post-Congress Tour to a 2G Ethanol Plant in Pune, the inclusion in the programme of a panel discussion in each of the 10 disciplines in addition to the three plenary sessions on the themes: ***Growing sugarcane differently, Sugar & Health*** and ***Ethanol research and bagasse utilisation*** and the issue of **Congress Newsletter 2** by 25 October 2022. It will contain all updated information on the XXXI Congress and its associated activities including the social functions.

All present information on Congress is available on its website at: https://issctcongressindia2023.in/

## XXXII "Centennial" Congress

The preparations of the volume entitled: ***"Trends in ISSCT since its creation"*** is progressing well. Thirty-five contributors have already indicated that they will provide accounts for the 10 disciplines for the four designated periods 1924-1938;

1950-1974; 1975-1999 and 2000-2023. Replies are expected from last five of the potential contributors to complete the list of authors. The preparations of the volume dealing with the evolution of the Administration of ISSCT, its Constitution, etc have been initiated by a group of three authors. It is planned to complete the write ups of both volumes by 31 December 2023 for their completion in June 2024. A sponsor has been found for the commemorative pin which will be handed over to all participants at the Centennial Congress.

# Sugar Cane News

## Researchers identify genes potentially responsible for sugarcane's resistance to pests, cold and drought

| | | | |
|---|---|---|---|
| | **Phys.org** | **September 27, 2022** | **https://phys.org/news/2022-09-genes-potentially-responsible-sugarcane-resistance.html** |

*A study conducted at the State University of Campinas (UNICAMP) in Brazil has identified orphan genes in wild sugarcane (Saccharum spontaneum), a species with exceptional resistance to biotic stresses such as nematodes, fungi, bacteria and other pests and diseases, and abiotic stresses such as cold, drought, salinity and nutritionally deficient soil.*

*According to an article on the study published in the journal Frontiers in Plant Science, the scientists responsible had set out to see if the orphan genes in S. spontaneum played a significant role in its stress resistance properties.*

## Raízen, Novozymes Strengthen Partnership for Enhancing Production of Second Generation Ethanol

| | | | |
|---|---|---|---|
| | **AgriBusiness Global** | **September 20, 2022** | **https://www.agribusinessglobal.com/sustainability/raizen-novozymes-strengthen-partnership-for-enhancing-production-of-second-generation-ethanol/** |

*Raízen and Novozymes, leaders in the biofuel and biotechnology industries, respectively, are joining forces to develop a new generation of technologies to produce second-generation ethanol more efficiently. Their goal is to reduce the production cost, increase capacity and reduce the carbon intensity of second-generation sugars and biofuels to enable companies and nations to meet the international targets for decarbonization.*

*"The partnership with Novozymes will enable the co-development of new generations of yeast as well as more efficient enzymatic cocktails, fermentation, and hydrolysis processes. All of this will facilitate the production process of 2GE, which holds great promise for the global energy transition, with an impact on vehicles, maritime, renewable chemicals, and aviation sectors," explained Mateus Lopes, Director of Energy Transition & Investments at Raízen.*

*Through this strategic agreement, the two companies will seek to reduce their own carbon footprint and decrease the use of energy, water, and raw materials in the production of E2G. The partnership between the two companies started in 2013 when Novozymes started to exclusively supply*

| | |
|---|---|
| | *enzymes and yeast biotechnology for Raízen´s first commercial cellulosic ethanol plant.* |

## How French firm Tereos is reaping efficiency with digitization

| | | | |
|---|---|---|---|
| bnamericas | **BN Americas** | **September 30, 2022** | **https://www.bnamericas.com/en/features/how-french-firm-tereos-is-reaping-efficiency-with-digitization** |

*With 44 industrial units, operations in 13 countries, including Brazil, and 19,800 employees, French conglomerate Tereos is a global agricultural powerhouse, posting revenues of 4.3bn euros (US$4.2bn) in 2021.*

*To handle the different processes, improve agricultural monitoring, reduce costs and enhance the relationship with suppliers and the procurement chain, the company has invested heavily in automation and digitization of operations.*

*Most of these projects are in Brazil, where Tereos is among the leading producers of sugarcane and ethanol. A continuous focus on efficiency and productivity enabled gains of 12% in the 2021-22 harvest. A key focus is supply chain and procurement.*

