

Welcome to the ISSCT Bulletin for December 2021, in which we collect latest ISSCT updates, along with news, research, and past and upcoming events related to sugar cane technology.

News from ISSCT.....3

Message to ISSCT members.....	3
Invitation To Attend XXXI ISSCT Congress	5
Call for papers and posters – XXXI ISSCT Congress....	7

Sugar Cane News 7

Race Is On for Commercialization of Plant-based Plastic Bottle	7
Fujitsu's Blockchain Solution Applied To New Water Trading Platform To Tackle Global Water Shortages..	8
Industry Leaders Collaborating To Decarbonize Agriculture Supply Chain.....	8
Ghana turns sugarcane farming waste into organic fertilizer	9
Gold Coast building buses to run on sugarcane fuel [Australia]	9
A sweet future: Welcome to the city powered by sugar in the heart of coal country [Australia]	10
Opportunity for sugar mills to increase profitability [India]	10
Sweet tidings for farmers as scientists in Shahjahanpur develop a variety of sugarcane that is pest-resistant [India]	10
National water policy and action plan for India.....	11
First ever BIOSYRUP® Plant to be inaugurated in Maharashtra [India]	11
Bayer conducts first drone trial in agriculture in Hyderabad [India]	11
'Miwa bora' app launched to bridge gaps in sugarcane production [Kenya]	12
AFC to Provide \$200 Million for BUA's Integrated Sugar Project [Nigeria]	12
New-generation crop-spraying drones [South Africa]	13
U.S. Sues to Block Louis Dreyfus Deal to Sell Imperial Sugar.....	13

Latest Research.....13

Data-driven, early-season forecasts of block sugarcane yield for precision agriculture	13
Field-scale Assessment of Sugarcane for Mill-level Production Forecasting using Indian Satellite Data .	14
Effect of Pressure on Alkaline Pretreated Sugar	15
Cane Bagasse for Enhanced Bioethanol Production	15
Soil carbon sequestration through adopting sustainable management practices: potential and opportunity for the American countries	15
Investigation of soil nutrients and associated rhizobacterial communities in different sugarcane genotypes in relation to sugar content.....	16
Global direct nitrous oxide emissions from the bioenergy crop sugarcane (Saccharum spp. inter-specific hybrids)	17
Increases in nitrogen use efficiency decrease nitrous oxide emissions but can penalize yield in sugarcane	18
Streak mosaic caused by sugarcane streak mosaic virus, an emerging disease of sugarcane in Côte d'Ivoire	18
Comparison of the Virome of Quarantined Sugarcane Varieties and the Virome of Grasses Growing near the Quarantine Station.....	19
The dinucleotide composition of sugarcane mosaic virus is shaped more by protein coding regions than by host species.....	19
History of Sugarcane Breeding, Germplasm Development and Related Research in Myanmar ...	20
The extension services and the level of productivity of sugarcane farmers in the Visayas, Philippines.....	20

Events.....21

11th Annual Africa Sugar Conference	21
7th IAPSIT International Sugar Conference & Sugarcon-2022	21
2022 S.I.T. Orlando Conference.....	21
2022 Australian Society of Sugar Cane Technologists Conference.....	21

ISSCT Bulletin December 2021

The Dubai Sugar Conference	22
ASSCT Annual Florida & Louisiana Joint meeting.....	22
American Sugar Alliance Symposium, Seattle, WA	22
28ª Feira Internacional da Bioenergia.....	22
Sugar & Ethanol Asia	22
ISSCT XXXI Congress	22

News from ISSCT

Message to ISSCT members

Dear ISSCT Members and dear friends,

Although it's been a year with a more optimistic outlook for activities in the different sugarcane production and processing sectors, 2021 has made us face considerable professional challenges. Many of us have been personally affected by these difficult times. Field and factories processes, and research at experimental stations and universities have been greatly impacted, with many vital activities delayed. ISSCT members have had to adapt to the new circumstances with little forewarning. However, from what we have seen in many countries, our ISSCT community and the industry have proven themselves to be highly resilient. Local industries have improved production chains, adapted new technological tools, and maintained sugar and ethanol production to meet the population's needs.



Despite all of the challenges that we have faced, ISSCT managed to continue, and indeed, improve activities using the power of the Web. With the input from the Secretariat, we have started a new communication system. We now deliver a monthly Bulletin with news from ISSCT on all of its activities and reports related to the sugar industry around the world. The Executive Committee and the Technical Program Committee have continued to review the activities of ISSCT and the impact that ISSCT has made this year. We have had to make tough decisions in order to maintain the safety and protection of our members by postponing all planned sectional workshops for this year. At the same time, we had the opportunity to meet several times by using web-meeting tools and webinars. The committee members have made a firm commitment to attend these meetings no matter where they are across 15 time zones. We thank them for their dedication to ISSCT.

But there will still be rocky roads ahead as we navigate the next phase of this pandemic, from crisis management to recovery. New mutations are being identified everywhere, creating new challenges for safety and biosafety measures. These have been the focus of our deliberations for our next ISSCT International Congress, now planned to be held in India in February 2023. We look forward to seeing many of you then.

With its membership and global convening power, ISSCT will need to find useful ways to respond to the needs of the world-wide sugar industry and its members. We have identified the following seven strategic priorities: Globalization of ethanol research, Sugar and health, Organic sugar production, Sugarcane streak mosaic virus, Agroecological approaches in sugarcane farming systems, Utilization of bagasse (and green harvest residues) for alternative products and Update the guidelines for safe germplasm movement. Our goal should be to ensure that science and technological development are partners in creating a sustainable and equitable new normal for the world in which we want to live.

