December 2025 International Society of Sugar Cane Technologists Founded 1924 Bulletin

Welcome to the ISSCT Bulletin for December 2025, in which we collect latest ISSCT updates, along with news, research, and past and upcoming events related to sugar cane technology.

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ISSCT News

End of Year message from Chair and General Secretary

Dear Members of ISSCT,

As 2025 draws to a close, it is appropriate to reflect on this historic and inspiring year — one that marked the Centennial of the International Society of Sugar Cane Technologists.

The celebrations held in Cali, Colombia, were not only a commemoration of our 100 years of collective achievement, but also a renewed demonstration of our shared commitment, collaboration and engagement to scientific and technological excellence and innovation, across the various disciplines of the five Commissions, bringing together professionals from all continents. The success of the XXXII Congress may be gauged by the high level of attendance, the second highest in our entire existence. The strong participation in the trade exhibition — which featured over 100 leading brands — also stood out, along with the valuable exchange of experiences during the technical visits. This is further enhanced by its scientific programme, dedication of researchers, technologists and industry professionals as well as the warm hospitality of our Colombian host. This was made possible on account of your support and engagement. We take this opportunity to extend our sincere appreciation to all of you.

This year has also seen the strengthening of the ISSCT foundations. As part of the centennial celebration, a special Volume entitled 'The First 100 Years of the International Society of Sugar Cane Technologists–1924-2024', was published. It comprised the History and Development as well as the Research Advances brought by our members across decades and their Impact. As part of the centennial celebrations, we honored the eminent scientists who, over the decades, laid the foundations of global sugarcane knowledge.

Changes have been brought as the Society enters into its second century of its existence. The notable one is the election of a woman as Chair of Council and Executive Committee.

The Society's financial position remains sound, ensuring the continuity of its services and activities. We are also continuously revisiting our constitution, to

remain relevant in a fast-evolving global context. Communication through our Bulletin, website, and social media has continued to expand and improve, enabling ISSCT to connect our global sugarcane community and share advances across the entire sugarcane value chain.

Above all, 2025 has once again reminded us of the purpose that defines ISSCT. From its beginnings in 1924 to its centennial milestone, the Society has continued to lead through science, innovation, and the enduring passion of its members.

As we look ahead to 2026 and the years beyond, the emerging challenges — from climate change to digital transformation — will require renewed engagement, strategic vision, and collaboration from all of us. We are confident that ISSCT will remain a driving force in shaping a sustainable and forward looking future for the sugarcane industry. We also look forward to the XXXIII Congress in Guatemala in early 2028, where we hope members will be able to witness tangible results and progress in addressing the new challenges facing us.

With deep appreciation, we would like to thank all our members, partners, and institutions for their invaluable contribution throughout this memorable year. We also acknowledge the valuable contributions of the outgoing Chair and members of our Council, Executive Committee, Technical Programme Committee, and the various office bearers for their support and commitment to the Society's mission.

May 2026 bring continued success across our worldwide community.

Monalisa Sampaio Carneiro

Chair Council and Executive Committee

Jean Claude Autrey

General Secretary

Summary of Co-products papers and posters presented at the ISSCT Congress held in August 2025 in Cali Colombia

By Dr. Bryan Peter Lavarack, Farleigh Mill, Mackay, Queensland, Australia



Twenty-three Co-Products papers and six posters were presented at the ISSCT XXXII Centennial Congress in Colombia.

Plenary

The plenary sessions focussed on genetic modification, artificial intelligence and climate change. The plenary paper by Sousa discussed the Brazilian Sugarcane ethanol contribution to the global climate-change mitigation effort. Sousa reported data for a selection of developing countries with large populations that have the potential for high energy demand. The countries represent almost half of the world's population and include Argentina, Brazil, China, Colombia, Ethiopia, Guatemala, India, Indonesia, Malaysia, South Africa and Thailand. These countries could produce an additional 45 GL of biodiesel and 64 GL of ethanol, displacing 300 million t of CO_2-equivalent using around 5% of pastureland.

Research over the last 100 years

A series of four reports, each reflecting about 25 years of research and development, was presented by Lavarack, Fraga, Aita, Avram-Waganoff, Umrit and Del Olmo as part of 1924-2024 centennial volume of the society.

The centennial review of the Co-products Commission showed that R&D may be categorised into three fields: namely ethanol, gasification/pyrolysis/cogeneration and niche value-added products.

Lavarack gave an overview on renewable energy which overlaps all three fields and is not categorised in the sections below.

Ethanol

Papers on the ethanol theme have again featured prominently; accounting for about one third of the co-product papers presented. Barrera reported on value-

added products from Vinasse, Bastidas *et al.* presented on reducing downtime on ethanol columns applying the Radfrac model and Santander *et al.* reviewed microbial diversity with metabarcoding which allowed for the implementation of strategies to control microbial contamination in ethanol fermentation. Saska *et al.* examined the effect of colour on yield and Urayayi *et al.* undertook preliminary work to recovery potassium from vinasse. Shrinivasen *et al.* reported on how ethanol has been a gamechanger for the Indian sugarcane industry. Chandgude *et al.* reported on ethanol blending in diesel engines and its impact on emissions. In similar vein, Ojeda *et al*. investigated carbon emission reduction using bioethanol in turbo-diesel engines showing an average fuel reduction and 12.8% reduction in greenhouse gas emissions. This highly practical project with direct application to sugar millers and growers was awarded the Jean-Maurice Paturau prize for best Co-product paper.

Gasification/pyrolysis/cogeneration

Francke Colombres *et al.* examined the gasification of harvest residues in a theoretical study. In another paper from Argentina, Golato *et al.* reviewed metal oxide catalysts (CaO, MgO, Na_2O, and KH_2PO_4) to boost gasification. Lima and White reported the production of biochar to increase cane yields. Ospina *et al.* continued the research into combustion of sugarcane agricultural residues undertaken and reported at previous congresses.

Niche products

Aita and Moon reviewed the properties of silver nanoparticles derived from bagasse. This research has great promise in medical and non-medical fields. The silver nanoparticle act as antimicrobial substances, catalysts, drug delivery carriers, and cosmetic ingredients, as well as plant growth bio-stimulants, environmental, and remediation agents.

Campo Núñez *et al.* investigated transforming bagasse ash into ceramic bricks. Cavailles *et al.* reported on the extrusion pre-treatment of bagasse to form food containers.

