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Welcome to the ISSCT Bulletin for April 2026, 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

Sugarcane Ethanol: A Strategic Buffer Against Global Oil Price Volatility

Mr. Lindsay Jolly, Director, We Know Sugar Consulting (WKS), Australia



Global oil markets have entered another period of sharp volatility, driven by geopolitical conflict and supply disruptions in the Persian Gulf that have pushed crude prices significantly higher and created uncertainty about the global supply of fossil fuels. Energy intensive industries such as transport, chemicals, food processing, and fertiliser production are feeling the strain of higher oil prices, and many countries lack effective buffers against sustained fossil fuel price spikes. Brent crude prices in the first two weeks of April averaged around USD124/bbl, up from no more than USD65-70/bbl prior to the conflict. It is possible crude oil prices will strengthen further in the coming months.

High crude oil prices are rippling through economies, pushing up the cost of living and tightening financial conditions. When Brent surges, transport and freight costs rise almost immediately, feeding into higher prices for food, manufactured goods, and essential services. Gasoline is especially influential: as pump prices climb, households face reduced disposable income, while businesses see margins squeezed, slowing hiring and investment. Because fuel is a universal input, these increases flow straight into headline inflation, forcing central banks to keep monetary policy tighter for longer and dampening overall economic activity.

In this high oil price environment, sugarcane is a strategic asset because sugarcane ethanol acts as a natural shock absorber with ethanol prices only partially influenced by crude oil prices because policy settings, gasoline pricing formulas, the sugar-ethanol arbitrage, and regional logistics all shape ethanol markets independently of movements in Brent. More broadly, sugarcane can serve as a cornerstone of the emerging circular bioeconomy, supplying renewable fuels including sustainable aviation fuels, electricity, and industrial feedstocks.

Sugarcane-based ethanol production can utilise either cane juice directly or molasses, a distinction critical to understanding global production patterns. Direct cane juice fermentation is practised primarily in Brazil and to a lesser extent in India. Brazilian mills typically feature integrated operations producing both sugar and ethanol, with operational flexibility to shift production between products based on relative market prices. This flexibility provides economic resilience and responsive supply to changing market conditions. Molasses-based ethanol production represents the dominant pathway in most sugarcane-growing regions outside Brazil and India. Molasses, the thickened dark syrupy residue from sugar production, has approximately 40–55% fermentable sugars. The molasses-based ethanol production model is prevalent in Thailand, Pakistan, the Philippines, and numerous sugarcane-producing nations where sugar manufacturing remains the primary objective and ethanol production serves as a value-added utilisation of molasses. Beet juice and beet molasses are also used in some European countries for fuel ethanol.

Ethanol as a Natural Shock Absorber

Beyond energy security, ethanol programmes reflect broader geopolitical strategies. Developing domestic renewable fuel capacity reduces exposure to petroleum supply disruptions from politically unstable regions or adversarial states. So, one of sugarcane's most important contributions lies in its ethanol. When oil prices rise, ethanol becomes more competitive, reducing the cost of blended fuels. Countries with mature ethanol programmes, such as Brazil and India, consistently experience lower volatility in retail fuel prices. Flex fuel vehicle fleets further enhance this resilience by allowing consumers to switch between gasoline and ethanol depending on relative prices.

The dominant fuel distributor in Brazil is Petrobras, which is majority-owned by the state. Petrobras fixes the ex-refinery price of gasoline, partly in reference to international energy markets but also partly to achieve the government's objectives. Petrobras doesn't often change its gasoline price and tends to adjust faster when international prices are falling and slower when they are rising. Today, Brazilian gasoline prices are roughly 50% below elevated international gasoline prices and Petrobras has indicated that for the time being it won't pass the energy market volatility through to consumers. The longer the conflict persists, the harder it will be for Petrobras to maintain this view. Today, Brazilian hydrous

ethanol prices are close to 15.50c/lb in raw sugar equivalent terms. According to Cznarikow, if at some point Petrobras needs to pass through the full cost of more than USD 100/bbl crude oil with the USD/BRL at 5.2, and assuming an ethanol/gasoline pump parity at 65%, then local ethanol prices could rise to 18c/lb sugar equivalent. Even so, the likelihood of Petrobras reacting and raising gasoline prices is difficult to foretell and, in any case, price increases would more than likely be carefully managed partial rises. Meanwhile Brazil's sugarcane industry says it will increase ethanol supply by nearly 4 bln liters in the 2026/2027 harvest that is just beginning and therefore provide additional protection to consumers.

In India there are moves to increase ethanol's importance. There's been talk of increasing ethanol blending in gasoline beyond 20% and using ethanol in the place of LPG for domestic supply given the disruption caused by the Persian Gulf war.

Elsewhere, the Philippines is looking to import more ethanol from the world market to meet its E10 blend obligation and Vietnam is looking to roll out a mandatory E10 blend in June. Vietnamese import taxes on ethanol were suspended this month. Thailand seems set to incentivize use of E20 over E10. E20 is now cheaper at the pumps for the first time in almost a decade. Higher utilization of molasses for ethanol production rather than for export is the likely outcome.

A Highly Efficient Biofuel Crop

Sugarcane remains the most efficient biofuel crop in commercial use. It delivers the highest energy yield per hectare and a strongly positive energy balance, returning eight to ten units of energy for every unit invested. This efficiency underpins the reliability of ethanol supply and strengthens the economic case for expanding cane based bioenergy systems.