## Nuseed expands its bioenergy platform; acquires assets and signs long-term alliance with GranBio to accelerate global expansion of energy cane

| | | | |
|---|---|---|---|
| CISION PR Newswire | **PR Newswire** | **September 13, 2022** | **https://www.prnewswire.com/news-releases/nuseed-expands-its-bioenergy-platform-acquires-assets-and-signs-long-term-alliance-with-granbio-to-accelerate-global-expansion-of-energy-cane-301622640.html** |

*Nuseed and GranBio have entered into a long-term strategic alliance to accelerate R&D and commercialization into global energy cane markets. Nuseed acquired GranBio's energy cane breeding and commercial assets, and R&D program aiming to fundamentally improve the output energy value through innovation in bioenergy cane.*

*This is an enormous opportunity, with ready now technology and is a fundamental step change in energy creation and renewable product generation from cane. The opportunity includes two exciting platforms:*

*"This is a fundamental step change in energy creation and renewable product generation from cane." Nuseed CEO*

- *Scalable, drop-in improvement in energy output with the existing ethanol + cogeneration bioelectricity cane industry in Brazil (and other markets), and*
- *Expansion of energy cane as a reliable feedstock into emerging 2G process technology, which will make it possible to help decarbonize hydrocarbons for applications such as biochemicals and Sustainable Aviation Fuel (SAF).*

*Nuseed will accelerate breeding product development and broad scale commercial adoption into the existing ethanol + bioelectric cane industry in Brazil and other world markets.*

## BASF Launches Innovative Catalyst to Process Renewable Feedstocks

| | | | |
|---|---|---|---|
| Plastics Technology | **Plastics Technology** | **October 4, 2022** | **https://www.ptonline.com/news/basf-launches-innovative-catalyst-to-process-renewable-feedstocks** |

*An innovative dehydration catalyst to process renewable feedstocks has been introduced by BASF. The star-shaped, CircleStar catalyst achieves a 99.5% selectivity for the ethanol-to-ethylene (E2E) conversion. With an operating temperature that is more than 75 F lower compared to conventional processes, CircleStar reportedly helps to decrease the carbon footprint in the bio-ethylene value chain for products ranging from jet fuel to plastics by more than 10% while maintaining the same performance.*

*This catalyst's advanced performance is attributed to its unique star shape that maximizes the active geometrical surface area for the reaction. In addition, the packed density in the reactor bed is significantly lower compared to conventionally shaped catalysts, which impacts the overall cost optimization of the reaction. The novel geometry is also said to lead to a better mass transfer and a longer catalyst lifetime due to the beneficial operation temperature and pressure-drop profile.*

## Two major investments for Mount Gay with sugar mill and new bond [Barbados]

| | | | |
|---|---|---|---|
| loop | **Barbados Loop** | **September 9, 2022** | **https://barbados.loopnews.com/content/two-major-investments-mount-gay-sugar-mill-and-new-bond** |

*Mount Gay Distillery is reaffirming its commitment to the island with massive investments into the construction of a new sugar mill and aging bond at its St Lucy plant.*

*During a recent tour of both facilities, Managing Director Raphaël Grisoni explained that the project represented an investment of over $40 million into the local rum industry.*

*"We also wanted to put our money where our mouth is and show the deep commitment that Mount Gay has in terms of investment in Barbados and investment which is leading to innovation and added value," Grisoni stated.*

*The managing director made this announcement as he addressed specially invited guests which included Minister of Industry, Innovation, Science and Technology Davidson Ishmael, Minister of Tourism and International Transport Senator Lisa Cummins and Parliamentary Representative for St Lucy Peter Phillips, along with other industry stakeholders.*

## Ethanol blending enthuses large sugar mills to step up distillery capacities [India]

| | | | |
|---|---|---|---|
| ThePrint | **The Print** | **September 27, 2022** | **https://theprint.in/economy/ethanol-blending-enthuses-large-sugar-mills-to-step-up-distillery-capacities/1145159/** |

*The Government's focus on ethanol blended petrol along with favourable policies and its multiple benefits have enthused large sugar mills to step up their distillery capacities, ICRA said in a report.*