We and our Executive colleagues look forward to working for our members, in the new year and we hope that COVID-19 and its variants will allow us to meet in the future in near-normal circumstances. Ideally, the virtual workshops and webinars planned for 2022 and our next ISSCT XXXI Congress in India will go ahead smoothly and enable us to interact with each other.

For now, we extend my very best wishes to you and your loved ones for a safe and restful end-of-year season and a peaceful, happy and, especially, healthy 2022.

With warm regards,

Raul O. Castillo, PhD,
CHAIR ISSCT COUNCIL AND EXCO

Jean Claude Autrey, DSc,
GENERAL SECRETARY



Invitation To Attend XXXI ISSCT Congress

20-23 February 2023, HICC, Hyderabad

THE SUGAR TECHNOLOGISTS' ASSOCIATION OF INDIA



(Founded in 1925)

Recognized by The Ministry of Science & Technology, Government of India as Scientific & Industrial Research Organizations

I am pleased to announce that the XXXI Congress of the International Society of Sugar Cane Technologists (ISSCT) will be held from 20-23 February 2023 at the Hyderabad International Convention Centre, Hyderabad, India. This will be third time that India has hosted this prestigious Congress, following successful congresses in India in 1956 and 1999.



The decision to reschedule the Congress was taken during a 28 October 2021 virtual meeting of the ISSCT Executive, the ISSCT Technical Program Committee and the Congress Organizing Committee. The meeting carefully considered the

current COVID situation in India and sugar-producing parts of the world, the requirements for vaccination, and travel restrictions in India and other ISSCT member countries.

The Congress will coincide with a significant transformation of the Indian sugar industry, with many positive changes occurring in the last 4-5 years. The average Indian sugar content has increased from 10.23% to 10.70% and sugarcane yield has increased from 64.7 t/ha to 71.1 t/ha, mainly through varietal improvement. India now produces a surplus of sugar, an average of 30 Mt of sugar per year against its domestic consumption of 26.5 Mt.

With the introduction of a new environment-friendly Bio-Fuel Policy, the Indian industry is transforming itself into a hub of 'Green Energy', with a focus on ethanol, power and compressed biogas. The Indian Government has set a target of 20% ethanol blending by 2025, requiring 10500 ML of ethanol. Currently, the industry produces 6000 ML, so there are many projects in the pipeline to meet the 2025 deadline. This will soak up the excess sugar from the domestic market and pave the way for a sustainable and profitable sugar industry for years to come.

India has much to share with the ISSCT community. A detailed Congress program will be circulated to ISSCT members at the end of March 2022, following finalisation at the midterm meeting. On behalf of the Congress Organizing Committee, I cordially invite you to block out the 20-23 February 2023 to attend the XXXI ISSCT Congress in India. You will receive a link for registration very soon.

With warm regards and looking forward to seeing you in Hyderabad,

With warm regards,

Yours truly,

SANJAY AWASTHI

VICE CHAIRMAN

CONGRESS ORGANIZING COMMITTEE

Call for papers and posters – XXXI ISSCT Congress

The 2023 ISSCT Congress will be held in Hyderabad, India, during 20-23 February 2023. Now is the time to start thinking about preparing and presenting a paper or poster.

The ISSCT Technical Program Committee has defined the following dates:

- **28 February 2022** – Deadline for emailing the title and outlines for full-length and poster papers to the Editor at issct.editor@bigpond.com using the Intent to Submit form available on the ISSCT website.
- **15 April 2022** – Authors have received confirmation to proceed to prepare the paper/poster.
- **15 June 2022** – Deadline for receipt of the manuscripts of full-length papers and posters.
- **30 November 2022** – Deadline for finalisation of all papers and posters. Any received after this deadline will not be included in the proceedings and will not be accepted for presentation at congress.
- Download: [ISSCT Intent to submit](#)

Full Instructions to Authors will be sent following receipt of the Intent to Submit.

- Download: [ISSCT Instructions to author](#)

Sugar Cane News

Race Is On for Commercialization of Plant-based Plastic Bottle

	Plastics Today	December 3, 2021	https://www.plasticstoday.com/packaging/race-commercialization-plant-based-plastic-bottle
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	<p>Japan's Suntory Group has created a prototype Orangina bottle made entirely from plant-based materials. Meanwhile, Coca-Cola said its 100% plant-based plastic bottle is ready for commercial-scale production.</p> <p>The so-called "plant bottle" has been a long time coming, and it's still not really here, but Japan's Suntory Group and the Coca-Cola Co. are inching closer to getting it into the hands of thirsty consumers.</p> <p>Suntory said that it has achieved a milestone by creating a prototype PET bottle entirely from 100% plant-based materials. The prototypes were produced for the Orangina brand, which Suntory owns in most of the world except the United States, where it belongs to Keurig Dr Pepper, and its mineral water, Suntory Tennensui.</p> <p>The bMEG process, which Coca-Cola co-owns with Changchun Meihe Science & Technology, has also been streamlined and reportedly allows for various types of renewable materials to be used for feedstock. Coca-Cola explained that bMEG typically is produced by converting sugarcane or corn into bioethanol as an intermediate, which is subsequently converted to bioethylene glycol. Now, sugar sources can directly produce MEG, resulting in a simpler process. UPM, the technology's first licensee, is currently building a full-scale commercial facility in Germany to convert certified, sustainably sourced hardwood feedstock taken from sawmill and other wood industry side-streams to bMEG.</p>
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Fujitsu's Blockchain Solution Applied To New Water Trading Platform To Tackle Global Water Shortages

