November 2022 International Society of Sugar Cane Technologists Founded 1924 Bulletin

Welcome to the ISSCT Bulletin for November 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
- XXXI Congress 3
- Obituary 4

Sugar Cane News 4
- How PepsiCo is working to convince its farmers to embrace regenerative agriculture 4
- Sony to Use Bamboo, Sugarcane Fiber Instead of Plastic for Packaging 4
- Setting science based GHG targets in sugarcane 5
- Bonsucro announces latest impacts 5
- Why Queensland sugar cane can be the 'Exxon of biofuels' [Australia] 5
- Cane farmers on Great Barrier Reef adopt irrigation automation to fix rising groundwater, prevent run off [Australia] 6
- Eleven New Varieties of Sugar Cane to Save the Sugar Industry [Belize] 6
- Maximum Thrust on Decarb Drive: Shell's Blockbuster 3.25B Liter CellEth Deal with Raizen [Brazil] 6
- Wageningen University & Research: Challenges For The Sugarcane Sector In India 7
- Sugarcane production in India shifting from South to North: NSO report [India] 7
- First woman director Dr G Hemaprabha takes charge at ICAR-Sugarcane Breeding Institute [India] 8
- New cane variety identified [India] 8
- Indonesia Efforts To Create Sustainable Agriculture Ecosystem Through Makmur Program [Indonesia] 8
- Indonesia Eyes Sugarcane-Mixed Biofuel to Cut Emissions [Indonesia] 9
- Tires made with tomato, sugar cane hit the road as manufacturers eye environment [Japan] 9
- Silicon is used in construction, microchips and more – 'green' methods could help extract it from sugarcane waste [South Africa] 10
- Sugarcane Ethanol's Ongoing Benefit to California [USA] 10
- U.S. Sugar: Ninety Years of Sustainable, Innovative Agriculture [USA] 10

Latest Research 11

Omics Approaches for Sugarcane Crop Improvement....11

Energy recovery from sugarcane bagasse under varying microwave-assisted pyrolysis conditions....11

Sugarcane Ratoon Yield and Soil Phosphorus Availability in Response to Enhanced Efficiency Phosphate Fertilizer....12

Current floods in Pakistan are expected to have continuing adverse effects on food security beyond the current year: a remote sensing perspective....13

Events....15

31st ISO International Seminar 2022....15

Sugar & Ethanol India Conference – 2023....16

ISSCT XXXI Congress....16

SIT Annual Technical Meeting....16

16th ISO DATAGRO NY Sugar & Ethanol Conference 2023....16

ISSCT News

XXXI Congress

The preparations for the ISSCT XXXI Congress are well underway and registration for the Congress as well as for the Pre, Post Congress Tours and associated activities is proceeding at a reasonable rate. Updated information is available in Congress Newsletter 2 which has just been issued and which accessible through the following link: https://issct.org/wp-content/uploads/2022/11/ISSCT Congress Newsletter 2.pdf

It includes the Programmes for the Congress as well as the Pre and Post Congress Tours, highlights on the sugarcane industry, the congress venue at Hyderabad, Hotel accommodation, Partners' Programme, Trade Exhibition, Entry Visa Application, etc.

In view of facilitating your participation ISSCT and Congress Organising Committee have decided to maintain the Early Bird Registration fee of USD 1100 until 15 January 2023.

Some 200 presentations will be made at Congress and the full programme will be circulated in mid-December.

Concerning entry visa into India: it is recommended that application be made for a tourist visa. E-Visa is accessible in most countries. For this you will need to produce your air ticket and hotel voucher. Conference visas are also available but the procedure is more complex and if you wish to avail yourself you should contact COC (Mr. Sanjay Awasthi - sanjayawasthi@isgec.co.inwho will provide advice and the documents required.

Further information is available on the Congress Website at https://issctcongressindia2023.in/

Or from the ISSCT Secretariat at issctsecretariat@gmail.com

Please note that to attend the Congress you must be a compliant member of ISSCT. The Individual Membership dues are USD 140 and may be settled through the following link: http://members.issct.org/appform/issct_india_2022.aspx

We look forward to your registration and participation at the Congress.