*Additionally, while private entrepreneurs are also investing in grain-based distilleries, OMCs are investing in 2G/3G ethanol space, though at six times higher capex compared to distillery*

| | |
|---|---|
| | *capacities investments.*<br><br>*"Given the significant supply-demand mismatch and the favourable policies of the Central and a few state governments, private players are incentivised to step up molasses and grain-based distillery capacities at an investment of Rs 1.3-1.6 crore per KLPD," said Sabyasachi Majumdar, Senior Vice President & Group Head – Corporate Ratings, ICRA Limited.* |

## Coalition for Sustainable Sugarcane pilot in Mexico leads to smallholder certification [Mexico]

| | | | |
|---|---|---|---|
| | **Bonsucro** | **October 6, 2022** | **https://bonsucro.com/coalition-for-sustainable-sugarcane-in-mexico-leads-to-smallholder-certification/** |
| | *Mill Tala, which is a part of Grupo Azucarero Mexico (GAM) in Mexico, has expanded its scope of Bonsucro certification to include 25 smallholder producers. The achievement is due to a pilot program that forms part of a Coalition for Sustainable Sugarcane in Mexico – a collaboration between PepsiCo, Grupo Azucarero de México, Proforest, Bonsucro and One Peterson.*<br><br>*Mexico is one of the top 10 sugar-producing countries in the world and one of the main sugar exporting and consuming countries in Latin America – and smallholders are responsible for the majority of national production. While the crop provides many benefits to growers and local communities, it can also be associated with social and environmental risks and presents challenges such as low productivity, limited capacities around sustainable production, and a lack of financing to adopt new technologies. To address the challenges and realise opportunities, there's a need for partnership to address productivity, building financial capacity of smallholder producers and adopting technologies.*<br><br>*Out of this context, the Coalition for Sustainable Sugarcane was developed to promote sustainability in the sugarcane sector and address key sustainability challenges. This Coalition focuses on the respect for human rights across the supply chain and the implementation of regenerative agricultural practices to improve producer livelihoods and promote smallholder inclusion within sustainable supply chains.* | | |

## Enhanced sugar production through innovative technologies pushed [Philippines]

| | | | |
|---|---|---|---|
| | **SunStar** | **October 7, 2022** | **https://www.sunstar.com.ph/article/1942904/bacolod/business/enhanced-sugar-production-through-innovative-technologies-pushed** |
| | *Respnding to the call for food security in the country, Negros Occidental-based firm DC Cruz Trading Corp., through its subsidiary Dragon Drone, is pushing for an innovative technology that will help local sugarcane farmers boost their productivity.*<br><br>*DC Cruz Trading Corp. Chief Executive Officer (CEO) Ruby Tania Cruz, on the sidelines of the Dragon Drone's Showroom inauguration at Barangay Tangub in Bacolod City yesterday, October 7, said they partnered with two foreign firms, HiveGround Co. Ltd. from Thailand and Syngenta Agrichemical Company owned by a Chinese-state enterprise, to introduce a "better technology and precise agriculture" practice to farmers in the province.* | | |

| | |
|---|---|
| | *HiveGround has partnered with Dragon Drone as exclusive distributor of its sugarcane ripener technology (drone) while Syngenta will be the latter's provider of fertilizers and insecticides, among other crop protection products.*<br><br>*In the Philippines, the use of this technology is piloted in Negros Occidental which happens to be the largest producer of sugar in the country.* |

## Case IH introduces FieldXplorer technology for sugarcane plantations in Thailand

| | | | |
|---|---|---|---|
| | **AgriculturePost** | **September 12, 2022** | **https://agriculturepost.com/farm-inputs/farm-mechanisation/case-ih-introduces-fieldxplorer-technology-for-sugarcane-plantations-in-thailand/** |
| | *Precision technology has reached new heights with GPS-enabled drones now able to interact with Case IH AFS (Advanced Farming Systems) software, providing accurate and real-time intelligence to help make on-farm decisions. The technology is called FieldXplorer, and it has just been launched in conjunction with Case IH's new Austoft 9000 series sugarcane harvesters in Thailand.*<br><br>*All Austoft 9000 sugarcane harvesters are built ready with the latest innovations in sugarcane production including Case IH auto guidance, known as AFS AccuGuide. A factory-ordered option, AFS AccuGuide technology enables automatic steering of the harvester with ultimate precision along every row thanks to a high-performance AFS GPS receiver and steering controller.* | | |