Reducing Dependence on Fossil Fuels

Ethanol blending mandates — from E10 to E27 — directly reduce gasoline demand and help shield economies from oil price spikes. Flex fuel vehicle fleets further enhance system flexibility by allowing consumers to switch fuels based on real time price differentials. Again, according to UNICA, in Brazil, nearly 40 million cars and motorcycles with flex-fuel technology are in circulation so Brazilian motorists have something rare internationally: the ability to choose between two fuels,

delivering real savings at the pump. Industry association UNICA estimates that in 2024, the price advantage of hydrous ethanol over gasohol (containing 25% anhydrous ethanol) resulted in average savings of 11% for consumers, while in 2025 ethanol's energy cost remained 7% lower than gasolines. UNICA also observes that over a longer-term perspective, the greatest benefits occurred precisely during periods of greater pressure on international oil prices, when ethanol's presence in Brazil's fuel mix helped cushion the impacts of these fluctuations on fueling costs.

Beyond transportation, in industrial applications, ethanol provides a renewable feedstock for solvents, plastics, and chemical intermediates, enabling partial substitution away from petroleum derived inputs.

Co Products That Strengthen Industrial Resilience

Sugarcane's value extends well beyond ethanol. Bagasse provides renewable electricity that can displace diesel-based generation, reducing exposure to fossil fuel price swings. Vinasse and filter cake, whilst a feedstock for biogas, also support nutrient recycling and soil improvement, lowering fertiliser requirements at a time when global fertiliser prices remain elevated. Together, these co products enhance the economic and environmental sustainability of cane growing regions.

Ethanol also serves as a platform chemical for producing ethylene, butadiene, ethyl acetate, acetic acid, and various intermediates for plastics, solvents, and specialty chemicals. Bioethylene enables chemical manufacturers to reduce carbon intensity while maintaining performance. These attributes help industries meet ESG and decarbonisation targets more cost effectively than many fossil fuel alternatives.

Supporting Cleaner, Lower Carbon Industrial Pathways

Cane ethanol delivers substantially lower greenhouse gas reductions compared to gasoline on a lifecycle basis. Regardless of which feedstock is used, sugarcane mills benefit from energy cogeneration. After juice extraction, the remaining fibrous residue (bagasse) serves as a biomass fuel for steam and electricity generation. Modern mills in major producing regions are typically energy self-sufficient, in both steam and electricity, with many selling surplus electricity to the

grid. This bagasse cogeneration can substantially improve the greenhouse gas emissions profile of sugarcane ethanol.

Multiple lifecycle assessment frameworks have been developed by different jurisdictions and institutions, each reflecting distinct methodological choices, data sources, and policy objectives. GREET (Greenhouse gases, Regulated Emissions, and Energy use in Transportation), developed by the US Argonne National Laboratory, represents a widely utilised model. Employing a comprehensive well-to-wheels approach, GREET tracks emissions from feedstock cultivation to fuel combustion, incorporating detailed data on agricultural inputs, processing energy, co-product credits, and transportation. Current GREET methodology shows US maize ethanol achieving lifecycle emissions reductions of 40–50% compared to petroleum petrol, with variation based on facility energy sources and agricultural practices. Brazilian sugarcane ethanol demonstrates higher reductions of 60–70% or more, reflecting simplified processing and cogeneration benefits.

A Stabilising Force for Rural Economies

Sugarcane industries underpin rural employment, energy security, and local fuel supply. By reducing dependence on imported fossil fuels, cane producing countries strengthen their economic resilience. Bioenergy clusters built around sugarcane stimulate investment in logistics, power generation, and agro industrial development, creating broader societal benefits.

Ethanol production creates demand for agricultural commodities, supporting farm incomes and rural economies. This socio-economic dimension has proven influential in policy formation, particularly in major agricultural producing nations where rural constituencies wield significant political influence. Beyond farm-level impacts, ethanol production facilities represent significant capital investments in rural areas, generating industrial employment, supporting service sectors, and contributing to the local economy.

A Strategic Opportunity for the Bioeconomy

As oil prices rise and decarbonisation pressures intensify, sugarcane's versatility becomes increasingly valuable. The crop can serve as a cornerstone of the emerging circular bioeconomy, supplying renewable fuels including sustainable aviation fuels through the alcohol to jet route, bioelectricity, and industrial

feedstocks. For countries with established cane sectors, this moment represents a strategic opportunity to expand ethanol, biogas, and biochemical capacity — enhancing energy security while advancing low carbon industrial development.

Conclusion

Sugarcane is far more than a commodity crop. It is an integrated energy system, a stabiliser against oil market volatility, and a practical pathway to cleaner industrial development. As global oil prices continue to rise, sugarcane's role in supporting energy security, reducing emissions, and strengthening economic resilience has never been more relevant.

The Commitment to Expand Ethanol Supply: Energy Security and Protection for the Brazilian Consumer

Mr. Luciano Rodrigues, Director Economics and Strategic Intelligence, União da Indústria de Cana-de-Açúcar e Bioenergia (UNICA), Brazil



The world is currently experiencing a period of geopolitical instability. International conflicts have disrupted the oil market, driving up prices and creating uncertainty about the global supply of fossil fuels.

In many countries, this situation creates immediate pressure on the economy and on the population's cost of living. Rising fuel prices directly affect transportation, inflation, and economic activity.