	<p>Eurasia Review</p>	<p>November 18, 2021</p>	<p>https://www.eurasiareview.com/18112021-fujitsus-blockchain-solution-applied-to-new-water-trading-platform-to-tackle-global-water-shortages/</p> <p>With global water supplies under severe pressure from climate change and growing worldwide demand, Fujitsu and Botanical Water Technologies (BWT) signed an agreement and initiated the creation of a blockchain-based water trading platform, "Botanical Water Exchange" (BWX), on November 8, 2021. Fujitsu will help businesses achieve sustainability commitments and alleviate water shortages through the development of the world's first water trading platform for the exchange of plant-derived water, which is based on the concept of sustainable water offsetting.</p> <p>BWT leverages its patented technology to purify and re-mineralize water that is normally discarded during the production of vegetable and fruit juices and the processing of sugarcane, providing this plant-derived purified water to areas where it often proves difficult to secure safe drinking water.</p>
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Industry Leaders Collaborating To Decarbonize Agriculture Supply Chain

	<p>Urban Ag News</p>	<p>November 23, 2021</p>	<p>https://urbanagnews.com/blog/news/Industry-leaders-collaborating-to-decarbonize-agriculture-supply-chain/</p> <p>BRF, Raizen, Rumo, AMAGGI and SINAI Technologies, announced today a first-of-its-kind</p>
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collaboration to collect, calculate, forecast and share primary emissions data across the global supply chain to drive industry mitigation and decarbonization.

Through this collaboration, the companies reinforce commitments to the global agenda, understanding that engagement is essential to reach decarbonization. This is the first time – in any industry – for a collaborative initiative with the shared goal of identifying decarbonization opportunities throughout all supply chain operations. While this first partnership focuses on the agriculture industry, the goal is to accelerate the deployment of low carbon solutions across any and all supply chains.

These companies will connect emissions from seed processing to agricultural production, trading, logistics, feed and food production and operation, and finally distribution from Brazil to global markets using SINAI Technologies’ decarbonization platform. From a consumer perspective, this yields the potential to see carbon-neutral food products available at your local supermarket.

Ghana turns sugarcane farming waste into organic fertilizer

	DW.com	November 12, 2021	https://www.dw.com/en/ghana-turns-sugarcane-farming-waste-into-organic-fertilizer/a-59730966
	<p><i>In Ghana, sugarcane was once big business. But around 40 years ago, the industry started to decline, and today, all the country's large factories are closed.</i></p> <p><i>But that major downturn didn't stop Audrey S-Darko from wanting to know more. Together with other students, she founded the Sabon Sake project and got in touch with small farmers who mainly grow sugarcane. Using biotechnology in her university's laboratory, the young Ghanaians developed a bio-compost fertilizer from sugarcane waste that could ensure better soil quality.</i></p>		

Gold Coast building buses to run on sugarcane fuel [Australia]

	Government News	November 8, 2021	https://www.governmentnews.com.au/gold-coast-building-buses-to-run-on-sugarcane-fuel/
	<p><i>Two buses will soon hit the road as part of a 12-month trial to be rolled out across the Mackay bus network.</i></p> <p><i>In the Queensland-first trial, the buses will be built by Gold Coast manufacturer BusTech and will run on bioethanol fuel produced from locally-grown sugarcane in Mackay.</i></p> <p><i>The trial is being funded by Scania, a Swedish manufacturer of commercial vehicles, and the Queensland Government.</i></p>		

A sweet future: Welcome to the city powered by sugar in the heart of coal country [Australia]

	ABC	November 17, 2021	https://www.abc.net.au/news/rural/2021-11-17/powerd-by-sugar-in-the-heart-of-coal-country/100620746
<p><i>In the heart of Queensland's coal country, a large regional city is increasingly powered by another enterprise — sugar cane. Mackay is a well-known hub for the nearby central highlands coal mining industry. But for all the political posturing over the local resources sector, this coal town's electricity is already 30 per cent powered by renewables. The diversification was not an intentional shift; it comes from a by-product of Mackay's other biggest industry, sugar..</i></p>			

Opportunity for sugar mills to increase profitability [India]

	Research Matters	November 16, 2021	https://researchmatters.in/news/opportunity-sugar-mills-increase-profitability
<p><i>Vasantdada Sugar Institute (VSI) recently developed a new process to make lactic acid from bagasse at laboratory scale. The process includes four stages: pre-treatment, hydrolysis, fermentation and separation or purification. The pre-treatment of the bagasse is done using sodium hydroxide; the treated bagasse is then hydrolysed with the help of hydrolytic enzymes.</i></p> <p><i>The dissolved fraction from this step is used as a raw material for bacterial fermentation to produce lactic acid. Excess calcium carbonate is added into the fermentation broth to lower its acidity and extract lactic acid in the form of calcium lactate which is further purified to produce 99.9% lactic acid. The process also produces gypsum as a by-product, which finds application in the cement industry.</i></p>			

Sweet tidings for farmers as scientists in Shahjahanpur develop a variety of sugarcane that is pest-resistant [India]

	GaonConnection	October 28, 2021	https://en.gaonconnection.com/farmers-scientist-shahjahanpur-sugarcane-pest-resistant-red-rot-uttar-pradesh/
<p><i>Uttar Pradesh Council of Sugarcane Research, Shahjahanpur, has developed a variety of sugarcane that is pest resistant and may be the answer to the red rot disease. The new variety, KoSha 13235, is being distributed to the farmers through sugarcane cooperatives and they in turn are being encouraged to share it with fellow farmers.</i></p> <p><i>Uttar Pradesh Council of Sugarcane Research, Shahjahanpur, has developed a variety of sugarcane that is pest resistant and may be the answer to the red rot disease. The new variety, KoSha 13235, is being distributed to the farmers through sugarcane cooperatives and they in turn are being encouraged to share it with fellow farmers.</i></p>			