## New feed-in tariff advocated for biomass energy investment in Vietnam

| | | | |
|---|---|---|---|
| | **BioEnergy Insight** | **September 14, 2022** | **https://www.bioenergy-news.com/news/new-feed-in-tariff-advocated-for-biomass-energy-investment-in-vietnam/** |
| | *Although the Vietnamese government hoped for deeper biomass energy investment through a previously-introduced feed-in tariff (FiT), some experts advise that a new one must be coupled with other legal incentives to ensure a more significant share in the country's energy mix, according to Vietnam Investment Review.*<br><br>*Since 2020 the Vietnamese government has applied FiT for biomass electricity between 7.03 and 8.47 US cents per kWh, depending on where the energy is generated. Matthias Eichelbronner, specialist of the Sustainable Bioenergy Markets (BEM) initiative via the German Development Agency, commented: "That is too low of a price and not enough to encourage the development of biomass electricity."*<br><br>*He added that many of the region's countries, such as Thailand and Malaysia, have very good FiT rates for biomass electricity. In Germany, the government has applied a very high FiT rate for biomass electricity, with the average purchase price of this energy being 19 US cents per kWh, even reaching up to 21 cents per kWh. Currently, Germany's total biomass power capacity has reached 50GW.*<br><br>*VDB is providing over $6 million in loans to Lam Son 2 Sugar Factory, coming from capital provided by the Japan International Cooperation Agency (JICA). The bank also provided more than $4.55 million for Tuyen Quang Sugar Cane Biomass Power Plant with a capacity of 25MW.* | | |

# Latest Research

## Isolation and Identification of Ruminant Bacteria for Biohydrogen Production from Sugarcane Molasses




*Biohydrogen production by fermentative bacteria is one of the most prospective alternative ways for fossil fuels. Therefore, this study aimed to isolate new facultative anerobic bacteria from cow rumen as highly hydrogen producers from sugarcane molasses. Among the isolated ruminant anerobic bacteria, the isolate RM92 was the highest hydrogen producer with maximum cumulative hydrogen (Hmax) of 426.67±14.56 mL/L. This bacterial isolate (RM92) was identified phenotypically and genotypically as Escherichia fergusonii. The 16S rRNA gene sequence was deposited in NCBI GenBank database under the accession number OP185369. Optimization expermients design for maximization of hydrogen production by E. fergusonii RM92 increased the Hmax to 1280.00 ±34.64 ml/L with maximum hydrogen production rate (Rmax) of 36.92±0.89 ml/L/h on 4% molasses sugar concentration, pH 8, incubation temperature 40 °C and initial inoculum size 30% (v/v). These findings suggest that E. fergusonii RM92 could be used as a potential hydrogen producer from cheap agro-industrial wastes.*

**Published September 5, 2022**

> Link

## Integrated membrane-based processes to obtain organo-mineral fertilizer, water, and energy from sugarcane vinasse

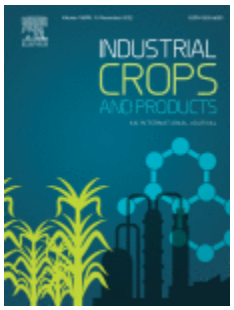



*This work presents three integrated systems to obtain organo-mineral fertilizers, water, and biogas from sugarcane vinasse. The first system (a) combined ultrafiltration (UF) and a two-stage anaerobic bioreactor (2S-AnMBR); the second (b) UF, 2S-AnMBR, and reverse osmosis (RO), and the third (c) UF and nanofiltration (NF). The reuse of RO and NF may reduce by 10.5 % the water uptake from primary sources and all systems equipped with the 2S-AnMBR presented a positive energy balance. The organo-mineral fertilizer production from vinasse membrane concentrate presented technical and economic advantages compare with raw vinasse direct application via fertigation, especially in the granulated form. Theoretically, the organo-mineral fertilizer would be capable to attain the nutritional demand of sugarcane crops, differently from what was observed in fertigation, besides the lower transportation and production cost. It was estimated an organo-mineral fertilizer production from 0.2-0.68 m3per m3 of vinasse processed, which would be capable to fertilize an area of 44,260–150,503 ha annually. The organo-mineral fertilizer production is directly linked with the flowrate of each system (raw vinasse: 527 m3/h, UF: 105.4 m3/h, NF and RO: 168,6 m3/h). Overall, both economic and environmental gains were obtained from the integrated systems, with the potential to promote a higher valorization of vinasse beyond the treatment for disposal.*