Donneys and Perea developed a roadmap for the production and implementation of green hydrogen in the Colombian sugar industry. Konde *et al.* reviews the potential for green hydrogen production in India. Their techno-

economic study for a 5 tonnes per day green hydrogen production plant using water electrolysis appears viable with a payback period of less than 5 years.

Fraga *et al.* reviewed advances in the conversion of sugarcane bagasse to 5-chloromethylfurfural as a platform chemical. Parrado *et al*. assessed lactic acid production in a Colombia bio-refinery based on laboratory work. Wu-Tiu-Yen and Fargues examined the extraction of aconitic acid from vinasse. They achieved a recovery rate of 61% at 28% dry matter content in their pilot work.

Conclusion

Important R&D work in the field of co-products is reported in the proceedings. Although over 85% of the papers accepted for publication were presented, many were not presented nor discussed. This highlights an ongoing problem of the non-reporting of quality research and of reduced technical interaction at Congress.

An important output noted during Congress and suggestion to be undertaken forward in the next 100 years of ISSCT is to incorporate ESG aspects into the Co-products Commission with potential re-naming of the Commission to reflect future growth of both the Commission and ISSCT.

Bryan Peter Lavarack
ISSCT Co-Products Commissioner 2019-2025

Summary of the papers and posters in the Molecular Biology Section presented at the XXXII ISSCT Congress in Cali, Colombia in August 2025

by Dr. Michael Butterfield, CTC - Centro de Tecnologia Canavieira Piracicaba, Brazil



There were 10 full papers and five posters in Molecular Biology presented at the Congress, as well as a Plenary session dedicated to recent advances and opportunities in the field.

Plenary Session

The session commenced with John Riasco from Colombia describing how a Genomics-assisted breeding platform is being used to compliment tradition breeding for sucrose content, biomass pest resistance and stress tolerance at Cenicaña, by using both marker-assisted selection, as well as genomic selection. This was followed by Mike Butterfield from Brazil, who gave a history of the development of genetically modified (GM) sugarcane, and described the current status of commercial planted GM varieties from CTC in Brazil, as well as the measured benefits in sugar and ethanol recovery, as well as lower color and higher Pol of VHP sugar produced from insect resistant GM varieties. The plenary session concluded with Michael Jones of Murdoch University, Australia who described the new gene editing (GEd) technologies such as zinc finger nucleases, TALENS and CRISPR/Cas and their potential applications to crop improvement. GEd crops offer an opportunity to overcome some of the regulatory and public perception challenges associated with GM crops but requires an alignment and harmonization of global Regulation frameworks to support international trade of GEd products.

100 Years of research in Physiology and Molecular Biology

Presentations in the Molecular Biology section started with a summary of the last 100 years of research presented at ISSCT in the fields of Physiology (1924 to 1992) and Molecular Biology (1992 to 2023) by Michael Butterfield, Asha Dookun-Saumtally and Natalie Piperidis. Notable advances during this period include:

- Development of the "Hawaiian" crossing solution in 1924, still used in Breeding programs today;
- Detailed description of CO2 fixation in sugarcane, which lead to the discovery of the C4 photosynthetic pathway;
- Work on chemical ripeners to increase sucrose content before harvesting;
- First development of molecular markers (firstly isozyme, then RFLPs) to understand sugarcane genomics;
- The first genetically modified sugarcane produced via biolistic transformation, followed by subsequent advancements in genetic engineering;
- Continuing advancement in sugarcane genomics, culminating in the description of the Bru1 gene for brown rust resistance, and the assembly of the genome of the sugarcane cultivar R570.

Full papers presented at the Cali Congress

Following the Centennial presentations, 10 oral papers were given, which can be summarized under three broad topics:

Genome analysis and gene discovery

Angelique D'Hont described the recent advances of the CIRAD group, together with international collaborators in understanding the architecture of the sugarcane genome. A polyploid genome assembly of R570 has been produced, together with whole genome sequencing of 305 accessions representing the Saccharum genus and modern cultivars. A novel approach based on k-mers was developed to identify the species and geographical origin of chromosome segments, which uncovered the existence of ancestral contribution from an unknown S.officinarum subgroup originally present in New Caledonia or the surrounding islands. Muqing Zhang from Guangxi, China reported on QTL mapping to identify candidate genes involved in plant height and gibberellin metabolism that could be used in targeted breeding for biomass improvement. Using association mapping, Josefina Racedo from Argentina identified SNPs related to alternative sources of brown rust resistance not associated with the Bru1 gene. Finally, John Rascos from Colombia described their work on identifying genes associated with drought tolerance through RNA-seq experiments. Four

candidate genes were identified and have been tested for function in transformed Arabidopsis plants with promising results.

Genetic modification and gene editing

Three papers dealing with different types of genetic engineering and editing were presented. Florence Budeguer from Argentina described how sugarcane lines transformed with the HaHB11 transcription factor gene from sunflower showed enhanced biomass production and improved tolerance to drought and salinity. German Serino, also from Argentina presented on their attempts to use gene editing (homology-directed repair) to produce mutations aimed at obtaining tolerance to ALS herbicides. Although they were successful at achieving HDR editing of some copies of the ALS gene, none of the edited lines showed the expected phenotype, possible due to an insufficient number of edited copies of the endogenous gene. Jershon López-Gerena from Colombia shared their work on developing insect resistant sugarcane and proof of concept experiments on gene editing. Field trials were planted with 867 transgenic events containing the Cry1Ab gene to control Diatraea. Of these lines, only six showed adequate expression of the Cry1Ab protein, and one line showed an efficacy of borer control of 81%.

Techniques and tools

Three papers dealing with techniques and tools in Molecular Biology were also presented. Karen Aitken from Australia described the utility of a 58K SNP array in creating genetic maps. Maps were generated for four parents of two bi-parental crosses, with the number of markers per map varying from 7432 to 9872. The linkage groups were aligned with the Sorghum and Sugarcane (R570) genome assemblies which allowed comparative mapping among the parental maps. Shailesh Joshi from South Africa compared a more traditional method of transgene copy-number estimation (qRT-PCR) with a newer method – chamber-based digital PCR (cdPCR). He showed that cdPCR is faster, more accurate and more reliable than qRT-PCR and proposed changing to the new method in the South African program. For the final technique paper, Rafael Almeida from Brazil described using environmental parameters of vapor pressure deficit (VPD), air temperature, as well as photon flux density (PPFD) measured by an infrared gas analyzer to predict photosynthesis, as measured by CO2 assimilation. The model

developed showed a high predictive capacity and indicated significant reduction in photosynthesis when VPD increased beyond 3 kPa and at temperatures above 35oC. Although this paper was submitted in the Molecular Biology section, for Congress program logistics it was presented in the Agronomy section.