Brazil, however, has a strategic advantage built over decades. While much of the world relies exclusively on gasoline to fuel its light-vehicle fleet, the country has developed a unique energy model based on the coexistence of gasoline and ethanol.

Thanks to *flex-fuel* vehicle technology—which today includes nearly 40 million cars and motorcycles in circulation—and to domestic ethanol production,

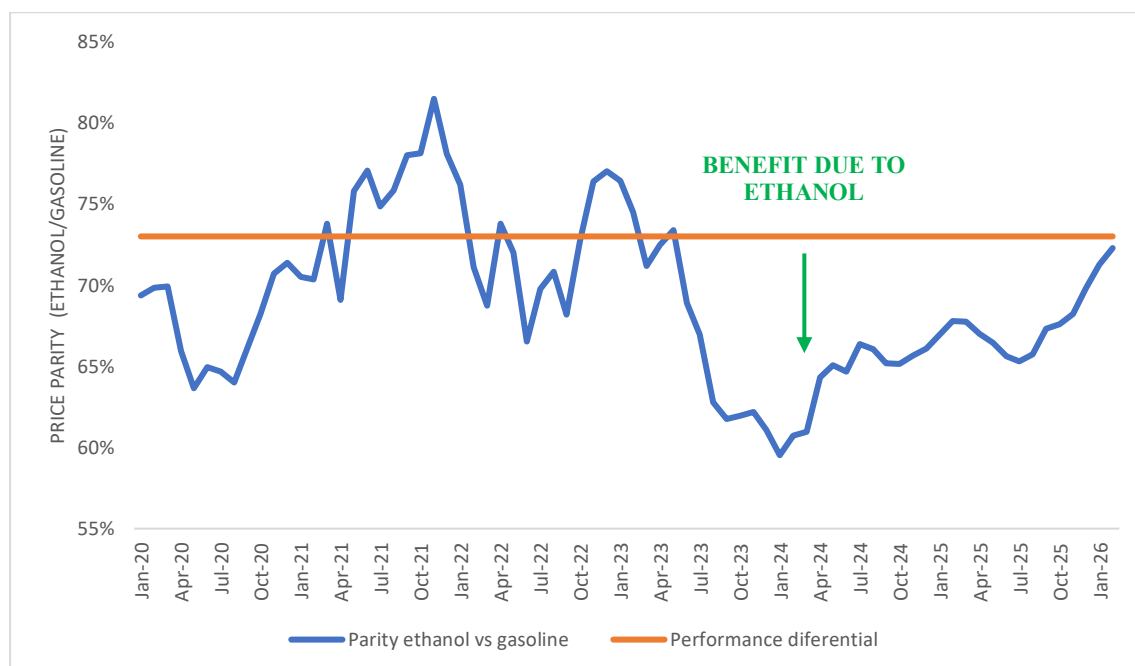
Brazilians have access to something rare internationally: the ability to choose between two fuels, delivering real savings at the pump.

At a time when the world faces renewed uncertainty in energy markets, Brazil's sugarcane energy sector will increase ethanol supply by nearly 4 billion liters in the 2026/2027 harvest, just beginning. A record level of output, this volume represents the largest ethanol supply ever recorded in the country since the start of the national ethanol program in the 1970s.

This expansion will strengthen Brazil's energy sovereignty and increase the presence of a competitive product in the domestic market, providing additional protection for consumers.

The charts below, which detail average pump prices in the State of São Paulo illustrate this condition in a straightforward way. Chart 1 shows that over the past three years, the price of ethanol remained below the technical parity threshold of 73% in virtually every month. This percentage represents the average difference in fuel efficiency between the two fuels, that is, the point at which ethanol becomes economically more advantageous for consumers. In practice, whenever ethanol's price is below that limit, fueling with the biofuel becomes the more economical choice for *flex-fuel* vehicle owners.

Chart 1. Price relationship of hydrous ethanol / gasoline (parity) to consumers in the State of São Paulo.



The same dynamic can be seen from another angle in Chart 2, which compares the prices of these fuels per unit of energy, expressed in Reais per megajoule. By analyzing the cost of energy delivered to the vehicle, hydrous ethanol is shown to have maintained a lower energy cost than gasoline, ensuring real savings per kilometer driven.

Chart 2. Hydrous ethanol and gasoline prices to consumers in the State of São Paulo, in R\$ per megajoule (R\$/MJ).