National water policy and action plan for India

	The Times of India	November 8, 2021	https://timesofindia.indiatimes.com/blogs/truth-lies-and-politics/national-water-policy-and-action-plan-for-india-2020-part-1/
<p><i>Water is the very basis of life and is the foundation for human survival and development. Sustainable and equitable use of water over millennia has been ensured by cultural adaptation to water availability, through water conservation technologies, agricultural systems and cropping patterns, adapted to different climatic zones, and conservation-based life styles.</i></p> <p><i>However, in the last few decades, the increase in population, increased pace of industrialisation and urbanisation, along with the influence of consumerist culture, have interfered with the natural hydrological cycle of rainfall, soil moisture, groundwater, surface water and storage of all sizes. We have accordingly witnessed overuse, abuse and pollution of our vital water resources, which has disturbed the quality of water, and the natural cleansing capacity of water. It needs to be noted that, in India, water consumption for irrigation accounts for 80-90 per cent. Of this, 80 per cent water is consumed by just three crops, rice, wheat and sugarcane.</i></p> <p><i>It is reported, water shortages are already acute, as nearly half of the country's population faces high-to-extreme water stress, and about 200,000 die each year due to inadequate access to safe water. A Committee, headed by Mihir Shah, a noted Water Policy Expert and a former Planning Commission Member, has submitted its report to the Union Ministry of Jal Shakti. The Ministry is currently going through the Draft Policy before finalising and adapting it.</i></p>			

First ever BIOSYRUP® Plant to be inaugurated in Maharashtra [India]

	ChiniMandi	December 2, 2021	https://www.chinimandi.com/first-ever-biosyrup-plant-to-be-inaugurated-in-maharashtra/
<p><i>There is an opportunity for the sugar sector to maximize revenue by diverting excess sugar. In EBP 18 & subsequent measures taken, Sugarcane juice/syrup has come up with prominence offering the highest ethanol rate & achieving diversion of excess sugar hence maximizing the revenue. However, syrup is seasonal feedstock and being a perishable feedstock have availability issues for round the year operation.</i></p> <p><i>BIOSYRUP® Technology is an innovative technology solution (patent) from Praj Industries Ltd. that offers storage of syrup for round the year, allowing the sugar sector to offer syrup based ethanol even in off-season, increasing production capacity, diverting excess sugar & maximizing revenue.</i></p>			

Bayer conducts first drone trial in agriculture in Hyderabad [India]

	Business Standard	November 23, 2021	https://www.business-standard.com/article/companies/bayer-
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			conducts-first-drone-trial-in-agriculture-in-hyderabad-121112301219_1.html
			<p><i>Bayer CropScience Ltd on Tuesday said it has conducted its first drone trial at its multi-crop breeding centre in Chandipa, near Hyderabad.</i></p> <p><i>Sharing a message on this occasion, Union Agriculture Minister Narendra Singh Tomar said: I'm really happy to learn that Bayer is organising a pilot project on the use of drones in agriculture".</i></p> <p><i>India is making giant strides in technology and digitalisation, and adopting these for enhancing agricultural purposes is a step forward in the government's efforts to provide a strong impetus to farmers' prosperity, the company quoted the minister as saying in a statement.</i></p>

'Miwa bora' app launched to bridge gaps in sugarcane production [Kenya]

			https://www.the-star.co.ke/counties/nyanza/2021-12-02-miwa-bora-app-launched-to-bridge-gaps-in-sugarcane-production/
	The Star	December 2, 2021	<p><i>Sugarcane farmers expect improved production following the launch of the 'Miwa Bora' app by the Sugar Directorate as part of efforts to revive the industry.</i></p> <p><i>Agriculture and Food Authority acting director general Kello Harsama said the application is geared towards providing information to farmers on matters of sugar and its by-products.</i></p> <p><i>With the current ratio of extension officers to farmers at 1:3,760, way below the recommended 1:400, he said the app has been developed to bridge the gap by providing farmers with the required information.</i></p>

AFC to Provide \$200 Million for BUA's Integrated Sugar Project [Nigeria]

			https://www.businesswire.com/news/home/20211207005576/en/AFC-to-Provide-200-Million-for-BUA%E2%80%99s-Integrated-Sugar-Project
	BusinessWire	December 7, 2021	<p><i>Africa Finance Corporation (AFC), Africa's leading infrastructure solutions provider, has approved a US\$200 million corporate facility for BUA Industries Limited, a member of the BUA Group (BUA), to complete its vertically integrated sugar facility in Lafiagi, Kwara State, Nigeria.</i></p> <p><i>The proceeds will be utilised for the development, construction, commissioning and operations of a 20,000 hectares plantation, 2,200,000 tons sugar milling plant and a 200,000 tons per annum sugar refinery that will process and refine white sugar. The facility will also have an ethanol plant that should produce 25 million litres of ethanol annually and a 35-megawatt power plant that will produce renewable energy from bagasse – sugarcane residue (the Lafiagi Sugar Project or the Project).</i></p>

New-generation crop-spraying drones [South Africa]

	Farmer's Weekly	November 30, 2021	https://www.farmersweekly.co.za/agri-technology/machinery-equipment/new-generation-crop-spraying-drones/
	<i>To Tim Wise, whose sugar cane-growing family had always battled with the quality of crop spraying delivered by aeroplane, drones seemed to be a workable alternative. This led to research into drone technology in 2016, and the subsequent creation of Precision Agricultural Systems. The company has since been the driving force in having crop-spraying drones approved for commercial use in South Africa.</i>		