**Published: September 23, 2022**

> Link

## Technoeconomic and environmental perspectives of biofuel production from sugarcane bagasse: Current status, challenges and future outlook




*Sugarcane bagasse (SCB) is an attractive lignocellulose feedstock for biofuel production due to its high organic content and biomass yield, and ease of collection and storage. SCB-based biofuel production through the biochemical route is considered to be an eco-friendly option. However, the sustainability of this green technology is still questionable for some technoeconomic challenges associated with the pretreatment, detoxification, microbial tolerance to inhibitors, and conversion of SCB hydrolysates into biofuels. Researchers have attempted to overcome these issues, particularly by developing cost-effective pretreatment methods and engineered strains capable of tolerating inhibitors and converting SCB-derived components more efficiently. This review aims to present the current status and challenges in the conversion of SCB into biofuels like biohydrogen, biomethane, biomethanol, bioethanol, and biobutanol. The major economic and environmental perspectives are also discussed to assess the economics and eco-friendliness of SCB as the feedstocks for biofuel production. In addition, this paper also highlights existing knowledge gaps that might inspire the readers to fine-tune their research, innovations, and business plan for the development of cost-effective technologies for SCB-based biofuel production.*

**To be published November 15, 2022**

> **Link**

## Influence of Stale Cane Seed on Productivity of Sugarcane in Semi-arid Climate

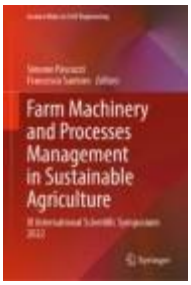
JOURNAL OF APPLIED RESEARCH IN PLANT SCIENCES

*Delayed planting of sugarcane crop after harvesting of seed is a common farming practice in all cane growing areas of Pakistan. This study was conducted to find out comparative effect of sugarcane seed having different harvesting or stalling period on productivity of sugarcane. The experiment was planted in randomized complete block design with split plot arrangement for two consecutive years. Three commercial sugarcane varieties viz. CPF 248, CPF 247 and CPF 246 were kept in main plots whereas cane setts staling; fresh, 3 days, 6 days & 9 days old stale cane setts were placed in sub-plots. The data revealed that sugarcane clones were differed significantly for most of biometric traits under study except cane yield whereas impact of cane setts stalling was also significant excluding for sugar contents. While, interactive effect of all treatment combinations for sugarcane clones and cane setts stalling was found significant except for CCS%. It was found that clone CPF 247 exhibited highest cane and sugar yield by planting fresh cane setts as against lowest for CPF 248 when planted with 9 days old stale cane setts during both years of experimentation. Better growth and yield related traits were predominantly attributed to planting of fresh cane seed having better germination, tillering and cane density.*

**Published October 10, 2022**

> **Link**

## Technical and Social – Economic Impact and Remedy of a Large-Scale Mechanized Plantation Farming on the Host Community




*Agricultural technology contributes to increase in farm productivity, additional rural employment with antecedent effect of reduction in labour and costs which eventually lower food prices, requires careful planning because it addresses multiple and conflicting objectives. Socio-economic impact on community residents can be positive or negative. This study examined technical and the socio-economic impacts over a four year take off period of a mechanized large scale sugarcane crop production making use of data obtained from 2015 to 2018 cropping seasons, Sunti, Nigeria. Adequate steps were taken to solve 12 major occurred disturbances by the host communities due to the company's presence and operations by at the government and company's levels. The Presence of the Plantation has to some reasonable extent impacted positively on wellbeing and living standard of the communities in catchment areas by employing both skilled and unskilled labour, education, skill acquisition, infrastructure sectors and community crop farming, fishing activities and overall improves their economic life. All necessary measures were put in place for the future 17,000 ha irrigable farmland plantation activities not to put the communities in dangerous environmental condition by the sugarcane cultivation and 4,500 metric tons/day sugar processing factory operations with installation of equivalent wastewater treatment plant. Values of available fleet of tractors and equipment power ratings, draft, capacity and implements selection for field cultivation operations for 2017 and 2018 cropping seasons for 1,300 ha was determined and found adequate which took into consideration precaution of negative impact of soil cultivation operation and equipment trafficability.*