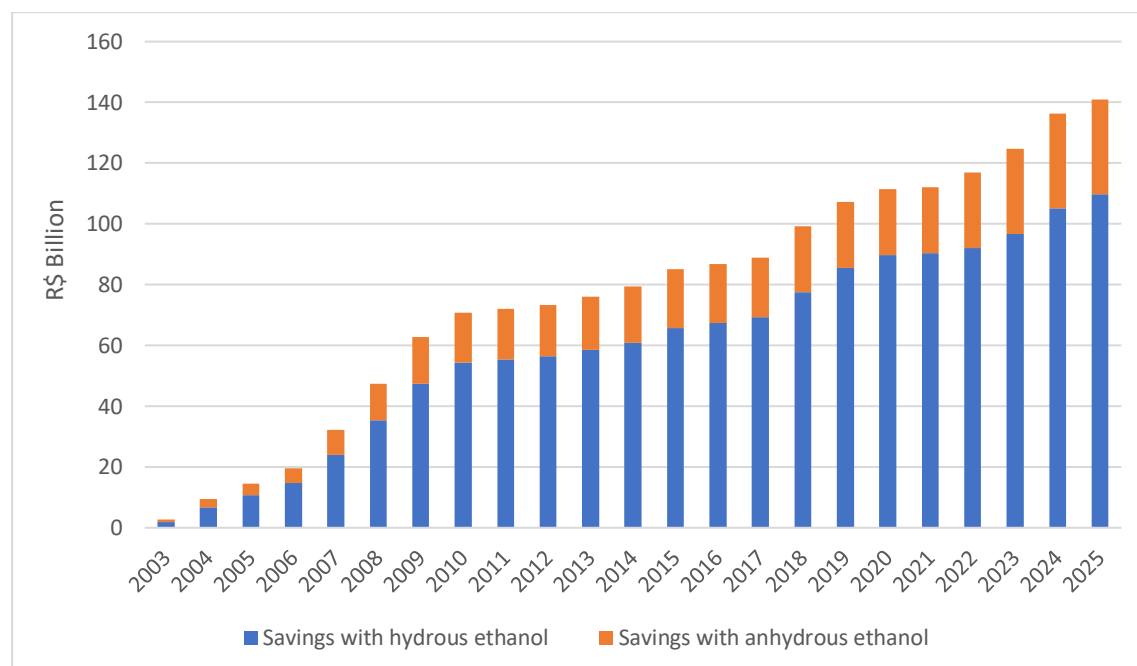
In 2024, this energy advantage resulted in average savings of 11% for consumers, while in 2025 ethanol's energy cost remained 7% lower than that of gasoline.

When this calculation is expanded to the entire country—considering both hydrous ethanol, used directly by *flex-fuel* vehicles, and anhydrous ethanol, which is mandatorily blended into gasoline—it becomes possible to gauge the economic impact associated with the presence of the biofuel.

In this context, consumer savings generated in Brazil in 2025 are estimated to have reached approximately R\$ 5 billion. Adding the savings since the introduction of *flex* vehicles in the Brazilian market, ethanol use has already provided more than R\$ 140 billion in cumulative savings for consumers (Chart 3).

It is also evident that the greatest benefits occurred precisely during periods of greater pressure on international oil prices, when ethanol's presence in Brazil's fuel mix helped cushion the impacts of these fluctuations on fueling costs.

Chart 3. Cumulative savings generated for consumers by ethanol use in Brazil, in R\$ billions.



This progress did not happen by chance. It is the result of consistent public policies aimed at strengthening the energy transition and bioenergy in Brazil.

Among the recently implemented policies are: the recent increase in the mandatory ethanol blend in gasoline from 27% to 30%; the implementation of the biomethane program; adjustments to and strengthening of the National Biofuels Policy; the program for the use of sustainable aviation fuel on domestic flights; and the regulatory framework for carbon capture and storage associated with bioenergy, among others.

Added to these initiatives is the concrete prospect of further increasing the ethanol blend in gasoline, reinforcing the commitment to keep fuels competitive in the domestic market precisely at a time of greater volatility in the international energy landscape.

As a result of this favorable environment, Brazil's ethanol production capacity has grown by 30% over the past five years, driven with investments in new industrial units, expanded output at existing plants, and technological advances that increase efficiency across the production chain. Today, ANP lists nearly 20 new plants under construction in the country.

The ethanol program was created in the 1970s precisely to mitigate price and supply shocks in the international oil market. Today, with a large flex fleet, certified domestic production, and an audited carbon footprint, Brazil can fulfill this role even more efficiently—both economically and environmentally.

Expanding ethanol supply will also play a fundamental role in the balance of refined products. This is because, in 2025, Brazil needed to import about 3.5 billion liters of gasoline. The expected growth in ethanol production this year represents nearly the same volume as gasoline imports, creating conditions to significantly reduce the country's exposure to supply swings in the international fuels market.

This contribution has a direct impact on people's lives. It is a tangible benefit for millions of Brazilians. It is income that remains in families' pockets and can be allocated to other goods and services, also contributing to the dynamism of the national economy.

At a time when many countries face growing pressure on energy prices, Brazil demonstrates that it is possible to respond with economic efficiency, environmental leadership, and a long-term strategic vision.

Summaries of papers and posters presented at the ISSCT XXXII Centennial Congress held in August 2025 in Cali, Colombia

Agronomy Section

by Dr Hardev S. Sandhu, Agriculture Commissioner and Chair ISSCT Agronomy Section



Besides the regular paper and poster sessions, there was a special session on a review of agronomic research presented at the ISSCT congresses in last 100 years. Four review papers (1924–1938; 1950–1974; 1975–1999; 2000–2023), 29 oral papers and 19 posters were presented at the centennial congress.

Review papers:

Agronomic research presented at ISSCT congresses from 1924 to 2023 reflects the evolution of sugarcane production from early technical discussions to highly integrated, sustainability-focused systems. Initial meetings emphasized knowledge sharing, while the mid-20th century saw major advances in fertilizer management, irrigation efficiency, crop physiology, and yield improvement. Between 1977 and 1999, research expanded into nutrient optimization, mechanized harvesting, weed control, planting systems, and ratoon management, significantly boosting productivity. From 2001 onward, the focus shifted toward sustainable farming systems, best management practices, soil health, climate adaptation, and precision technologies. Overall, ISSCT agronomic research has progressively enhanced sugarcane productivity, efficiency, and environmental sustainability worldwide.