U.S. Sues to Block Louis Dreyfus Deal to Sell Imperial Sugar

	Bloomberg	November 23, 2021	https://www.bloomberg.com/news/articles/2021-11-23/u-s-sues-to-block-louis-dreyfus-deal-to-sell-imperial-sugar
Bloomberg	<i>U.S. antitrust officials sued to block Louis Dreyfus Co.'s deal to sell its Imperial Sugar unit to closely-held U.S. Sugar.</i>		
	<i>The Justice Department said in a statement Tuesday that the tie-up would leave 75% of refined sugar sales across the Southeast in the hands of just two mega-producers, leading to higher prices.</i>		

Latest Research

Data-driven, early-season forecasts of block sugarcane yield for precision agriculture

*The Australian sugar industry is heavily regulated for on-farm inputs due to nutrient-rich runoff which flows into the Great Barrier Reef. Variable rate application of N fertiliser allows sugarcane (*Saccharum spp.*) growers to optimise the use of limited resources and match crop needs in space and time. This study outlines an approach and the merits of a data-driven, site- and season-specific forecast of yield at the block (field) resolution, by using publicly available spatio-temporal data such as satellite imagery, radiometrics, weather, and terrain attributes, in tandem with commonly available grower and mill data, namely yield, ratoons, harvest dates.*



The study used harvest data collected from two sugarcane properties (380 ha) in the Isis District of Queensland, between 2007 and 2018. Yield forecasts were produced with random forest models at two key management points in the season; early- (1 December) and late-season (1 June). Using a robust leave-one-season-out cross-validation technique, sugarcane yield could be forecasted early-season with a Lin's concordance correlation coefficient (LCCC) of 0.61 and root-mean-square error (RMSE) of 32.1 t ha⁻¹, with an improvement later in the season with 0.63 LCCC and 30.9 t ha⁻¹ RMSE. Accurate early-season forecasts of yield at fine spatial supports offers growers the opportunity to make better-informed decisions regarding crop nutrition.

This leads to more targeted and accurate applications of fertiliser, improving on-farm profitability, and critically decreasing off-site environmental damage to the Great Barrier Reef. The cost-effective, widely-applicable and scalable forecasting approach described in this case study could be expanded to a regional or industry scale, providing benefits to all industry stakeholders.

Journal to be published: 1 February 2022, article available now

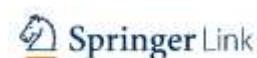
> [Link](#)

Field-scale Assessment of Sugarcane for Mill-level Production Forecasting using Indian Satellite Data

*Estimating sugarcane (*Saccharum officinarum* L.) production at micro-scale prior to harvest is required for fixing of Fair and Remunerative Price (FRP) payable by sugar factories, levy price of sugar and its supply for public distribution systems and regulating supply of free-sale sugar. This may also help the sugar mill owners to plan for crushing the expected cane biomass, estimate the production of sugar in each mill and look for opportunities to sell or buy from nearest sugar mills if expected production is more or less than factory's crushable capacity. A pilot-scale study was carried out in four sugar mills of Gujarat and Maharashtra states during 2017–2019 period. Multi-date multispectral data from LISS IV, LISS III of Resourcesat-2&2A, GPS and mobile-based ground truth data and Crop Cutting Experiment data (CCE) were used. Crop discrimination in the form of fresh and ratoon, field-scale crop health assessment, yield-model development and mill-level crop acreage and production estimation were carried out. LISS IV data along with error-free GPS-based polygons could lead to discrimination with 95% accuracy and between 88–91% with mobile-based point locations. The mill-level production was found to have less than 10% deviation from reported production. The field-scale assessment and enumeration could lead to mill-level crushable cane production forecast 2 months before harvest. Future efforts are needed to utilize agro-met products and SAR-based metrics to improve the production forecasting.*

Published: 1 December 2021

> [Link](#)



Effect of Pressure on Alkaline Pretreated Sugar Cane Bagasse for Enhanced Bioethanol Production



*Global warming has become a major concern as a result of the excessive release of greenhouse gas emissions. An important strategy for achieving carbon neutrality targets is to focus on renewable energy resources. Second generation bioethanol synthesis via sugarcane bagasse (SCB) is another promising approach for the reduction of greenhouse gas emissions. Here in, this study presents the second generation of bioethanol production from sugarcane bagasse with the pretreatment condition adjoined with basic hydrogen peroxide and pressure effect by fermentation using microorganisms *Saccharomyces Cerevisiae* and *Bacillus Subtilis*. The results revealed better production through pretreatment at different operational stages through batch fermentation. Different characterization techniques including Scanning Electron Microscopy (SEM), Fourier Transform Infra-Red (FTIR), High Performance Liquid Chromatography (HPLC), and Thermogravimetric Analysis (TGA) results confirmed the better effects of structural changes of hemicellulose, lignin, and cellulose during treatment, weight loss, thermal stability and higher concentration of the produced bioethanol in the distillate. After pretreatment, the conversion of biomass to bioethanol by using *Saccharomyces Cerevisiae* gives a high production yield (70%), which presents a production of 70g/L from 100g of SCB at the end of 72 h and a yield of bioethanol (0.7g/g) of SCB confirmed through gas chromatography/mass spectrometry qualitative analysis (GC/MS). The pretreatment conditions of alkaline hydrogen peroxide (H₂O₂) were optimized to the values 3h, 50°C, 60 psi, pH 8.6, and 150 rpm. This study sheds light on the effects of pretreatment conditions for bioethanol production from sugarcane bagasse.*

Published: 3 December 2021

> [Link](#)

Soil carbon sequestration through adopting sustainable management practices: potential and opportunity for the American countries



Soils represent an important carbon (C) pool, being the large sink among the terrestrial ecosystem compartments. However, intensive use of the soils to meet the growing demand for food, fiber and energy has caused soil C losses and consequently, the emissions of greenhouse gases (GHG). For this reason, sustainable soil C sequestration practices and well-oriented political agendas need to be scaled up to regional and national levels to contribute to climate change mitigation and food security. In 2020, the Inter American Institute for Cooperation on Agriculture (IICA) and the Carbon Management and Sequestration Center at The Ohio State University (CMASC) launched the Living Soils of the Americas (LiSAM) initiative.