Conclusions

The session of Molecular Biology presentations was well attended, and the papers covered a broad range of relevant topics. It also illustrates that ISSCT remain a relevant forum where scientists can share and discuss preliminary research results, experiments that did not have the desired outcome, and important information that might not otherwise reach publication in commercial scientific journals.

Michael Butterfield
Chair
Molecular Biology Section 2023-2025

Report of the Survey on Members Satisfaction/Expectations

The report on the Survey on Members Satisfaction/Expectations, to which there were 142 respondents, was received from the Consultant in mid-November. It is being considered by ExCo and TPC members, following which a virtual meeting will be held to analyse the contents, the comments, the recommendations and to discuss their implementation. The report will be published in the February issue of the ISSCT Bulletin.

Update XXXIII Congress, Guatemala

Discussions are being pursued with the Congress Organising Committee of the ISSCT XXXIII Congress hosted by Asociación de Técnicos de Azucareros de Guatemala (ATAGUA). The following aspects are under consideration: Venue – two options available, dates, programme for pre-congress and post-congress tours, registration fee, hotel accommodation, social events, etc. It is expected that all these matters will be finalised by January 2026 and will be reported in the February issue of the ISSCT Bulletin and a first Congress Newsletter will be sent to members in early 2026.

Centennial Medals and Plaques for best papers and posters

Medals were further presented to the recipients, namely:

Prof. Paulo Sérgio Machado Botelho, one of the prominent contributors in Entomology for the period 1975-1999 in the Centennial Volume, is a Brazilian researcher and agronomist known for his work in biological control of agricultural pests in Brazil received. He received his centennial medal from Prof. Monalisa Sampaio Carneiro, Chair ISSCT at a reception held on 11 November 2025.



Dr Sandy Snyman (Vice-president SASTA) accompanied by Dr Lawrence Malinga (Senior Entomologist, SASRI) presented the Centennial Medal to Mrs Phoebe Carnegie, widow of Dr Alistair Carnegie, one of the three prominent contributors in Entomology 1975-1999.



The Plaques for best paper and posters were sent by courier to the recipients in early December 2025.



However, the plaque for the best paper, entitled: ***The major contribution of resistance to orange rust and yellow leaf in modern sugarcane hybrids comes from Saccharum spontaneum as evidenced by genome-wide association studies*** of the Biology Commission was handed over to Dr. Jean-Yves Hoarau, the senior author by the General Secretary during a trip to Réunion Island on 13 November 2025.

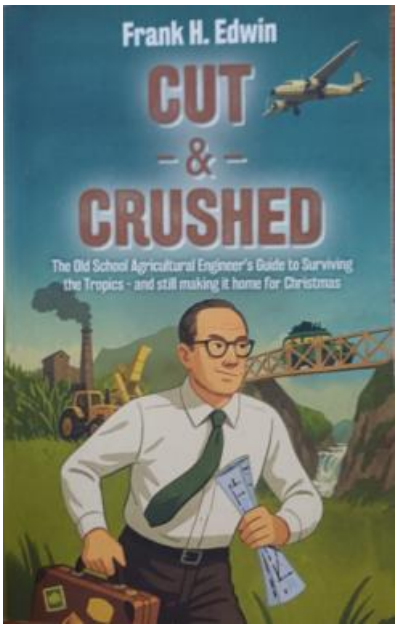


Dr. Jean-Yves Hoarau holding the plaque with two co-authors Thomas Dumont (left) and Jordan Dijoux (right) and the General Secretary

Biographies of Mr. Harold Deacon and Dr. Paul Octave Wiehe

The biographies of two past ISSCT members have recently been published in the UK and in Mauritius.

Cut & Crushed



Harold Deacon (called Frank H. Edwin in the book) began his formal career with the West Indies Sugar Corporation (WISCO) in 1958. Before joining WISCO, he worked as a mechanical design engineer at the Fletchers company in Derby, England, where they designed and constructed specialist cane milling and factory equipment.

WISCO later became Tate & Lyle, and he served as a Director of its technical services subsidiary until his retirement in 1985, when he continued to do voluntary work in the West Indies for a few years.

Deacon was a member of ISSCT throughout the 60s and 70s and played a major role in founding the British Society of Sugar Cane Technologists (BSSCT) in the early 1980s.

He attended his very first ISSCT Congress - the XIII Congress in Taipei, Taiwan in 1968, where he presented a paper on the development of mechanised harvesting in the Caribbean. He later attended other ISSCT events including the XVI Congress, in 1977, in Sao Paolo, Brazil.

Deacon's field and consultancy work took him to many countries, with major projects in Belize, the Philippines, Indonesia, Thailand, Colombia, Swaziland, Trinidad, Zambia and Nigeria, amongst others. His biography, fittingly subtitled "*The Old School Agricultural Engineer's Guide to Surviving the Tropics – and still making it home for Christmas*" offers more than just a history of his work in the sugar industry but describes a collection of often light-hearted stories about his travels and the challenges he sometimes faced. The book, published by HaraldsDottir, is authored by Rachelle de Caan, daughter of Harold Deacon and has the ISBN-978-1-913898-95-3.

Octave Wiehe: *un Mauricien visionnaire* (A visionary Mauritian)