**Journal published September 14. 2022**

> **Link**

## Valorization of sugarcane bagasse for sugar extraction and residue as an adsorbent for pollutant removal

frontiers

*Following juice squeezing for sugar production from sugarcane, bagasse (SCB) is usually co-produced in huge amount. This study utilized hydraulic press generated SCB as feedstock to evaluate sugar extraction as well as adsorption potential. Total soluble sugar (sucrose, glucose, and fructose) of 0.4 g/g SCB was recovered with H2O soaking. Insoluble sugar, i.e., cellulose in SCB, was further hydrolyzed into glucose (10-45%) with cellulase enzyme, generating a new bagasse (SCBE). Persulfate pretreatment of SCB proved to slightly enhance the saccharification. Both SCB and SCBE showed great potential as adsorbent, i.e., 98% MB removal by SCB or SCBE and 75% Cu2+ by SCBE and 80% by SCB in 60 min. The qm was 85.8 mg/g (MB by SCB), 77.5 mg/g (MB by SCBE), 3.4 mg/g (Cu2+ by SCB), and 1.2 mg/g (Cu2+ by SCBE). The thermodynamics indicated the adsorption process to be spontaneous, endothermic, and more random in nature. The experimental results therefore offer an alternative to better reutilize SCB.*

**Journal published August 24, 2022**

> **Link**

## Design and fabrication of semiautomatic sugarcane bud cutting machine




*Sugarcane is the prime crop of Indian agricultural market. Sugarcane resembles 80% of sugar made all across the globe. The process of harvesting of sugarcane becomes easier with the help of machines. Still there are some processes in agriculture that require special care while atomizing. Like sowing a sugarcane crop seed. This sowing of seed required careful cutting of sugarcane stalk. There are semiautomatic machines now days available for this purpose, but these machines are indirectly damaging the bud of sugarcane. To avoid this happening the design of new semiautomatic machine is presented in this research paper. The machine is designed not to harm the bud of sugarcane without compromising on its efficiency. The model cuts one bud per two second. This matches with the current machines in market with decrease in cost. This machine costs 20,360 INR. Where market survey gives cost of 40,000 INR for similar machine. Fabricated machine gives 1800 number of buds in an hour. Satisfying the performance criteria. This machine reduces the labor work of farmers which better safety at reasonable price.*

**Published: October 4, 2022**

> **Link**

## A review on the valorization of lignin from sugarcane by-products: From extraction to application




*The sugarcane industry generates several by-products including the harvest residue (straw) and the fibrous fraction following juice extraction (bagasse). The conversion of sugarcane industry by-products into value-added products is of paramount importance from a sustainable circular economy perspective. Also, the increase of second-generation bioethanol production has triggered the development of approaches to convert residues into functional bioproducts thus increasing the overall sustainability of the process. Lignin is the major biopolymer in nature, and one of the three main components of sugarcane bagasse (SCB) and straw (SCS) biomasses. Due to the potential of lignin as natural antioxidant, antimicrobial, and ultraviolet protector, lignin-based research and new product development have significantly increased. Therefore, this review aims at updating the progress on the valorization of SCS and SCB, and emphasizing their main potential bioactivities and applications, thus serving as a valuable reference material for the academy and industry. A brief introduction of the sugarcane and sugar industry in terms of by-products generation and current end-uses is presented. Recent research studies on SCB and SCS delignification techniques, lignin purification/separation and the main physical-chemical differences between SCS and SCB are covered. The most reported biological activities for sugarcane lignin and their potential applications in the cosmetic and materials fields are also detailed in this review.*