Obituary

It is with great sadness that we have learned about the demise of Michael (Mike) Camm Bennett on 2 October 2022. Mike had a long and distinguished career in the sugarcane industry. He was an Honorary Life Member of ISSCT. Expressions of sympathy on behalf of the ISSCT have been sent to his wife and his four children and their families.

His obituary may be accessed through the following link:

https://issct.org/2022/11/20/in-memoriam-michael-camm-bennett/

Sugar Cane News

How PepsiCo is working to convince its farmers to embrace regenerative agriculture

FOODDIVE	**Food Dive**	**October 26, 2022**	**https://www.fooddive.com/news/pepsico-regenerative-agriculture-farming-sustainability/634993/**

PepsiCo knows it will be a challenge to lower its carbon footprint, with some of its metrics currently headed in the wrong direction. Last year, the CPG giant reported that scope 3 emissions from its supply chain rose 5%, but the company is betting regenerative agriculture can help it reach its goal of achieving net zero emissions by 2040.

As part of its Pep+ sustainability platform launched in 2021, the CPG has committed to spreading regenerative agriculture practices across its key ingredient footprint, equal to 7 million acres. It estimates this will cut at least 3 million tons of greenhouse gas emissions by the end of this decade.

The CPG giant is making a point to stress the economic benefits of regenerative agriculture to its suppliers. Savings from reducing the use of synthetic fertilizers, herbicides and insecticides can help drive profit, it said in its "Positive Ag Supplier Playbook" published in May. The company pointed to Mexico's sugar cane industry seeing yields increase after embracing a regenerative approach.

Sony to Use Bamboo, Sugarcane Fiber Instead of Plastic for Packaging

PC	**PC Magazine**	**November 8, 2022**	**https://uk.pcmag.com/news/143727/sony-to-use-bamboo-sugarcane-fiber-instead-of-plastic-for-packaging**

Sony will start to replace plastic as a packaging material for its products starting in 2023.

As Nikkei reports, the Japanese electronics manufacturer is set to gradually move away from plastic packaging, starting with products that weigh less than 1kg (2.2lbs). These smaller products

make up around 40% of Sony's entire product line-up, and include earbuds, smartphones, cameras, and a huge range of accessories.

As a replacement for plastic, Sony will rely on paper boxes, but is also set to develop its own alternative to plastic as a packaging material. It's thought bamboo and sugarcane fiber will be used as a raw material for this new type of sustainable packaging.

Setting science based GHG targets in sugarcane

Bonsucro | **October 19, 2022** | **https://bonsucro.com/setting-science-based-ghg-targets-in-sugarcane/**

We have launched a project to develop science-based targets and tools that will help companies in the sugarcane sector to reduce their greenhouse gas emissions in line with science to create a stable climate.

To avoid catastrophic impacts from climate change, global warming needs to be kept below 1.5°C. Bonsucro is working with sustainability consultant, Quantis, to develop a GHG mitigation pathway for sugarcane.

Bonsucro has over 290 members in more than 50 countries across the whole sugarcane supply chain and will use its convening role to lead the way to a net-zero, climate-resilient future.

Bonsucro announces latest impacts

Bonsucro | **October 17, 2022** | **https://bonsucro.com/bonsucro-announces-latest-impacts/**

Our latest Outcome Report demonstrates that Bonsucro is growing at a steady pace. Analysis of certification data from the 2020-21 sugarcane harvests indicates that Bonsucro certification continues to lead to more environmentally friendly production practices, and safer working conditions.

Highlights from this year's report show that:

- *Certified producers reduce their CO2 equivalent emissions by an average of 18% over five years*
- *71% of certified mills produce enough electricity from burning bagasse to export a portion to their national grid*
- *32% of certified mills were able to report zero time lost due to accidents, up from 25% in the previous year*
- *Proper personal protective equipment was provided to more than 110,000 farm workers*
- *Water consumption reduced by 53% on average after five years of certification*

Why Queensland sugar cane can be the 'Exxon of biofuels' [Australia]

Financial Review | **November 1, 2022** | **https://www.afr.com/companies/energy/why-australian-sugar-cane-could-be-the-jet-fuel-of-the-future-20221031-p5buag**

In the battle to supply the carbon-neutral aviation fuel of the future, American entrepreneur Karl Seck reckons Queensland's sugar cane industry has one big advantage over the vast cornfields of North America.