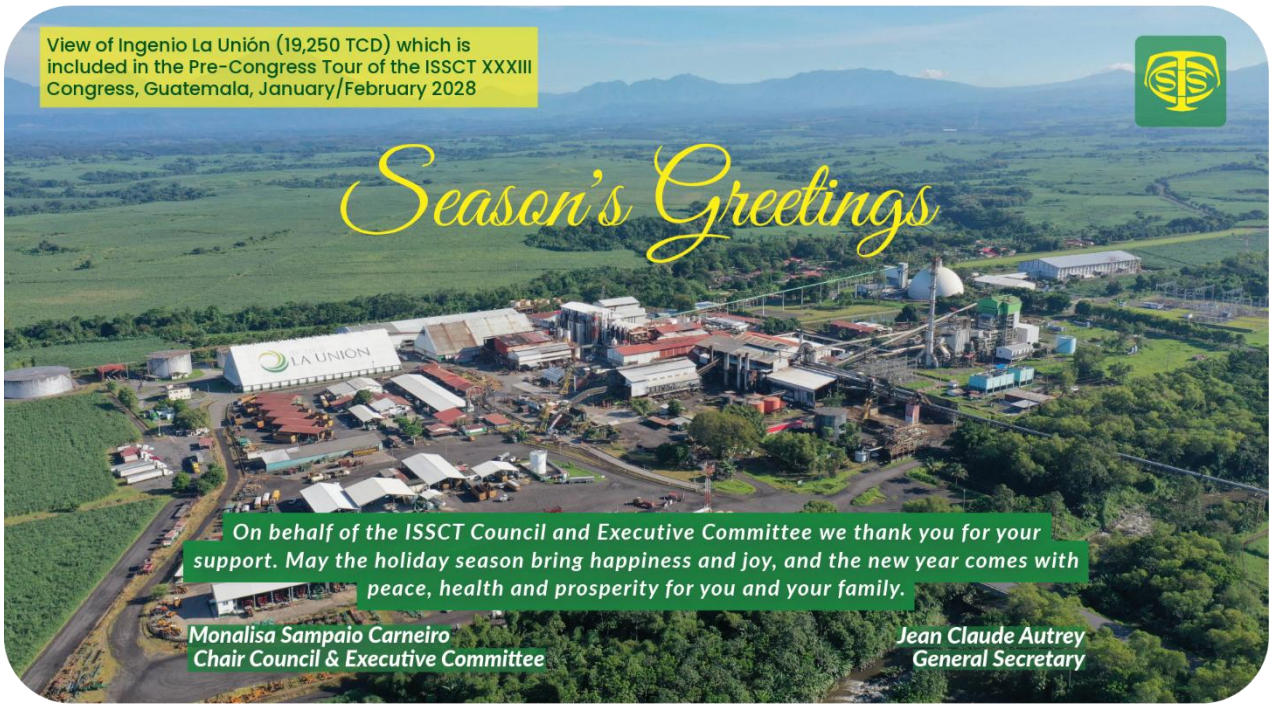


Dr. Paul Octave Wiehe, was a renowned botanist, ecologist and plant pathologist who graduated from the Imperial College of Science and Technology, University of London. He served as the first Director of the Mauritius Sugar Industry Research Institute from 1953 to 1968, transforming it into a world-renowned institute. In 1968 he was appointed the first Mauritian Vice-Chancellor of the University of Mauritius, a position he held until 1973.

Dr. Wiehe was an active member of the ISSCT, and participated in many congresses during the 1950s and 1960s and authored several papers at these congresses. He was the Chair of the XI ISSCT Congress held in Mauritius in 1962 and he was made Honorary Life Member of the Society in 1974.

His biography entitled *Octave Wiehe: un Mauricien visionnaire (a visionary Mauritian)* co-authored by several contributors, including the ISSCT General Secretary who wrote about his distinguished career as Plant Pathologist, Research Director and Academic covering 36 of the 40 years of his professional life. The book is published by Streak Designs with ISBN-978-99993-0-293-7.

Season's Greetings



Sugar Cane News

The origin of sugar cane revealed

	CIRAD	**October 15, 2025**	**https://www.cirad.fr/espace-presse/communiques-de-presse/2025/l-origine-canne-a-sucre-devoilee**

The origin of sugarcane, a major global crop, was previously poorly understood due to the complexity of its polyploid and interspecific genome. A recent study, conducted at CIRAD in collaboration with the Joint Genomic Institute (USA), reveals the evolutionary history of this crop. This discovery opens new perspectives for the development of sugarcane varieties more resistant to stresses (diseases, climate change). The results of this work were published on October 14, 2025, in the journal Cell.

By analyzing genomic diversity, based on sequencing data from 390 representative accessions, using innovative methods—particularly those based on repeated sequence/transposable element content— researchers at CIRAD have traced the domestication, diversification, and modern selection of sugarcane. Their study confirms the scenario in which Saccharum officinarum (sugarcane) was domesticated from the wild species S. robustum approximately 8,000 years ago in New Guinea and the surrounding islands. Furthermore, it reveals that its genome is a mosaic involving different subgroups of S. robustum.

Researchers Develop Hydrophobic Coatings Using Silica Extracted from Sugarcane Bagasse Ash

	Bioengineer.org	**November 21, 2025**	**https://bioengineer.org/eco-friendly-hydrophobic-coatings-from-sugarcane-ash/**

Researchers have developed a method to create hydrophobic coatings using silica extracted from sugarcane bagasse ash, a byproduct of sugar production. The study, conducted by Manivannan J., Mohan N.S., and Arulraj A., explores the potential of utilizing waste materials for sustainable industrial applications. This approach focuses on repurposing sugarcane bagasse ash, which is typically discarded as waste, into an eco-friendly material capable of repelling water.

The research highlights the extraction process of silica from the ash and its subsequent application in producing hydrophobic coatings. Sugarcane bagasse ash contains silica in significant quantities, making it a viable resource for this purpose. The study emphasizes that this method not only reduces waste but also provides an alternative to conventional hydrophobic coating materials, which often rely on non-renewable resources or environmentally harmful substances. By leveraging agricultural waste, the researchers aim to contribute to sustainable practices within industries that require water-resistant surfaces.

Global sustainable farming gets boost as Bonsucro and Better Cotton partner on climate resilience initiative during COP30

BON SUCRO	**Bonsucro**	**November 10, 2025**	**https://bonsucro.com/climate-resilience-platform-announcement/**

Bonsucro, the global leader in promoting sustainable sugarcane, has announced a new partnership with the Alliance of Bioversity International and the International Center for Tropical Agriculture (CIAT) to advance the Climate Resilience Platform (CRP) and extend its utility for sugarcane and cotton producers globally. This collaboration is delivered in close partnership with Better Cotton, as part of Bonsucro's Climate Action Toolkit initiative.

Developed initially by PepsiCo, Foundation for Food & Agriculture Research (FFAR), and the Alliance of Bioversity International and CIAT, the Climate Resilience Platform translates the latest climate science into actionable information for farmers and agri-businesses, helping them anticipate yield risks and implement strategic, targeted interventions. The open-access, digital platform is powered by CGIAR, the world's largest public agricultural research partnership, guaranteeing robust, unbiased insights trusted by over 100 countries.