The LiSAM is an extensive network involving governments, international

organizations, universities, the private sector and civil society organizations that will join efforts to curb land degradation and thereby promote soil health, C sequestration and other associated benefits to people. In seeking to provide first data-tools for the LiSAM initiative in the American hemisphere, we prepared the present document with the main methodologies used for measuring soil C stocks and GHG emissions in the field, current land use and soil C stocks, and potential soil C sequestration by adopting sustainable management practices. As a result, we found that pasture is the most widespread agricultural use of land in the Americas, accounting for $9.05 \text{ km}^2 \times 10^6$ (905 million ha). Pasture surface area is three times larger than that of agriculture (croplands), accounting for $3.40 \text{ km}^2 \times 10^6$. Soybean ($0.91 \text{ km}^2 \times 10^6$), maize ($0.72 \text{ km}^2 \times 10^6$) and wheat ($0.35 \text{ km}^2 \times 10^6$) are the most cultivated annual crops, sugarcane ($0.14 \text{ km}^2 \times 10^6$) is the main semiperennial crop, and coffee ($0.05 \text{ km}^2 \times 10^6$) is the main perennial crop. For the soil C stocks, we estimated an average accumulation of 51.28 Mg ha^{-1} in the entire hemisphere for the 0-30 cm layer. Among the different regions, Central America (63.30 Mg ha^{-1}), the Caribbean (61.35 Mg ha^{-1}) and North America (53.91 Mg ha^{-1}) showed the highest soil C stocks; only in South America the soil C stock (48.11 Mg ha^{-1}) was below the mean established for the entire continent. Several approaches to assessing soil C sequestration and GHG emissions were presented and discussed, ranging from site-specific field measurements to mathematical tools and simulation models.

Lastly, we identified some promising sustainable management practices that could be adopted across the Americas, such as no-tillage, cover crops, organic amendments, pasture restoration through integrated systems (i.e., silvopastoral and integrated crop-livestock-forest systems), forest restoration, among others. Based on our estimate, adopting only two large-scale sustainable management practices (i.e., pasture reclamation and conservation tillage) the potential soil C accumulation in the countries of the Americas is about 2.68 Pg C ($1.25 - 4.11 \text{ Pg C}$), representing a total of $9.81 \text{ Pg CO}_2\text{eq}$. ($4.56 - 15.06 \text{ Pg CO}_2\text{eq}$) over 20 years. It represents a potential to mitigate about 7.9% (3.7 - 12.2%) of the total annual global net anthropogenic GHG emissions due to agriculture and 4.1% (1.9 - 6.3%) of global emissions due to agriculture, forestry, and other land use. Faced with the information provided in this document, we believe that sustainable management practices suggested by the LiSAM initiative can guide new protocols for curbing land degradation, promote soil health and soil C sequestration in the Americas.

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> [Link](#)

Investigation of soil nutrients and associated rhizobacterial communities in different sugarcane genotypes in relation to sugar content

Plant microbiomes and soil are bridged by rhizobacteria, maintaining and improving plant health and growth in different aspects.



This study was conducted in the field station of the Guangxi University, Fusui, China. We investigated soil nutrients, root morphology and rhizosphere bacterial composition, and community structures in 18 sugarcane genotypes concerning sugar content under the same environmental condition.

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> [Link](#)

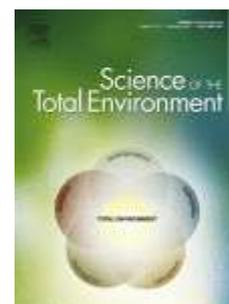
Global direct nitrous oxide emissions from the bioenergy crop sugarcane (*Saccharum* spp. inter-specific hybrids)

Sugarcane is the second largest bioenergy crop in the world and it accounts for 80% of global sugar production. Grown mostly in wet and warm tropics with relatively high nitrogen (N) fertiliser input and crop residue retention, sugarcane production is a significant source of nitrous oxide (N₂O) emission. Yet, a global evaluation of research on N₂O emission from sugarcane crop is lacking. Here, we conducted a meta-analysis using data from 141 measurements compiled from 15 sugarcane field studies reported from different countries to i) quantify N₂O emissions and emission factors (EFs) globally, and for tropics and sub-tropics, and ii) identify the key factors that promote N₂O emission. Our analysis shows that the global mean total N₂O emission from sugarcane production reached 2.26 (CI: 1.93–2.62) kg N₂O-N ha⁻¹ yr⁻¹ with an estimated EF of 1.21% (CI: 0.971–1.46%). N₂O emissions increased exponentially with increase in N fertiliser rate, questioning the adequacy of Intergovernmental Panel on Climate Change (IPCC) default EF value (1%) for sugarcane N₂O emission estimation. Mean total N₂O emissions and EFs in tropics and sub-tropics did not vary significantly. Supplementing synthetic N fertiliser (SN) with organic amendments (OA) significantly increased mean N₂O emission (-1.4-fold) and EF (-2.5-fold) compared to SN.