Research papers and posters:

The agronomy papers and posters at the ISSCT congress in Cali, Colombia were primarily focused on the following key technical themes:

1. Accelerating Variety Adoption and Crop Establishment

Presentations emphasized strategies to shorten varietal adoption cycles, enhance seedcane quality, and promote genetic diversity. Post-release evaluation trials, participatory research approaches, and optimized planting strategies were highlighted as critical tools to improve yield stability and industry responsiveness.

2. Precision Nitrogen and Nutrient Management

Nitrogen-use efficiency (NUE) was a dominant topic. Updated nitrogen recovery coefficients, economic sensitivity analyses of fertilizer rates, and soil-based site-specific management approaches were presented. Decision-support tools such as fertilization advisory systems demonstrated how digital platforms can optimize nutrient management while improving profitability and environmental stewardship.

3. Intercropping and Diversified Production Systems

Research from multiple regions demonstrated that intercropping enhances farm profitability, soil health, and system resilience. Cover crops and diversified cropping arrangements were shown to reduce risk, improve resource use efficiency, and strengthen farmer livelihoods.

4. Energy cane and Biomass Expansion

Energy cane was presented as a promising crop for biomass production on marginal or fallow lands. Studies demonstrated its potential to diversify revenue streams, enhance ecosystem services, and support bioenergy development without displacing traditional sugar production.

5. Sustainability, Soil Health, and Environmental Metrics

Environmental performance metrics, including carbon footprint analysis and soil biological indicators, featured prominently.

Research addressed irrigation water quality, vinasse impacts, soil-health promoters, and climate-resilient amendments, reinforcing the importance of integrating environmental accountability into production systems.

6. Crop Physiology and Yield Enhancement Technologies

Studies on plant growth regulators, biostimulants, and physiological monitoring tools demonstrated opportunities to increase millable biomass and improve crop performance under variable environmental conditions.

7. Weed Science and Integrated Crop Protection

New herbicide options, weed ecology assessments, and standardized experimental practices were presented to support effective and sustainable weed management strategies.

8. Digital Agriculture and Predictive Analytics

Advancements in machine learning, in-field sensors, and predictive modeling highlighted the rapid integration of precision agriculture technologies. Tools for sucrose prediction, in-stalk Brix measurement, and photosynthesis modeling represent important steps toward data-driven crop management.

Overall Conclusions

The research presented in the agronomy section of the ISSCT congress clearly demonstrated that future sugarcane production systems must move beyond yield maximization alone. The prevailing direction of research integrates:

- *Precision nutrient and input management*

- *Carbon and environmental accountability*
- *Soil health-centered production*
- *Cropping system diversification*
- *Biomass and energy integration*
- *Digital decision-support technologies*
- *Grower-engaged, participatory research*

Collectively, the agronomic research presented in Cali underscores a global commitment to developing sugarcane systems that are productive, profitable, climate-resilient, and environmentally sustainable.

Germplasm & Breeding Section

by Dr George Piperidis, Chair ISSCT Germplasm & Breeding Section

The Germplasm & Breeding section of the XXXII ISSCT Congress featured thirteen full papers and twelve posters.

Research in Germplasm & Breeding over the last 100 years

Invited papers reviewing the last 100 years of Germplasm & Breeding research were prepared in four 25-year periods by Raul Castillo, Anthony Kennedy (2 papers) and Goolam Badaloo. The major topics covered in these review papers include the recognition of sugarcane's narrow genetic base and subsequent developments in germplasm collection, evaluation, and characterisation, followed by diversity studies and strategies to broaden the genetic base; establishment of the ISSCT World Sugarcane



Collections; use of photoperiod facilities for controlled cross pollination; selection schemes, and breeding for resistance to pests and diseases. The reviews also highlighted advances in genotype x environment interaction studies; implementation of family selection; variety adaptation to stress environments, and breeding for high biomass production and alternative end products.

Germplasm & Breeding papers presented at the XXXII Congress

The main theme across the 13 Germplasm & Breeding papers presented at the Congress was the increasing integration of genomic approaches—including genome-wide association studies (GWAS), genomic selection (GS), and marker-assisted breeding—into breeding programs. Jean-Yves Hoarau from eRcane used a GWAS approach to dissect the genetic basis and origin of resistance to orange rust and yellow leaf and revealed novel QTLs for both diseases. Fernando S. Aguilar from Cenicaña evaluated markers associated with several traits and reported prediction accuracies of 0.64 for sucrose accumulation, 0.63 for stalk diameter, 0.4 for plant height, and 0.59 for waterlogging tolerance. These results provided a strong foundation for implementing a genomic prediction-assisted breeding scheme at the first stage of clonal selection.

Karen Aitken from Australia presented a GS study using bi-parental populations and elite clones targeting red rot resistance and sucrose content. Prediction accuracies ranged from 0.5 to 0.72 for sucrose content and from 0.4 to 0.52 for red rot resistance, with Bayes B reported to be the most effective model for predicting red rot resistance. Josefina Racedo presented preliminary results on the prediction accuracy of genomic breeding values in the EEAOOC breeding program, using three breeding populations and early maturity traits.

The studies presented by Zhou from SASRI and Zuniga from Cenicaña investigated the additive and non-additive genetic components of

sucrose content in Stage 1 families. Both studies concluded that additive genetic effects predominate over non-additive, supporting breeding strategies that focused on parental selection and effective use of breeding values in selecting parents.