	"The one really good thing about bagasse [sugar cane waste] is it is already aggregated," he told the Tech Zero podcast when discussing the potential to turn crops into fuels. *"There's a lot of other feedstocks that are perfectly acceptable feedstocks, just from a science of conversion [perspective]. [But] If you are going out and gathering up yard waste as a feedstock, there's a lot of gathering costs.*

Cane farmers on Great Barrier Reef adopt irrigation automation to fix rising groundwater, prevent run off [Australia]

	ABC News	**November 9, 2022**	**https://www.abc.net.au/news/rural/2022-11-09/cane-irrigation-automation-rising-groundwater-prevent-run-off/101590980**
	For technology enthusiasts, automation is the future, but Queensland cane farmers hope automation will solve a problem from the past and, in turn, protect the Great Barrier Reef. *While not quite as convenient as saying, "Alexa, water my crops," growers hope automating their irrigation can arrest decades of rising groundwater and salinity issues, use less water and prevent runoff.* *Steve Pilla farms at Giru, south of Townsville, where a combination of high cane prices, expensive electricity and the worker shortage has made automation a necessity. Mr Pilla's 150-hectare farm sits in the Burdekin, Australia's largest sugar-growing region. Here, thanks to good access to groundwater, cane has been grown right alongside the Great Barrier Reef since 1875.*		

Eleven New Varieties of Sugar Cane to Save the Sugar Industry [Belize]

	Channel 5 Belize	**October 18, 2022**	**https://edition.channel5belize.com/archives/242408**
	The world continues to grapple with the effects of climate change. In Belize, the sugar industry is facing a climate crisis. The industry has already recorded losses in the millions of dollars, extended droughts and prolonged rains linked to global warming. *The Belize Sugar Industries is seeking to secure the future of the sector from further devastation with the introduction of eleven new varieties of sugar cane. According to B.S.I., four sugar cane farmers associations participated in the research process that led to the development of these eleven varieties. The goal now is to have all even varieties in pre-production across the industry, before scaling up to mass production.* *News Five's Paul Lopez was in Guinea Grass Village today for the launch ceremony. He filed the following report. adoption into the existing ethanol + bioelectric cane industry in Brazil and other world markets.*		

Maximum Thrust on Decarb Drive: Shell's Blockbuster 3.25B Liter CellEth Deal with Raizen [Brazil]

	Advanced Biofuels USA	**November 8,**	**https://advancedbiofuelsusa.info/maximum**

		2022	**-thrust-on-decarb-drive-shells-blockbuster-3-25b-liter-celleth-deal-with-raizen/**
	News arrived from Brazil to begin the week that Shell has agreed to buy a total of 3.25 billion litres of sugar-cane cellulosic ethanol under a long-term agreement with Brazil's Raízen. The low-carbon fuel is expected to be produced by five plants that Raízen plans to build in Brazil, bringing its total portfolio of cellulosic ethanol facilities to nine. *Under the agreement, Shell Trading Rotterdam will buy the cellulosic ethanol produced during the first 10 years of each new facility's operational life. Raízen will supply cellulosic ethanol with a carbon intensity that is approximately 75% lower than gasoline. The last of the plants is expected to begin production by the end of 2027, meaning Shell would continue to receive sugar cane cellulosic ethanol from that plant until 2037.*		

Wageningen University & Research: Challenges For The Sugarcane Sector In India

	India Education Diary	**November 8, 2022**	**https://indiaeducationdiary.in/wageningen-university-research-challenges-for-the-sugarcane-sector-in-india/**
	The sugar sector plays a crucial role for India's economy, but faces challenges in terms of stagnating production, price regulations, unstable sugarcane market and water scarcity. A recent report by Wageningen University & Research shows how a program implemented by Solidaridad India has contributed to adoption of good agricultural practices, including the use of improved irrigation practices, as well as improvements in productivity. *The aim of the programme was to enhance both sustainability of sugarcane growing and to raise smallholder incomes. The Sustainable Water Fund (FDW) provided funding to implement the program by the Dutch Ministry of Foreign Affairs and managed by the Netherlands Enterprise Agency.*		

Sugarcane production in India shifting from South to North: NSO report [India]