A remarkable reduction in N₂O emission (38.6%) and EF (61.5%) was evident when enhanced efficiency fertilisers (EEF) replaced SN. In contrast, crop residue removal had little impact on N₂O emission and EF, but both parameters showed an upward trend with irrigation and increased rainfall. Soil carbon content and pH were emerged as key regulators of sugarcane N₂O emission and EF. It is concluded that global sugarcane N₂O emission could be significant and that there is considerable prospect for mitigating the emission through innovative nutrient formulations and precision agriculture that help meet crop nutrient demand without compromising environmental imperatives.

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> [Link](#)



Increases in nitrogen use efficiency decrease nitrous oxide emissions but can penalize yield in sugarcane

Nitrogen (N) fertilization strategies focused on increasing nitrogen use efficiency (NUE) and decreasing nitrous oxide (N₂O) emissions are important for sustainable crop production. In sugarcane, however, a joint assessment of NUE, N₂O emissions and yield is still required. We aimed to establish, in a subtropical sugarcane cropping system, if variations in NUE (by decreasing rates or changing formulations of N fertilization) allow decreasing N₂O emissions and, to what extent, yield is penalized. Four fertilization treatments were used: without fertilizer, with low and high urea fertilization (55 and 110 kg N ha⁻¹) and with ammonium nitrate fertilization (110 kg N ha⁻¹). There was a significant negative relationship between N₂O emissions and NUE. At high N rates (110 kgN ha⁻¹) ammonium nitrate produced 37% higher cumulative N₂O emissions and 13 and 12% lower NUE and cane yield, respectively, than urea. The highest N₂O emissions of the ammonium nitrate treatment occurred within 48 hs after N fertilization and were mainly associated with the direct addition of nitrate (NO₃⁻-N). Results showed that, for the environmental conditions of Tucuman (Argentina), NUE above 160 kg of cane per kg of N available in soil penalized cane yield, whereas NUE below 140 kg of cane per kg of N available in soil penalized N₂O emission abatement.

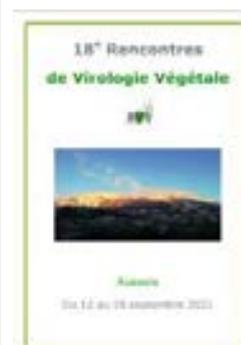
Published: 30 November 2021

> [Link](#)



Streak mosaic caused by sugarcane streak mosaic virus, an emerging disease of sugarcane in Côte d'Ivoire

The distribution of sugarcane streak mosaic virus (SCSMV), the causal agent of sugarcane streak mosaic, was restricted to Asia-Oceania until the end of the 2010s when this virus was first reported in Africa (Côte d'Ivoire). Streak mosaic symptoms include longitudinal yellowish-green streaks (3-40 mm long) and light and dark green islands on the leaf lamina. These symptoms affect leaf photosynthesis and consequently result in reduced growth of infected sugarcane plants. SCSMV can be detected in symptomatic and asymptomatic stalks using several serological and molecular methods, including tissue blot immunoassay and RT-PCR. Metagenomic analyses of symptomatic plants did not reveal putative co-infecting viruses contributing to disease symptoms. In 2018, disease occurrence reached 95% in some commercial fields and almost 100% in nurseries of one estate of Côte d'Ivoire. Yield losses up to 70% were estimated in highly susceptible cultivar R575. SCSMV is transmitted by infected cuttings (stalk pieces) and most likely also by an insect vector that remains to be identified. SCSMV is a poacevirus of the Potyviridae family and the genome of several isolates of this viral species has been fully sequenced. Phylogenetic analyses revealed that SCSMV isolates from Côte d'Ivoire and other sugarcane growing locations in Asia-Oceania belong to several phylogroups. The biological significance of this genetic variation needs to be investigated to optimize screening for disease resistance. Future research will focus on the epidemiology of sugarcane streak mosaic in Côte d'Ivoire, with special emphasis on identification of the insect vector, host range, and variation in virulence of SCSMV.



Published: September 30, 2021

Comparison of the Virome of Quarantined Sugarcane Varieties and the Virome of Grasses Growing near the Quarantine Station

Visacane is a sugarcane quarantine station located in the South of France, far away from sugarcane growing areas. Visacane imports up to 100 sugarcane varieties per year, using safe control and confinement measures of plants and their wastes to prevent any risk of pathogen spread outside of the facilities. Viruses hosted by the imported material are either known or unknown to cause disease in cultivated sugarcane. Poaceae viruses occurring in plants surrounding the quarantine glasshouse are currently unknown. These viruses could be considered as a source of new sugarcane infections and potentially cause new sugarcane diseases in cases of confinement barrier failure. The aim of this study was to compare the plant virome inside and outside of the quarantine station to identify potential confinement failures and risks of cross infections. Leaves from quarantined sugarcane varieties and from wild Poaceae growing near the quarantine were collected and processed by a metagenomics approach based on virion-associated nucleic acids extraction and library preparation for Illumina sequencing. While viruses belonging to the same virus genus or family were identified in the sugarcane quarantine and its surroundings, no virus species was detected in both environments. Based on the data obtained in this study, no virus movement between quarantined sugarcane and nearby grassland has occurred so far, and the confinement procedures of Visacane appear to be properly implemented.

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> [Link](#)

The dinucleotide composition of sugarcane mosaic virus is shaped more by protein coding regions than by host species

Sugarcane mosaic virus (SCMV), which belongs to the Potyvirus genus of the family Potyviridae, causes mosaic diseases in canna, sugarcane and maize worldwide.