The AI tech giving Coca-Cola an 'incredible opportunity' to tackle emissions at source

AgTechNavigator	**AgTechNavigator**	**August 20, 2025**	**https://www.agtechnavigator.com/Article/2025/08/20/the-ai-tech-giving-coca-cola-an-incredible-opportunity-to-tackle-emissions-at-source/?utm_source=copyright&utm_medium=OnSite&utm_campaign=copyright**

Earlier this year Coca-Cola Europacific Partners (CCEP) announced a partnership with AI-driven plant breeding start-up Avalo. The project hopes to find sugarcane varieties that offer better yields from lesser quantities of water and fertiliser, explains Nicola Tongue, director – ventures, Coca-Cola Europacific Partners

New India-China partnership to improve sugarcane productivity

THE TIMES OF INDIA	**The Times of India**	**November 19, 2025**	**https://timesofindia.indiatimes.com/city/bareilly/new-india-china-partnership-to-improve-sugarcane-productivity/articleshowprint/125416628.cms**

A delegation led by Ashwini Srivastava, joint secretary (Sugar) in the Union department of food and public distribution, signed a strategic memorandum of understanding (MoU) with China's Sugarcane Research Institute (SRI), Guangxi Academy of Agricultural Sciences, in Nanning on Monday. The agreement was finalised during a four-day bilateral discussion session held in China.

Deepak Ballani, director general of the Indian Sugar Mills Association (ISMA), told TOI that the collaboration marks a major step towards joint research, development, training and technology transfer aimed at improving sugarcane productivity and sustainability in India.
SRA's scientists and technicians advance research and provide essential scientific services to the sugar industry, including Ratoon Stunting Disease (RSD) and disease diagnostics, sugarcane DNA testing, and comprehensive soil, water, and nutrient analysis.

Queensland University of Technology announces $11.8m investment in fermentation facility [Australia]

	The Plant Base	**September 30, 2025**	**https://www.theplantbasemag.com/news/queensland-university-of-technology-announces-18m-investment-in-pilot-scale-fermentation-facility**

Australia's Queensland University of Technology (QUT) has invested AUD 18 million (approx. $11.8 million) into its Mackay-based QUT Pioneer BioPilot, an upgraded, pilot-scale fermentation and biomanufacturing facility.

Supported by funding from the Australian and Queensland governments, and in association with Australia's Food and Beverage Accelerator (FaBA), the QUT Pioneer BioPilot has been transformed into a food-grade fermentation facility in line with the university's ambitions to become an Asia-Pacific biomanufacturing hub.

Progressive Sugar Cane Producers Association Unveils Solar powered Irrigation System [Belize]

	LoveFM	**July 7, 2025**	**https://lovefm.com/progressive-sugar-cane-producers-association-unveils-solar-powered-irrigation-system/**

Yesterday, the Progressive Sugar Cane Producers Association unveiled a solar-powered irrigation system, a first-of-its-kind in the sugar cane industry, along with breaking ground for a biofactory. Love News' Rafael Roberts travelled to San Luis and filed the following story.

Yesterday, members of the Progressive Sugarcane Producers Association gathered in the San Luis area of the Orange Walk District for the inauguration of a small solar-powered irrigation system and the groundbreaking for a biofactory. The solar plant was strategically built to supply electricity for a new irrigation system on a five-acre plot of lawn benefiting 810 farmers.

Sugarcane ensures sustainable electricity during drought: study highlights bagasse's potential for energy security and renewable generation in Brazil

	CPG	**October 21, 2025**	**https://en.clickpetroleoegas.com.br/cana-de-acucar-garante-energia-eletrica-sustentavel-na-seca-estudo-destaca-potencial-do-bagaco-para-seguranca-energetica-e-geracao-renovavel-no-brasil-hl1402/**

On October 21, 2025, Embrapa released an article about a study that reinforces the strategic role of sugar cane in the generation of sustainable electrical energy during periods of drought.

The search, which according to the entity was published in the magazine Renewable Energy, highlights the potential of sugarcane bagasse as a source of bioelectricity, capable of contributing significantly to the energy security of Brazil.

Advancing sustainability in Brazil's biofuels sector: The evolving partnership between Bonsucro and ANP

	Bonsucro	**November 20, 2025**	**https://bonsucro.com/bonsucro-and-anp-evolving-partnership/**

Brazil is recognised globally for leadership in sustainable biofuels. Two initiatives stand out in this landscape: RenovaBio, the national biofuels policy designed to reduce greenhouse gas emissions, and Bonsucro, the leading platform for more sustainable sugarcane. Both systems are widely adopted by sugarcane ethanol producers in Brazil, reflecting a growing demand for low-carbon, traceable and responsible production.

RenovaBio, launched by the Brazilian government in 2017, aims to expand renewable fuel production and reduce greenhouse gas emissions. Through voluntary certification, ethanol-producing mills can demonstrate their energy and environmental efficiency. Certified mills are eligible to issue Decarbonisation Credits (CBIOs), which are traded on the financial market, creating a strong incentive for cleaner practices and additional revenue streams.

Sugarcane giant Atvos and biochar leader NetZero announce pioneering partnership in Brazil

	NetZero	**September 23, 2025**	**https://netzero.green/en/news/press-releases/PR-NetZero-20250923-EN.pdf**

Atvos, one of the largest biofuels producers in Brazil, and NetZero, a leader in the industrial production of biochar, have signed a memorandum of understanding to deploy biochar in Atvos' supply chain. Before year end, pending regulatory approval, the companies plan to start

construction of a biochar factory in Caçu, a municipality of Goiás, the second-largest sugarcane-producing state in Brazil.

The factory, to be built inside Atvos' Rio Claro agroindustrial plant, will produce over 6,500 tonnes of biochar per year using 'Gen2', NetZero's new modular biochar-production system. It will process sugarcane residues — bagasse and leaves – which are today burned or left to decompose. The resulting biochar will be applied back on Atvos' sugarcane fields, allowing for a fully local and circular model.

Fiji eyes 60% mechanical cane harvesting by next year

FBC News | **August 20, 2025** | **https://www.fbcnews.com.fj/news/fiji-eyes-60-mechanical-cane-harvesting-by-next-year/**

The Ministry of Sugar Industry is pushing ahead with plans to modernise farming, aiming to have 60 percent of the country's sugarcane harvested mechanically by next year.

Minister for Sugar Charan Jeath Singh says the government has invested $978,200 this financial year to promote farm mechanisation, which includes fertiliser applicators, boom sprayers, cane planters, and upcoming AI-supported technologies such as drones.