	Business Standard	**October 21, 2022**	**https://www.business-standard.com/article/economy-policy/sugarcane-production-in-india-shifting-from-south-to-north-nso-report-122101901271_1.html**
	Six sugarcane-producing northern Indian states saw a 42 per cent increase in their output value between 2011 and 2020 while that of five states from the south declined 32.4 per cent during the same period, according to the latest National Statistical Office (NSO) report. *The report, consisting of data on output value from agriculture, forestry, and fishing shows the cumulative production value of sugarcane in Bihar, Haryana, Punjab, Madhya Pradesh, Uttar Pradesh, and Uttarakhand increased from Rs 30,216 crore to Rs 42,920 crore in real terms over the decade.*		

First woman director Dr G Hemaprabha takes charge at ICAR-Sugarcane Breeding Institute [India]

	The Economic Times	**October 28, 2022**	**https://economictimes.indiatimes.com/news/india/first-woman-director-dr-g-hemaprabha-takes-charge-at-icar-sugarcane-breeding-institute/articleshow/95150733.cms**

ICAR-Sugarcane Breeding Institute has got its first-ever woman director in over a century of the institution's existence.

Dr G Hemaprabha was appointed Director of the institute up to 2024 on the recommendations of the Agricultural Scientists Recruitment Board, New Delhi, under the Union Minister of Agriculture and Farmers' Welfare, an official release said on Friday.

The senior researcher has assumed charge of the director's post, it said.

New cane variety identified [India]

	The Tribune	**October 18, 2022**	**https://www.tribuneindia.com/news/haryana/new-cane-variety-identified-442603**

A new variety of sugarcane, Co-16030, also known as Karan-16, has been identified in the 34th meeting of the All India Co-ordinated Research Project (AICRP) on sugarcane at the ICAR-Indian Institute of Sugarcane Research, Lucknow, three days back. The variety has been developed by scientists of ICAR-Sugarcane Breeding Institute, Regional Centre, Karnal.

As per the scientists, trials of this mid-late group variety were conducted at nine different locations of the North West Zone of the country from 2019-20 to 2021-22. After observing success, it was identified. They claimed that it would be released soon and will be available for farmers.

Indonesia Efforts To Create Sustainable Agriculture Ecosystem Through Makmur Program [Indonesia]

	Cision	**November 1, 2022**	**https://www.prnewswire.co.uk/news-releases/indonesia-efforts-to-create-sustainable-agriculture-ecosystem-through-makmur-program-301664262.html**

The Minister of State Owned Enterprises (SOE) of the Republic of Indonesia, Erick Thohir, initiated the Makmur Program since 2021 to help farmers to increase their income and productivity in Indonesia through comprehensive and sustainable technical assistance and agriculture cultivation.

	Makmur is an agriculture ecosystem which connects farmers and agriculture stakeholders from upstream to downstream which aligns with the G20 agenda, specifically continuation of economic growth from the impact of the Covid-19 pandemic. *The ecosystem is a collaboration of state-owned companies in the Food and Fertilizers, Plantation and Forestry, Financial Services, and Insurance clusters. The Minister of SOEs supported Makmur by establishing a Project Management Office (PMO) led by Indonesia Food Holding Company (ID FOOD).* *In addition to establish this ecosystem, Minister Thohir explained that Makmur also provides on-farm and off-farm technical assistance. On farm control consists of agro inputs such as fertilizers, seeds, pesticides. There is also support for soil analysis, fertilizer recommendations, agronomic and cultivation assistance, to the application of agricultural technology.*

Indonesia Eyes Sugarcane-Mixed Biofuel to Cut Emissions [Indonesia]

Bloomberg UK	**Bloomberg**	**October 18, 2022**	**https://www.bloomberg.com/news/articles/2022-10-18/indonesia-eyes-sugarcane-mixed-biofuel-to-cut-emission-imports?leadSource=uverify%20wall** [Paywall]
	Indonesia plans to sell biofuels made from a blend of sugarcane extract and oil from next year as the world's largest exporter of dirty coal seeks to reduce emission and curb fuel imports. *State-owned oil and gas firm PT Pertamina Persero will begin selling A20 fuel, which is a mix of 80% gasoline, 15% methanol derived from natural gas and 5% ethanol derived from sugarcanes, Chief Executive Officer Nicke Widyawati said in an interview. It plans to source the bioethanol from state plantation holding firm PT Perkebunan Nusantara III.*		