Previously, the genetic variations, timescale, codon usage patterns and host adaptations of SCMV were determined. However, the dinucleotide composition and the dinucleotide bias from hosts or the protein coding regions of the virus have yet to be investigated. In this study, comprehensive analyses of the dinucleotide composition and dinucleotide bias from hosts, lineages and protein coding regions of SCMV were performed using 131 complete genomic sequences.

We found that UpG and CpA were largely overrepresented while UpA, CpC, and CpG were largely underrepresented in the polyprotein and 11 protein coding region data sets. SCMV dinucleotide composition bias is more strongly dependent on the protein coding regions than on hosts. A weak association between the dinucleotide composition and SCMV



lineages was also observed. Our analysis provides a novel perspective on the molecular evolutionary mechanisms of SCMV and may provide a better understanding of future research on the origin and evolutionary patterns of SCMV.

Journal to be published: January 2022, article available now

> [Link](#)

History of Sugarcane Breeding, Germplasm Development and Related Research in Myanmar

Sugarcane is one of the four major crops of Myanmar, and its breeding and related research has begun with the establishment of Pyinmana Central Farm, Naypyitaw, in 1925. The key objectives of sugarcane breeding program in Myanmar are to produce sugarcane varieties with improved cane and sugar yield, good ratooning ability and resistance to locally important pests and diseases.

Varietal improvement programs now conduct both introduction and selection of foreign varieties suitable for local growing conditions, and hybridization and selection. On average, it takes 11 years to release a variety for commercial planting under this program. So far, seven locally bred varieties, called PMA varieties (five) and DAR varieties (two), were released between 2004 and 2019. Application of biotechnology for variety improvement is very limited.

Progress in sugarcane breeding in Myanmar will largely depend on international cooperation and continuation of germplasm exchange and technical capacity building.

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> [Link](#)



The extension services and the level of productivity of sugarcane farmers in the Visayas, Philippines

Agricultural extension has been an essential strength in agricultural development and social innovation factor. Contemporary models were the products of the last two centuries. The word "extension" in the modern meaning was first used which refers to informal public education in England in the second half of the 19th century (Demiryurik, 2014). This descriptive method of research aid at determining the effectivity of extension services and the productivity of sugarcane farmers in the Visayas, Philippines. The 400 sugarcane farmers randomly identified at the 10 Mill Districts in the Visayas area of the Philippines. An instrument used was the agency Extension Program Guidelines that measures productivity of the farmers, farm profile and extent of services, among others.

The result shows that the level of productivity of sugarcane farms in the Visayas area was high and a significant difference indicates on the level of productivity of sugarcane farms when grouped as to location. The level of productivity of sugarcane farming in the Visayas in terms of indicators such as size of farm, type

European Journal of Agricultural and Rural Education

of soil, land topography, average rainfall received, distance of the farm to the sugar mill, farming innovations, workers' availability and expenses per hectare was at low productivity. Significant difference in the productivity of sugarcane farming in the different Mill Districts in the Visayas area in terms of size of farm, land topography, distance of the farm to the sugar mill, farming innovations, workers' availability, and expenses per hectare except for the type of soil and average rainfall.

The extent of services does not significantly relate to the productivity. Relatively, there is no significant relationship existed between the extent of services and farm profile. Farm profile does not influence the level of productivity, too.

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> [Link](#)

Events

	<p>11th Annual Africa Sugar Conference <i>Informa Connect</i> 7-9 December 2021 Online</p> <p style="text-align: right;">> Link</p>
	<p>7th IAPSIT International Sugar Conference & Sugarcon-2022 <i>"Sustainability of the Sugar and Integrated Industries: Issues & Initiatives"</i> <i>Indian Institute of Sugarcane Research</i> 16-19 February 2022 Lucknow, India</p> <p style="text-align: right;">> Link</p>
	<p>2022 S.I.T. Orlando Conference <i>Sugar Industry Technologists</i> 17-19 April 2022 Orlando, Florida, USA</p> <p style="text-align: right;">> Link</p>
	<p>2022 Australian Society of Sugar Cane Technologists Conference <i>Australian Society of Sugar Cane Technologists</i> 19-22 April 2022 Mackay MECC, Queensland, Australia</p> <p style="text-align: right;">> Link</p>

	<p>The Dubai Sugar Conference <i>Dubai Sugar Conference</i> 13-16 March 2022 InterContinental Dubai Festival City</p> <p style="text-align: right;">> Link</p>
	<p>ASSCT Annual Florida & Louisiana Joint meeting <i>American Society of Sugar Cane Technologists</i> 14-16 June 2022 Hyatt Regency Coconut Point Bonita Springs FL USA</p> <p style="text-align: right;">> Link</p>
	<p>American Sugar Alliance Symposium, Seattle, WA <i>American Sugar Alliance</i> 29 July - 3 August 2022 Seattle, WA, USA</p> <p style="text-align: right;">> Link</p>
	<p>28ª Feira Internacional da Bioenergia <i>Fenasucro & Agrocana</i> 16-19 August 2022 Centro de Eventos Zanini, Sertãozinho, Brazil</p> <p style="text-align: right;">> Link</p>
	<p>Sugar & Ethanol Asia <i>Informa Connect</i> 1 – 3 December 2021 Bangkok, Thailand (and online)</p> <p style="text-align: right;">> Link</p>
	<p>ISSCT XXXI Congress <i>International Society of Sugar Cane Technologists / The Sugar Technologists' Association of India (STAI)</i> February 2023</p> <ul style="list-style-type: none"> • <i>Congress: 20-23 February</i> • <i>Pre-congress tour: 17-18 February</i> • <i>Post-congress tour 24-28 February</i> <p>Hyderabad International Convention Centre (HICC), India</p> <p style="text-align: right;">> Link</p>