Hardev Sandhu (USA) reported significant genetic gains for yield-related traits following the initiation of selection at the seedling stage in Florida's sandy soils. Genetic gains were observed for both cane yield and sucrose content, with no evidence of a yield plateau for either of these traits for sandy soils. Fredy Salazar (CENICAÑA) presented research on the effects of inbreeding on agronomic and yield traits in five selfed progeny populations. In some cases, inbreeding led to significant reductions in yield and sucrose content compared to the non-inbred populations, while fibre content increased, allowing for the selection of progenies with potential for bioenergy production. The extent of inbreeding depression varied among the varieties, with some of them producing progeny with a favourable accumulation of alleles which could be useful for identifying superior genetic combinations.

Francisca Perera conducted an assessment on genetic diversity and population structure using 350 accessions from the EEACO's germplasm bank. The collection was grouped into three clusters, with a greater percentage of variation within each group than between them. A core collection of 35 genotypes captured almost 96% of the diversity. The effective utilisation of genetic diversity could lead to better strategies for the development of new varieties with superior traits.

Andre Gama (USA) investigated the relationship between genome size and fertility-related traits. Genome size was estimated for 61 parental genotypes, including wild species, using flow cytometry; however, no significant correlations were identified.

Santiago Ostengo from Argentina reported on the development of a selection index based on non-sugar compounds to characterise varieties on their industrial quality. Concentrations of starch, ash, phosphates, phenols and juice colour were measured in 10 varieties across 6 sites over 3 consecutive years. LCP85-384 showed the best industrial suitability based on the non-sugar compounds, while TUC95-10 and TUCCP7-42 had the poorest industrial quality, mainly due to the high starch and ash content, respectively.

Diego Henriquez from Argentina presented an assessment of post-frost sucrose deterioration in five TUC varieties during the 2024 season at two locations. The preliminary results showed clear varietal differences in their response to frost and support the need for variety-specific harvest management strategies. TUC 06-7 and TUC 03-12 showed greater early sucrose stability following frost, while TUC 02-22 and TUC 00-65 showed higher sucrose loss rates.

Rafaella Rossetto (Brazil) described the use of high-throughput phenotyping to evaluate early- and late-flowering sugarcane genotypes via vegetation indices and stalk number. Canopy cover (CC) and excess greenness (EXG) differed between the flowering groups, while plant height and volume showed no differences. These results suggest that CC and EXG are useful traits to be used in association mapping studies for flowering time in sugarcane.

Conclusion

The Germplasm & Breeding contributions at the XXXII ISSCT Congress showed strong progress in integrating genomics, phenotyping, and diversity analysis into sugarcane improvement programs, while also providing a platform for presenters to share preliminary results and receive valuable peer feedback.

Entomology Section

by Dr Julien Beuzelin, Chair ISSCT Entomology Section

Following four reports on 100 years of Entomology, ten Entomology papers and seven posters were presented at the ISSCT XXXII Centennial Congress in Colombia.



100 years of Entomology

Four reports, each highlighting a quarter century of entomological research and its impacts as presented at ISSCT congresses, were delivered to celebrate the first 100 years of the Society. In these presentations, Serino (1924–1938, on behalf of Easdale), Allsopp (1950–1974), Goebel (1975–1999), and Wilson (2000–2023, on behalf of Beuzelin) showed that research on moth borer biology and management was the most frequently addressed topic in sugarcane insect pest management. The most frequently addressed management tactic was biological control. The evolution of chemical control was also discussed.

Environmental factors and agricultural practices

Two papers and three posters addressed the effects of environmental factors and agricultural practices on sugarcane insects. Goebel *et al.* reported that a sugar company in Senegal has reduced *E. saccharina* infestations by integrating varietal resistance, improved agricultural practices, and a large network of solar-powered light traps across more than 10,000 ha. Salvatore *et al.* reported that nitrogen fertilization with urea and irrigation using citrus industry residues or filter cake increased *D. saccharalis* infestation and oviposition in sugarcane in Argentina.

Macé *et al.* reported that white grub infestations in northern Tanzania are strongly associated with soil conditions, with sodic–alkaline soils showing the highest pest levels, followed by alkaline soils. This research, suggesting that soil reclamation might play a role in decreasing *Cochliotis melolonthoides* populations, won the *Ernest Victor Abbott Award* for best Biology poster. Martin *et al.* found that vegetation in the Senegal River Delta, particularly *Typha domingensis* growing in drains and water tanks, may serve as a host for *Eldana saccharina*, potentially contributing to fluctuating pest pressure in sugarcane fields. Salvatore *et al.* reported that *D. saccharalis* preferred sugarcane over four weed species (*Sorghum halepense*, *Urochloa platyphylla*, *Sicyos polyacanthus*, *Tithonia tubaeformis*) for oviposition in cage studies; however, moth laid eggs on all weeds except *S. polyacanthus*.

Conventional and transgenic host plant resistance

Four papers addressed sugarcane resistance to insects. Wilson discussed the need for the evaluation and identification of sugarcane cultivars resistant to two moth borers in Louisiana, *Diatraea saccharalis* and *Eoreuma loftini*. In addition, genotype x environment variation in cultivar resistance levels was highlighted. Lauchande *et al.* reported that Bt sugarcane producing the Cry1A protein significantly reduced *E. saccharina* infestation and stalk damage, while releases of sterile moths showed no measurable effects under greenhouse conditions. Budeguer *et al.* reported that transgenic sugarcane lines producing stacked Cry and Vip Bt proteins showed high levels resistance to *D. saccharalis*, with many lines causing over 90% larval mortality in bioassays. Ramírez *et al.* screened 648 sugarcane genotypes and identified seven with reduced injury from the spittlebug *Aeneolamia varia*. GWAS detected three SNPs and highlighted a detoxification gene, *DTX14*, potentially associated with resistance.