Tires made with tomato, sugar cane hit the road as manufacturers eye environment [Japan]

	Asia News Network	**November 4, 2022**	**https://asianews.network/tires-made-with-tomato-sugar-cane-hit-the-road-as-manufacturers-eye-environment/**
	Leading tiremakers are accelerating their development of tires made with plant materials. *Manufacturers are reviewing not only the environmental performance of their automobiles while on the road, but also the raw materials, parts and components used to produce vehicles. Producing environmentally friendly tires is likely to give automakers an edge in the market.* *The Yokohama Rubber Co. has developed a technology for producing butadiene from plants such as sugar cane and used it to make prototype tires. In June, its racing team drove a vehicle equipped with these tires in the U.S. Hill Climb Race, in which automobiles compete on mountain roads, and completed the whole distance. The company has set a target of producing the new product on a commercial basis in 2034.*		

Silicon is used in construction, microchips and more – 'green' methods could help extract it from sugarcane waste [South Africa]

	The Conversation	**October 18, 2022**	**https://theconversation.com/silicon-is-used-in-construction-microchips-and-more-green-methods-could-help-extract-it-from-sugarcane-waste-192098**

In some parts of South Africa's Mpumalanga and KwaZulu-Natal provinces, sugarcane fields stretch as far as the eye can see. The crop is more than just a treat for those with a sweet tooth: in 2017 the country's sugar industry had an estimated value of more than R12 billion; of this, sugarcane production alone was worth R5.1 billion.

But the sugar industry is shrinking, at least partly because many people are eating less sugar, for health reasons. How, then, might sugarcane production continue to extract value? We believe the answer lies with the crop's waste material.

Our recent work took a 'green' approach to the extraction process. First, we confirmed what a growing body of research has shown: that sugarcane bagasse ash is a natural resource of silica which should be harnessed for industrial purposes. And, using organic acids and bases, we showed what processes might be used for a more environmentally friendly extraction procedure.

Sugarcane Ethanol's Ongoing Benefit to California [USA]

	Ethanol Producer Magazine	**November 7, 2022**	**https://ethanolproducer.com/articles/19721/sugarcane-ethanolundefineds-ongoing-benefit-to-california**

The California Air Resources Board (CARB) is undergoing its regular review to ensure the state is deploying the most cost-effective and technologically-advanced ways to achieve its aggressive climate goals. The "Scoping Plan" is updated every five years and it is an opportunity to assess what is working, and what's not, in the fight to reduce greenhouse gases.

One thing we know is working is the Low Carbon Fuel Standard. Since its inception, the LCFS has driven down the carbon intensity of the fuels used to power California's cars and trucks. This is a policy success other states—and countries—can and should emulate.

U.S. Sugar: Ninety Years of Sustainable, Innovative Agriculture [USA]

	SAP News Center	**September 26, 2022**	**https://barbados.loopnews.com/content/two-major-investments-mount-gay-sugar-mill-and-new-bond**

The sweet tooth has been around since the dawn of humanity, but sugar only became a household staple in the 1880s. Since then, it has swiftly become an important commodity and plays a significant role in the human diet around the world.

Delivering sugar to the table has its own challenges. One company that has been hitting the mark decade after decade is U.S. Sugar, a family business located in the center of Florida. One of the largest agricultural operations in the state, the company owns 230,000 acres of land where sugarcane farming and refining operations run 24/7.

U.S. Sugar is operating in a volatile market. The company supplies about 10% of the 8.4 million metric tons of sugar produced in the United States annually – a commodity whose price can vary

	depending on weather conditions, agricultural supply cycles, government policies, and currency rates. *Today, all commodity businesses are facing numerous challenges, from climate change and carbon emissions to COVID-19 lockdowns, along with operational risks in their supply chains. That's why digitalizing, automating, and increasing efficiencies across the business are crucial to their success. Soft commodities like sugar, meaning that it is grown rather than mined, face additional challenges that are specific to agricultural businesses. Climate is one of them.*

Latest Research

Omics Approaches for Sugarcane Crop Improvement

In this book, the information encompasses various researchable biotechnology aspects of sugarcane, its genomic structure, diversity, comparative and structural genomics, data mining, etc. This book explores both the theoretical and practical aspects of sugarcane crops, focusing on innovative processes. This book argues in favor of developing an integrated research and development system to strengthen the research and development capabilities of all the areas of sugarcane. Further, it covers the recent trends of sugarcane biotechnology, especially in the next-generation sequencing (NGS) era. This book will be very useful for professors and scientists who are working in the area of sugarcane crops by using molecular biology and bioinformatics. It is also useful for students to use as a reference for their classes or thesis projects.