Vasantdada Sugar Institute doubles AI subsidy for cane farmers in Maharashtra [India]

The Times of India | **October 13, 2025** | **https://timesofindia.indiatimes.com/city/pune/vasantdada-sugar-institute-doubles-ai-subsidy-for-5000-cane-farmers-in-maharashtra/articleshow/124510643.cms**

Pune: Deputy chief minister on Sunday announced that the Vasantdada Sugar Institute (VSI) had decided to double the subsidy — from Rs9,250 to Rs18,250 per hectare for the 2025–26 crushing season — for 5,000 farmers who have adopted artificial intelligence (AI) in sugar cane cultivation.

A key member of the governing council of the Pune-based institute, Pawar said the revised subsidy would be given to the first 5,000 farmers across Maharashtra on a first-come-first-served basis.

ICAR actively developing and promoting multiple disease-resistant sugarcane varieties to improve recovery rates [India]

ChiniMandi	**ChiniMandi**	**October 8, 2025**	**https://www.chinimandi.com/icar-actively-developing-and-promoting-multiple-disease-resistant-sugarcane-varieties-to-improve-recovery-rates/**
	Zuari Industries (SPE Division) convened the second edition of its roundtable conference on "Mechanization and Digitalization in Sugarcane – Driving Efficiency, Productivity, and Sustainability" at Gobind Sugar Mill, Aira, Lakhimpur Kheri, Uttar Pradesh. The two-day event, held on October 6 and 7, 2025, brought together farmers, scientists, policymakers, technology providers and leaders from the sugar industry to explore how mechanization and digital tools can transform India's sugarcane sector, according to the press release. *Building on the success of the first roundtable in 2024, which focused on climate-resilient sugarcane, Roundtable 2.0 shifted the spotlight to mechanization and digitalization aimed at enhancing yield, reducing input costs, and improving overall resilience.* .		

Seeds of Change: Laying the groundwork for more inclusive, sustainable sugarcane [India]

Solidaridad	**Solidaridad**	**November 18, 2025**	**https://www.solidaridadnetwork.org/news/seeds-of-change-laying-the-groundwork-for-more-inclusive-sustainable-sugarcane/?utm_source=chatgpt.com**
	The Sustainable and Ethical Engagement in Decent Sugarcane (SEEDS) programme in Maharashtra, India, is designed to create a replicable model of sustainable agricultural development. By improving working conditions and strengthening community wellbeing, the programme aims to ensure that the local sugarcane supply chain is both environmentally responsible and socially equitable. *Since its launch in September 2024, SEEDS– implemented in India by Solidaridad in partnership with The Coca-Cola Company– has focused on improving working conditions and expanding workers' access to government welfare. The programme also supports farm sustainability across three sugarcane sourcing mills in Maharashtra, including one mill of Dalmia Bharat Sugar in Kolhapur and two of Baramati Agro Limited in Pune and Kannad.*		

Drone-listening sensors tackle sugarcane stalk borer in South Africa

UK Agri-Tech Centre	**UK Agri-Tech Centre**	**October 23, 2025**	**https://ukagritechcentre.com/case-study/accelerating-agri-tech-sweet-success/?utm_source=chatgpt.com**
	An innovative pest-monitoring project in KwaZulu-Natal has deployed 118 AgriSound Polly™ bioacoustic sensors across sugarcane fields to detect activity of sugarcane stalk borer. The low-cost devices "listen" for insect flight sounds and combine this with temperature, humidity and light data to give near-real-time risk alerts.		

	The project, which also integrates improved soil-borne disease control and hydroponic seedling production, demonstrates how edge-computing, sensor networks and precision spraying can reduce pesticide use and improve timing of interventions for key cane pests.

Cane to clean: Small-scale farmers in KZN lead SA's greener sugar future [South Africa]

	Mail & Guardian	**October 18, 2025**	**https://mg.co.za/the-green-guardian/2025-10-18-cane-to-clean-small-scale-farmers-in-kzn-lead-sas-greener-sugar-future/**
	For KwaZulu-Natal sugarcane farmer Mazwi Simelane, farming is more than work — it's a calling. "God gives us the land and when you plant a seed in the ground, you must have faith and pray for it to grow," he said. "That's what I enjoy most watching how something small can become a blessing through hard work, interventions and God's grace." *Simelane, who farms with Makhatini Sugarcane, was among small-scale growers and experts, who recently gathered in Jozini for a two-day workshop convened by the United Nations in South Africa, with technical leadership from the UN Industrial Development Organisation (Unido) and support from the Joint SDG Fund.* *There, the South African Farmers Development Association (Safda) noted that small-scale sugarcane growers have halved over the past two decades – from 50 000 to 25 000 — amid high costs, unequal markets and structural barriers.*		

Thaicom harnesses Thai-made AI to boost agriculture and curb pollution [Thailand]

	The Nation	**October 31, 2025**	**https://www.nationthailand.com/business/tech/40057585**
	Thaicom has developed a system that integrates satellite imaging with artificial intelligence (AI), entirely created by Thai experts. The data and knowledge generated remain within Thailand, aiming to bring the benefits of outer-space technology down to earth—enhancing local livelihoods, particularly in agriculture. *"We've found that semi-forest farmland, such as oil-palm plantations, has great potential for carbon storage," Patompob said. "By combining satellite imagery with AI, we can assess this potential more precisely than manual field surveys, achieving nationwide coverage."* *Sugarcane management: Thaicom collaborates with the Office of The Cane and Sugar Board, using satellite data to oversee and curb crop-burning. The pilot already covers one million rai (out of Thailand's 10 million rai of cane fields), and further expansion with the Industry Ministry is under way.*		

Latest Research

The genomic footprints of wild *Saccharum* species trace domestication, diversification, and modern breeding of sugarcane

Sugarcane is a major crop of unclear origins due to its complex polyploid interspecific genome. We analyzed genome ancestries using whole-genome sequence data from 390 representative accessions based on repeated k-mers and chloroplast phylogeny. The results provided evidence that Saccharum officinarum was domesticated in the New Guinea region from the S. robustum wild species and revealed that its genome is a mosaic involving different S. robustum subgroups. We discovered a wild Saccharum contributor to most modern cultivars, likely originating from East Melanesia. We highlighted two early centers of sugarcane diversification associated with human transport, one in continental Asia through hybridization with different S. spontaneum subgroups and one in the Melanesian and Polynesian islands via hybridization with the discovered ancestor and Miscanthus. Finally, we revealed the genome ancestry of modern cultivars, highlighting untapped wild Saccharum diversity as a source of alleles for breeding programs.