Biological control

Two papers focused on biological control. Echeverri-Rubiano *et al.* reported a shift since 2016 in Colombia's *Diatraea* species, from *D. saccharalis* and *D. indigenella* to *D. busckella* and *D. tabernella*, and recommended increasing releases of *Cotesia flavipes* and *Lydella minense* while conserving broadleaf weeds to maintain *Genea jaynesi* populations. Rivera-Pedroza *et al.* reported that natural vegetation in biological corridors supports key beneficial insects, including the parasitoid *G. jaynesi*, diverse predators, and numerous wild bees, in Colombia.

Sterile insect technique

Two papers reported on sterile insect technique (SIT) studies. Behary Paray and Conlong reported that testing and refining artificial diets using the Carcass Milling Technique alongside published formulations led to the identification of promising diets that improved insect yield and quality for future *Chilo sacchariphagus* SIT programs. Mathonsi *et al.* showed that paper towel was the most preferred oviposition substrate for *Eldana saccharina* under laboratory conditions, while wax paper produced the highest hatching success. Using paper towel for egg laying and wax paper for hatching could improve mass-rearing efficiency for SIT programs.

Biostimulants

Two posters reported results of studies on biostimulants. Budeguer *et al.* reported that sugarcane plants treated with the biostimulant PSP1 (Howler®) sustained reduced *D. saccharalis* injury and activated key defense pathways, including PR1 expression in the salicylic acid pathway. In addition, Padilla *et al.* reported that the biostimulant reduced *D. saccharalis* injury by 4 to 5% in the widely grown sugarcane variety LCP 85-384 across three field seasons in Tucumán, Argentina.

Additional topics

Campo Nuñez and Diaz Huerta reported that sucrose content decreased by 0.044% for every 1% increase in stalks injured by *D. sacharalis* in field surveys in Colombia. In addition, injured stalks were smaller and lighter than uninjured stalks.

Del Pilar Pérez *et al.* reported that chlorantraniliprole provided strong control of *D. saccharalis* with minimal impact on parasitoids although its profitability varied. Methoxyfenozide delivered consistent economic returns and a low environmental footprint.

Conclusion

Entomology papers and posters continued to address traditional and novel tactics for sugarcane insect pest management. Following the workshop report, Entomology Section members discussed ways to strengthen participation within the group, including updating membership lists, expanding involvement, offering student discounts, and using virtual platforms for updates. Members also proposed enhancing knowledge sharing through webinars, improved documentation of workshops, high-quality outreach materials, and development of a joint entomology book or special journal issue.

Outcomes of ISSCT Executive Committee meeting held on 23 March 2026

The ISSCT Executive Committee met virtually on 23 March 2026. The main outcomes were:

- The Audit Report of the Final Accounts for the period 1 March 2023 – 31 August 2025 were approved. The report indicated that the financial situation of the Society was healthy. The report will be considered at the first Council meeting at the XXXIII Congress in Guatemala in 2028 and will be released after approval.
- The Variety Notes Website will be revived and entrusted to the firm Cross Channel Consultancy. It will be under the responsibility of Dr. George Piperidis, Chair ISSCT Germplasm & Breeding Section. The website will be ready by June 2026 and will be hosted by ISSCT.
- Following advertisement and consideration of the CVs of applicants, Dr. Salem Saumtally and Dr. Bryan Lavarack were appointed Assistants to the Editor for the period 1 February 2027 to 31 January 2028. They will be involved in the review of papers and posters for the XXXIII Congress. It is expected that the editorial team headed by Dr. Peter Allsopp will expedite the review process and move the deadline for reception of submissions closer to Congress than has been the case previously.

Latest information on Webinars and Workshops

As conveyed in the February issue of the ISSCT Bulletin, webinars and workshops will be held in the present inter-congress period. The webinar in Pathology is scheduled for 2 June 2026 and the announcement may be accessed through the following link <https://issct.org/2026/03/15/issct-pathology-section-webinar/>

The one on Molecular Biology will be held on 25 June 2026 and an announcement will be uploaded on the ISSCT website shortly.

The combined workshop of the Germplasm & Breeding and Molecular Biology Sections will be held from 9 to 13 November 2026, Hastings, Barbados.

You may access the announcement at <https://issct.org/2026/02/26/first-announcement-joint-14th-germplasm-breeding-and-11th-molecular-biology-workshops/>

Information on the events for the Commissions/Sections will be conveyed as and when ready.

In Memoriam: Dr Claude Ricaud (1935 – 2026)



Dr Claude Ricaud passed away peacefully on Sunday 1 March, 2026 after a brief illness. Born on 9 February 1935 in Beau Bassin, Mauritius, he was the youngest of a family of 9 including 6 sisters.

After his secondary schooling at the Royal College of Curepipe in Mauritius, he joined the Mauritius Sugar Industry Research Institute (MSIRI) in 1956 where he devoted his entire career of 40 years until February 1995. As a laboratory assistant in the Pathology division, he first learned the profession from Prof. Robert Antoine, the Head, who instilled in him a lifelong passion for scientific research. During his early years, the diseases

of the sugar cane that caught his attention were chlorotic streak and ratoon stunting which were causing significant yield losses in sugar cane in Mauritius and other parts of the world.