To be published December 30, 2022

> Link



Energy recovery from sugarcane bagasse under varying microwave-assisted pyrolysis conditions

Waste management and utilization of waste is a major global issue. This study investigated the influential parameters on the energy recovery from the sugarcane bagasse breakdown under microwave pyrolysis conditions. The byproduct yield is optimised from 45 different combinations of microwave power, reaction time and microwave susceptor. The surface methodology, energy efficiency and byproduct quality were studied. Low power, less microwave susceptor and longer residence time are the desirable conditions for high biochar yield due to the gradual thermal decomposition of the biomass and low heating rates. The highest bio-oil yield was obtained from higher microwave power and lower residence time. The excess pyrolysis temperature generated by the higher microwave power and higher microwave susceptor addition produces higher temperatures beyond the optimal condition for bio-oil production. This phenomenon is relative to the self-gasification of the biochar during the high pyrolysis power, contributing to the formation of H2, CO and CH4.

Published: November 12, 2022

> Link



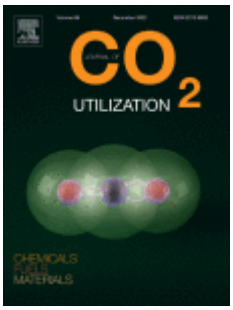
Sugarcane Ratoon Yield and Soil Phosphorus Availability in Response to Enhanced Efficiency Phosphate Fertilizer

The low availability of phosphorus in most Brazilian soils causes a heavy dependence of agricultural production on phosphate fertilizers, which are generally agronomically inefficient in tropical soils. Breeding for increased longevity of sugarcane ratoons is extremely important, but understanding how the efficiency of phosphate fertilization can be improved is equally necessary. The objective of this research was to evaluate the effects of phosphate fertilizers with and without polymer coating on the productivity and nutritional status of sugarcane ratoons and phosphorus availability in the soil. The experiment was carried out on a commercial sugarcane field on a dystrophic Ultisol over two growing seasons in a randomized complete block design with four replications. Two phosphorus sources (monoammonium phosphate (MAP) and MAP + Policote) were tested at four rates (20, 40, 60 and 80 kg P2O5 ha-1) in addition to the control (no P fertilization). The Policote-coated phosphate fertilizer induced higher stalk and TRS yields in the first experimental year, while the same effect was not observed in the second year. Nevertheless, with the reapplication of the treatments in the second study year, the mean stalk yield was high in response to the application of 20 kg P2O5 ha-1 of coated fertilizer and very different from that of the higher rates of the same fertilizer, which yielded 88 Mg ha-1, i.e., 8 Mg ha-1 more than the mean of the other rates.

Published November 11, 2022

> Link

Modeling and environmental implications of methanol production from biogenic CO2 in the sugarcane industry



This article presents a comprehensive model for the industrial production of methanol through the direct hydrogenation of biogenic CO2 from a biorefinery. Carbon capture and transformation to methanol are modeled through process simulation, ensuring that the H2 used for CO2 reduction, as well as electrical power requirements, are renewable. The environmental assessment is performed via a cradle-to-gate life cycle assessment study. The approach is applied to a typical large-scale sugar-ethanol complex in Argentina. The results show that the production of green methanol is a good option for the decarbonization of the industry and the methanol market. The sustainability of the overall process largely depends on the sustainability of the agricultural tasks that form the basis of the biorefinery. This is an unavoidable aspect that is not taken into account in many environmental studies on the production of CO2-based products, which leave aside the origin of the CO2.