**Published: November 2022**

> **Link**

## Sugarcane mild mosaic virus: The rediscovery of an identified but unrecognized virus




*The complete genome sequence of a previously uncharacterized sugarcane-infecting virus of the genus Ampelovirus was obtained by high throughput sequencing (HTS) and rapid amplification of cDNA ends. This genome consists of 13,114 nucleotides (nt) and harbors seven open reading frames. Phylogenetic and pairwise identity analyses with the complete or near complete genome sequences of 16 isolates revealed that they all belong to a new Ampelovirus species, family Closteroviridae. These 16 isolates were distributed in three phylogenetic groups and potential recombinant events were identified for only one of these isolates. An immuno-capture-reverse transcriptase-polymerase chain reaction (IC-RT-PCR) assay was developed with antibodies previously produced against a "clostero-like" virus not yet been recognized by the International Committee on Taxonomy of Viruses but for which the name sugarcane mild mosaic virus (SCMMV) had been proposed. The new Ampelovirus was detected by IC-RT-PCR, and Sanger sequenced amplicons confirmed the identity of the virus based on HTS data. SCMMV was detected in 65 of 350 samples of quarantined sugarcane germplasm using RT-PCR targeting the hsp70 gene. These samples originated from Africa, the Caribbean, North America, South America, and Southeast Asia, thus revealing that SCMMV is present in many sugarcane-growing regions of the world. The complete or near complete sequences reported here represent the first genomic sequences for SCMMV. Furthermore, the newly developed RT-PCR diagnostic assay will facilitate the understanding of SCMMV epidemiology and will help improve management practices.*

**Published: September 30, 2022**

> **Link**

## Costs of Agronomic Practices: Profitability at Different Scales of Sugarcane Production in Brazil

Acta Académica

*The diversity in agronomic practices being used by sugarcane producers in Brazil determines differences in economic performance and cost structure. The purpose of this study is to evaluate the cost of six systems of agronomic practices using fixed or variable rates for soil amendment, fertilizer, and defensive applications and assess the profitability of these systems at three scales of sugarcane production. We then describe the data sample related to the 2019–2020 harvest season and collected from fifty-five sugarcane producers in the central-south region of Brazil. Thereafter, using a quantitative approach, a cost analysis was performed, and the cumulative frequency of the net revenue for the three scales of production (small, medium, and large), was calculated using a Monte Carlo simulation. The cost analysis indicated that fertilizer had the highest cost considering the agronomic practices adopted at the three scales of production analyzed. The cumulative frequency analysis results from the Monte Carlo simulation showed the highest net revenue per hectare for medium sugarcane producers. In addition, the presence of economies of scale was not confirmed because the lowest cost was found in small-scale sugarcane producers and the highest net revenue was obtained by medium-scale sugarcane producers.*

**Published: September 2022**

> **Link**

# Events

| | |
|---|---|
| <br> | **7th IAPSIT International Sugar Conference & Sugarcon-2022**<br>***"Sustainability of the Sugar and Integrated Industries: Issues & Initiatives"***<br>*Indian Institute of Sugarcane Research*<br>~~**16-19 February 2022**~~<br>**Postponed to 16-19 October 2022**<br>**Lucknow, India & virtual platform (for international delegates)**<br>> **Link** |
|  | **Bonsucro Global Week**<br>*Bonsucro*<br>**17-20 October 2022**<br>**Ribeirão Preto, Brazil**<br>> **Link** |
|  | **22nd International DATAGRO Conference on Sugar and Ethanol**<br>*Datagro*<br>**24-25 October 2022**<br>**Grand Hyatt São Paulo, Brazil**<br>> **Link** |
|  | **25th World Ethanol & Biofuels**<br>*Informa Connect*<br>**8-10 November 2022**<br>**Steigenberger Wiltcher's Hotel, Brussels & digital**<br>> **Link** |
|  | **31st ISO International Seminar 2022**<br>*International Sugar Organization*<br>**22-23 November 2022**<br>**East Wintergarden, Canary Wharf, London, UK**<br>> **Link** |

| | |
|---|---|
| International Society of Sugar Cane Technologists Founded 1924 | **ISSCT XXXI Congress**<br>*International Society of Sugar Cane Technologists / The Sugar Technologists' Association of India (STAI)*<br>**February 2023**<br>• ***Congress: 20-23 February***<br>• ***Pre-congress tour: 17-18 February***<br>• ***Post-congress tour 24-28 February***<br>**Hyderabad International Convention Centre (HICC), India**<br>> **Link** |
| SUGAR INDUSTRY TECHNOLOGISTS SIT | **SIT Annual Technical Meeting**<br>*Sugar Industry Technologists*<br>**7-11 May 2023**<br>**Louisiana Sugar Refining, New Orleans, USA**<br>> **Link** |