Published October 14, 2025

> Link

Transcriptome and WGCNA analysis revealed the molecular mechanism of drought resistance in new sugarcane varieties

Drought stress is a major abiotic factor limiting sugarcane productivity. However, the molecular mechanisms conferring drought resistance in sugarcane are not fully elucidated, which hinders the breeding of resilient varieties. Three experimental sugarcane varieties were subjected to polyethylene glycol (PEG6000)-simulated drought stress. Subsequent transcriptomic analysis was performed by integrating second-generation (Illumina) and third-generation (PacBio) sequencing technologies. This approach yielded a comprehensive transcriptome landscape. Bioinformatics analyses included gene annotation, differential expression screening, Weighted Gene Co-expression Network Analysis (WGCNA), and network visualization using Cytoscape.

Sequencing generated a total transcript length of 77,930,985 bp, identifying 40,359 unique genes, with 38,791 successfully annotated. Under drought stress, the variety ZZ9 exhibited significant enrichment and upregulation of metabolic pathways related to photosynthesis, plant hormones, polysaccharide synthesis, and amino acid metabolism. Several transcription factor families, including bHLH, bZIP, ERF, NAC, MYB,

and GRAS, were drought-inducible. WGCNA identified 22 co-expression modules, with the MEten module showing the highest correlation with drought response. Key hub genes within MEten included NACA1, ABA-related genes, ERA1, PER70, ATX, two superoxide dismutase genes (SODF1 and SODF2), two late embryogenesis abundant (LEA) genes, and two lipoxygenase (LOX) genes. Furthermore, Cytoscape-based analysis pinpointed the novel gene PSY1 and two additional candidates potentially involved in photosynthetic regulation during drought.

By integrating multi-platform transcriptomics and systems biology approaches, this study delineates potential molecular regulatory networks underlying drought resistance in sugarcane. The identified hub genes and pathways provide critical resources for future functional genomics studies an

Published November 7, 2025

> **Link**

Recent Developments in the Valorization of Sugarcane Bagasse Biomass via Integrated Pretreatment and Fermentation Strategies

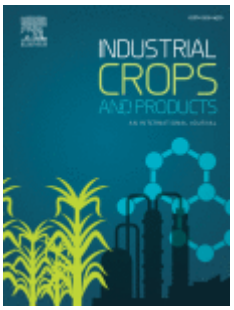
fermentation

The growing global demand for clean energy and sustainability has increased interest in lignocellulosic biomass as a viable alternative to conventional fossil fuels. Among the various biomass resources, sugarcane bagasse, an abundant agro-industrial by-product, has emerged as a promising feedstock to produce renewable fuels and value-added chemicals. Its high carbohydrate content offers significant potential for bioconversion. However, its complex and recalcitrant lignocellulosic matrix presents significant challenges that necessitate advanced pretreatment techniques to improve enzymatic digestibility and fermentation efficiency. This review consolidates recent developments in the valorization of sugarcane bagasse focusing on innovative pretreatment and fermentation strategies for sustainable bioethanol production. It emphasizes the synergistic benefits of integrating various pretreatment and fermentation methods to improve bioethanol yields, reduce processing costs and enhance overall process sustainability. This review further explores recent technological advancements, the impact of fermentation inhibitor, and emerging strategies to overcome these challenges through microbial strains and innovative fermentation methods. Additionally, it highlights the multi-faceted advantages of bagasse valorization, including waste minimization, renewable energy production and the promotion of sustainable agricultural practices. By evaluating the current state of research and outlining future perspectives, this paper serves as a comprehensive guide to advancing the valorization of sugarcane bagasse in the transition towards a low-carbon economy. The novelty of this review lies in its holistic integration of technological, economic, and policy perspectives, uniquely addressing the scalability of integrated pretreatment and fermentation processes for sugarcane bagasse, and outlining practical pathways for their translation from laboratory to sustainable industrial biorefineries within the circular bioeconomy framework.

Published: November 6, 2025

> Link

Sustainable and efficient valorization of sugarcane bagasse: Integrated conversion of holocellulose into acetone, butanol, and ethanol



The hemicellulose fraction of biomass as a fermentable carbon source is typically discarded in the most common biofuel production processes, directly impacting the overall conversion efficiency of hemicellulose-containing lignocelluloses, such as sugarcane bagasse (SB). In this study, an integrated process was developed to efficiently convert both the hemicellulose and cellulose content of SB into acetone, butanol, and ethanol (ABE), employing Clostridium acetobutylicum. The process comprised dilute acid hydrolysis, organosolv pretreatment, enzymatic hydrolysis, and fermentation. To ensure a sustainable process, the primary fermentation byproducts (i.e., acetic acid and butyric acid) were utilized as the acidic agents in the dilute acid hydrolysis of hemicellulose for xylose recovery. The amount of xylose obtained at 180 °C was 22.3 %, significantly higher than that at 150 °C, which was 7.6 %. Furthermore, purified lignin was obtained as a byproduct through ethanolic delignification, where trace acids remaining on the substrate from the dilute acid hydrolysis step enhance the delignification process. Fermentation of mixed detoxified dilute acid hydrolysate and enzymatic hydrolysate resulted in a significant increase in ABE production, elevating it from 9.9 to 12.23 g/L in the best case. This integrated and sustainable process suggests a promising approach for the efficient valorization of xylose-rich lignocellulosic materials such as SB.

Published November 2, 2025

> Link

GHG impact assessment of Bagasse pellets for energy use: Consultancy project for Solidaridad

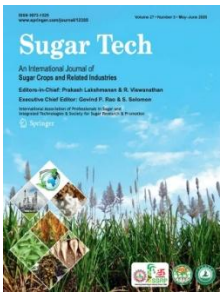
This study provides evaluation of the overall GHG impacts of a possible supply chain of sugarcane bagasse pellets from Brazil (Sao Paulo State) to the Netherlands for power generation. The GHG methodology laid down in the EU Renewable Energy Directive (REDII, Directive 2018/2001) was followed for performing the calculations. The impacts from this supply chain was compared with fossil fuel comparator and also with wood pellets supplied from the North America. This comparison allows to see potential of bagasse pellets for meeting renewable energy targets and substituting wood pellets. Furthermore, discussion was made on the sensitivity of the results for key parameter choices and recommendations were provided for ensuring sustainability of the supply chain such as the consideration of displacement effects of exporting bagasse pellets. The research was conducted independently to support Solidaridad in their

consideration of potential role Brazilian sugarcane residues can play in the Dutch bioeconomy.