Journal to be published January 2023, article available now

> Link

Current floods in Pakistan are expected to have continuing adverse effects on food security beyond the current year: a remote sensing perspective

Since June 2022, many countries from Africa to Asia and Australia to Europe are affected by flash floods. Climate change induced floods in Pakistan have affected about 33 million people requiring assistance amounting to USD $160.3. The situation is further exacerbated by the imminent food insecurity crisis. We show through the analysis of satellite images that in total 78% (3.9 Mha) of the culturable land is affected. Major crops in the current wet season of Sindh province have been inundated including rice (98% flooded), followed by the cotton and sugarcane areas (81% and 71% flooded respectively). Further, about 86% of wheat growing areas will not be available for cultivation in this winter season. Information extracted from the satellite imagery can be used by policymakers to direct resources to assist in the recovery and rehabilitation of agricultural systems destroyed by the floods.

Journal published November 9, 2022

> Link

A high-throughput method for precise phenotyping sugarcane stalk mechanical strength using nearinfrared spectroscopy

Background: Sugarcane (Saccharum officinarum L.) is the core crop for sugar and bioethanol production over the world. A major problem in sugarcane production is stalk lodging due to weak mechanical strength. Since there are no efficient methods for determining stalk mechanical strength in sugarcane, genetic approaches for improving stalk lodging resistance are largely limited. This study was designed to use near-infrared spectroscopy (NIRS) calibration assay to accurately assess mechanical strength on a high-throughput basis for the first time. Results: Hundreds of sugarcane germplasms were harvested at the mature stage in the year of 2019 and 2020. In terms of determining rind penetrometer resistance (RPR) and breaking force, large variations of mechanical strength were found in the sugarcane stalk internodes, based on well-established laboratory measurements. Through partial least square regression analysis, two online NIRS models were established with a high coefficient of determination (R 2) and the ratio of prediction to deviation (RPD) values during calibration, internal cross-validation, and external validation. Remarkably, the equation for RPR exhibited R 2 and RPD values as high as 1.00 and 17.7, as well as showing relatively low root mean square error values at 0.44 N mm-2 during global modeling, demonstrating excellent predictive performance. Conclusions: This study delivered a successful attempt for rapid and precise prediction of mechanical strength in sugarcane stalk by NIRS assay. By using these established models, genetic improvements could be made to phenotyping jobs for large-scale sugarcane germplasm.

Published: November 9, 2022

> Link

Integrating carbon footprint to spatialized modeling: The mitigation potential of sugarcane ethanol production in the Brazilian Center-South



Biomass cultivation has a large influence over the resulting bio-based products and is largely influenced by local conditions. Therefore, accounting for spatialization into sustainability assessments under the life-cycle perspective is key. The study aims to integrate satellite image classification for sugarcane areas in the Center-South of Brazil with georeferenced modeling for sugarcane yield and ethanol production. 290 ethanol mills were simulated, and the resulting inventories were used to trace ethanol's carbon footprint spatial profile and mitigation potential for gasoline substitution. Ethanol's carbon intensity varied from 14.38 to 34.0 gCO2e.MJ-1, with an average of 18.41 gCO2e.MJ-1. By translating these indicators into Decarbonization Credits (CBIOS), under the RenovaBio program, a GHG mitigation potential of 45.07 MtCO2e could be annually attributed to the current Brazilian ethanol sector, corresponding to an additional revenue of US$ 0.88 billion. The proposed georeferenced framework showed significant spatial variations that should be accounted in future sustainability assessments.

Journal to be published February 2023, article available now

> Link

Extraction of sugarcane planting area based on similarity of NDVI time series

IEEE Access
Multidisciplinary | Rapid Review | Open Access Journal

Timely and accurate estimation of the sugarcane planting area is of vital importance to the country's agricultural production and sugar development. In remote sensing crop mapping based on spectral similarity, there will be have a phenomenon of foreign matters with the same spectrum by obtaining an accurate crop reference curve for crop identification, limiting mapping accuracy. In this study, we improved the spectral reconstruction method based on singular value decomposition (SR-SVD). A decision tree model was established based on the similarity of the sugarcane Normalized Difference Vegetation Index (NDVI) time series curve and the fluctuation range of NDVI in different growth periods. Using the Sentinel-2 (Level-2A) image data set to extract sugarcane planting area in two regions of Chongzuo City, Guangxi, China, the overall accuracy was higher than 96%, respectively. The results show that through the spectral similarity and the determination of the threshold fluctuation range, not only high-precision mapping of sugarcane can be achieved, but the problem of "same spectrum with different objects" can also be solved. Therefore, this method can provide accurate information on the sugarcane planting areas and technical support for monitoring the structure of sugarcane planting in the region.

Published: November 4, 2022

> Link

Evaluating the effect of sugarcane planting methods on growth and radiation use efficiency of its different varieties

Acta Académica

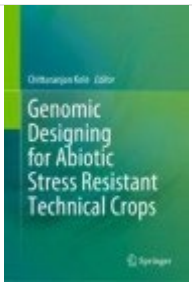
To examine the growth and radiation use efficiency (RUE) of different sugarcane cultivars (HSF 240, CP 77-400 & CPF 249) under two planting methods (2.5 feet apart single row, a farmers' practice, and 4 feet apart dual rows deep trench plantings, a recommended practice) at Research Farm of Sugarcane Research Institute (SRI), Ayub Agricultural Research Institute (AARI), Faisalabad during 2019-20. The

experiment was carried out in randomized complete block design with split-plot arrangement in three repeats. The results showed maximum dry matter (3348.24 g m-2), CGR (21.49 g m-2 day-1), mean CGR (12.78 g m-2 day-1), LAI (7.81), leaf area duration (1290.32 days), along with radiation use efficiency for total dry matter (2.16 g MJ-1) and cane yield (6.32 g MJ-1) in 4 feet apart dual rows trench planting in comparison to 2.5 feet apart single row trench planting, 2.08 g MJ-1 and 5.70 g MJ-1 , respectively. On the other hand, higher dry matter (3451.42 g m-2), CGR (21.54 g m-2 day-1), mean CGR (13.16 g m-2 day-1), LAI (8.01), LAD (1324.58 days), RUE for dry matter production (2.20 g MJ-1) and cane yield (6.53 g MJ-1) was recorded in variety CP 77-400, a direct introduction to SRI, as compared with local material, HSF 240 and CPF 249 and occupying large area in whole Punjab-Pakistan.

Published: September 2022

> **Link**

Genomic Designing for Abiotic Stress Resistant Sugarcane



Abiotic stress in crops is a relevant and persistent problem in global agriculture scenario. Crop production technologies of the past may not hold good for the future with the climate change challenge looming in the horizon and is happening right away as we read this chapter. Several crops, traditional seeds and knowledge are lost in the battle with nature yet, the ever resilient human spirit brings in new set of tools with the help of scientific interventions to feed the increasing demand from the global population. It is heartening to see that for every challenge we face, there is a bigger network of solutions from different parts of the world. We have learnt and continue to alter our agricultural practices, food habits, and energy consumption and apply sustainable efforts for saving the soil, water and other natural resources. However, there is always little we can do when it comes to nature. With this background, the abiotic stress and its effect on an important commercial, industrial and food crop, sugarcane is discussed in this chapter. Although the modern cultivars are hybrids derived from progenitor species, efforts are underway in broadening the genetic base of sugarcane with different traits obtained from a wide germplasm pool, that includes other genera as well, to meet the current demands like drought tolerance, increased biomass for industrial and pharmacological applications, biofuel and energy related applications and finally as a sugar crop of the tropics. Various abiotic stresses and their effect on the sugarcane growth and development, the status, progress and futuristic aspects of tackling them to design a better sugarcane crop with genomics tool are discussed.

Published: November 1, 2022

> **Link**

Events

ISO

31st ISO International Seminar 2022

International Sugar Organization

22-23 November 2022

East Wintergarden, Canary Wharf, London, UK

> **Link**

	Sugar & Ethanol India Conference – 2023 *ChiniMandi Sugar Events* **7-8 January 2023** **Hotel Pullman, Aerocity, New Delhi, India** > **Link**
	ISSCT XXXI Congress *International Society of Sugar Cane Technologists / The Sugar Technologists' Association of India (STAI)* **February 2023** • ***Congress: 20-23 February*** • ***Pre-congress tour: 17-18 February*** • ***Post-congress tour 24-28 February*** **Hyderabad International Convention Centre (HICC), India** > **Link**
	SIT Annual Technical Meeting *Sugar Industry Technologists* **7-11 May 2023** **Louisiana Sugar Refining, New Orleans, USA** > **Link**
	16th ISO DATAGRO NY Sugar & Ethanol Conference 2023 *ISO DATAGRO* **7-11 May 2023** **583 Park Avenue - New York - USA** > **Link**