Published: November 2025

> **Link**

Assessment of Interspecific Hybrids of *Saccharum spp.* for Morpho-Physiological Traits and Identification of Drought-Tolerant Genotypes

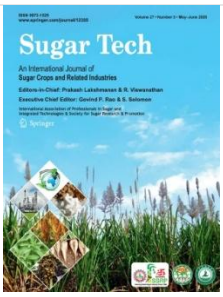


One of the most important abiotic stressors that severely limits sugarcane yield globally is drought, which also affects plant growth and decrease the crop's industrial productivity. Investigating the responses of sugarcane hybrids under drought conditions through various morpho-physiological traits will aid in the selection of drought-resistant varieties. Twelve morpho-physiological traits differentiated 54 sugarcane hybrids under both normal and drought stress conditions. Three groups based on yield potential in control conditions were constituted to assess the traits change among the groups under stress. Among the hybrids 20–1132(ISH 631) was identified with high/medium yield potential with low/medium reduction, 07–776 (ISH 632) and 04–492 (ISH 633) with less reduction in cane yield and other morpho-physiological traits indicating its drought tolerance potential. Correlation studies showed significant positive association of number of millable canes (NMC), total dry matter (TDM), and single cane weight (SCW) in both environments with cane yield, whereas infrared (IR) and canopy temperature depression (CTD) showed significant negative correlation. Relative water content (RWC) demonstrated a positive correlation with cane yield in drought conditions, highlighting its significance in maintaining water status under stress. Drought indices such as mean productivity, modified stress tolerance index, mean relative performance, relative efficiency index, geometric mean productivity, stress tolerance index, relative decrease in yield, and drought tolerance efficiency differentiated the genotypes and expressed significant correlations with yields in both environments. Biplot study indicated that the first two principal components (PCs) accounted for the majority of the variance of which PC 1 explained 48.06% of the total variability, which was influenced by cane yield, TDM, SCW, and cane height (CH). PC2, explaining 13.46% of the overall variation, was contributed by CTD followed by IR. Drought-tolerant hybrids may be exploited in breeding or molecular programs as donor sources to reveal the genomic regions governing for the drought resistance in sugarcane.

Published: November 21, 2025

> **Link**

Strategies for the Development of Sugarcane Ecotourism in Veracruz, Mexico

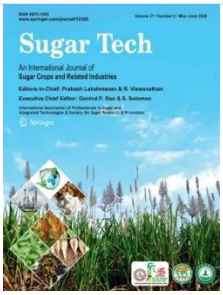


The sustainability of the sugar industry has been managed by agroecological technological packages in conjunction with advances in fertilization, phytosanitary management, and industrial transformation, mainly in the diversification towards bioenergy such as ethanol, cogeneration, and recently biohydrogen. However, the sugar industry has a cultural, historical, anthropological, and socioecological heritage that has not been a factor in the development of sugarcane regions. This work developed strategies to economically exploit sugarcane farms, sugarcane plantations, non-centrifuged sugar production, sugar mills, the sugarcane landscape, and a sugarcane route in the Cordoba-Gulf sugarcane region in Veracruz, Mexico. An economical option for sugarcane and sugar production tourism is described after a series of interviews with tourism service owners and potential visitors, social participation techniques, GIS information, historiography, and bibliometric analysis. There is a growing interest in participating in the agro-industrial chain of sugarcane production, industrial heritage, ecotourism services, and historical and social values, as well as the establishment of a museum of the sugar industry with 500 years of history in the region.

Published: November 18, 2025

> **Link**

Insights into the Role of Climate Change on Major Sugarcane Diseases and Their Mitigation Strategies



Sugarcane (Saccharum spp. hybrid), a tropical grass cultivated across more than 100 countries, produces the highest biomass among major crops. However, its productivity is increasingly challenged by diseases, many of which are intensified by climate change. This review critically examines how environmental stressors high humidity, narrow temperature ranges, waterlogging, drought, and warm winters amplify the spread of fungal, bacterial, and viral pathogens. It also highlights the role of sucking pests in transmitting viruses and the emergence of more virulent pathotypes that undermine elite varieties. To address these threats, the review outlines integrated mitigation strategies, including sustainable crop and soil management, disease-free seed systems, precision agriculture, and climate-resilient cultivars. The importance of predictive modeling is also underscored for timely disease forecasting and control. Together, these insights offer a forward-looking framework for managing sugarcane diseases amid changing climatic conditions.

Published: November 12, 2025

> **Link**

Events

AFCAS Association Francophone de la Canne à Sucre	**AFCAS Day/Journée AFCAS** *Association Française de la Canne à Sucre (AFCAS)* **15 December 2025, 9:00-16:00** **Paris, France** > **Link**
SUGAR INDUSTRY INNOVATION SYMPOSIUM and EXPO	**The Sugar Industry Innovation Symposium & Expo 2025 – TUSONGE Edition** *Kenya Sugar Board* **2-4 December 2025** **The Grand Royal Swiss Hotel, Kisumu** > **Link**
Africa Sugar by informa	**Annual Africa Sugar Conference** *Informa* **14-15 April 2026** **Nairobi, Kenya** > **Link**

	SIT Annual Technical Meeting 2026 *Sugar Industry Technologists (SIT)* **19-22 April 2026** **Cincinnati, Ohio, USA** > **Link**
	Annual Conference of the Australian Society of Sugar Cane Technologists (ASSCT) *Australian Society of Sugar Cane Technologists (ASSCT)* **21-24 April 2026** **Mackay, Australia** > **Link**
	American Society of Sugar Cane Technologists (ASSCT) – Annual Joint Meeting *American Society of Sugar Cane Technologists (ASSCT)* **17-19 June 2026** **Sheraton New Orleans** **New Orleans, USA** > **Link**

fenasucro & agrocana	**Fenasucro & Agrocana 2026** *American Society of Sugar Cane Technologists (ASSCT)* **11-14 August 2026** **Sertãozinho – SP, Brazil** > **Link**
SASTA	**SASTA Congress** *South African Sugar Technologists' Association* **18-21 August 2026** **Durban, South Africa** > **Link**