He simultaneously pursued his university studies and obtained a BSc degree in science from the University of London in 1958, as an external student, which earned him a scholarship for a post-graduate diploma (DIC) at the prestigious Imperial College of Science and Technology of the University of London in 1960. Benefiting from a scholarship from the British Council, he chose the same institution in 1964 for a master's degree. His work proved so original that after additional research, Imperial College awarded him a doctorate (PhD) instead of a master's degree, an exceedingly rare achievement, indicating his stature as a high-level researcher.

His formal studies completed, he devoted all his time to research on cane diseases including gumming, leaf scald, yellow spot, rust and other minor diseases. His work led to significant advances in the understanding of these diseases as well as their diagnosis and control methods.

Dr Ricaud climbed up the ranks: he was promoted to Assistant Pathologist in 1960, Associate Pathologist in 1965, Head of the Division of Pathology in 1969, Senior Scientific Officer in 1978, and Deputy Director in 1980.

During the 1970s, MSIRI's mandate was extended to cover food crops such as potato, tomato, maize and groundnut. As was the case with sugar cane, Dr. Ricaud contributed to controlling the diseases that were inducing severe losses in these crops, notably late blight and potato bacterial wilt. One of his achievements was the establishment of a healthy seed production system for potato in tropical environments, at low altitude, an accomplishment as it is a temperate crop originating from the Andes in Peru.

Dr. Ricaud forged a reputation beyond the borders of Mauritius through his 177 publications. His work was published internationally, especially in the proceedings of the congresses of the International Society of Sugar Cane Technologists (ISSCT). His expertise was requested by various sugar companies in Africa, particularly in Tanzania. He had a vast knowledge of the sugar world through his trips in many countries.

In 1984, he was appointed Director of MSIRI. The most salient features of his mandate were the initiation and implementation of projects entrusted to the institute and financed by the World Bank as part of the sugar industry restructuring plan. He paved the way for the creation of an economic unit that gained momentum and was elevated to divisional status in 1991. In addition, Dr. Ricaud had a very keen interest in information technologies and promoted amongst others the development and use of geographic information systems for research at the Institute.

Dr. Ricaud was an active member of the ISSCT since the 1970s. He held numerous positions including: Chair of the Pathology Section at the XVI Congress in 1974 in Brazil and at the XVIII Congress in 1983 in Cuba, Chair of the Standing Committee for Sugar Cane Diseases from 1977 to 1983, Editor in Chief of the Sugar Cane Pathologists' Newsletter from 1978 to 1980, Chair of the editorial committee for the revision of the ISSCT book on major diseases of sugar cane from 1977 to 1989, Councillor for Mauritius from 1985 to 1992, Vice-Chair of the Executive Committee, and Chair of the Technical Coordination Committee from 1992 to 1995.

The ISSCT established in 1924, had no permanent structure and it was decided at the XXII Congress in Colombia in 1995 to provide the organization with a Secretariat. Upon his retirement from MSIRI, Dr. Ricaud was appointed Permanent Secretary of the ISSCT, a position he held until August 2007 when he withdrew from his professional activities.

Dr. Ricaud also contributed to the advancement of the University of Mauritius by giving courses in Plant Pathology at the School of Agriculture and was a Member of the Senate from 1970 to 1975.

Dr. Ricaud's activities were not limited to research and the academic field. He was Director of the National Economic and Social Council (NESC). He played an important role in learned societies such as the *Société Agricole et Sucrière de Maurice (STASM)* and the Royal Society of Arts and Sciences of Mauritius (RSAS), organizations of which he was the President after having held various positions. He was also a Fellow of the Mauritius Academy of Science and Technology (MAST). Similarly, he became interested in the Orchid Society of Mauritius and other social organizations. Athletic by nature, he enjoyed playing football and tennis. For many years, he devoted himself daily to walking.

In recognition of his contributions to scientific research and to the advancement of various organizations, several distinctions were conferred on Dr. Ricaud during his career. He was an Honorary Professor of the University of Mauritius and a Fellow of the UK Institute of Biology. The MSIRI silver medal was awarded to him during the Silver Jubilee in 1978 and the gold medal during the Golden Jubilee in 2003. He was appointed an Honorary Life Member of the ISSCT in 2005, *Chevalier de l'Ordre du Mérite Agricole* by the French President François Mitterrand in 1990 and Commander of the Most Excellent Order of the British Empire (CBE) by Her Majesty Queen Elizabeth II in 1991. These various distinctions, and others, illustrate the remarkable journey of the renowned scientist that was Dr. Ricaud.

Dr Ricaud married Eileen Thatcher in 1961, and from this union which lasted 53 years, were born Bianca, Béatrice and Daniel. To them and their families, we express our deepest sympathy. May they find, at the heart of their

sadness, comfort in the precious legacy left to them by Dr. Ricaud: that of a devoted father, a loving grandfather and also that of a great scientist.

Jean Claude Autrey

General Secretary

In Memoriam: Dr. Derek Watt (1959 – 2026)



It is with great sadness that we have learned the demise of Dr. Derek Alexander Watt, after a short illness on 17 March 2026, at the age of sixty-six.

Derek retired as Research Manager in August 2024, after 26 years of dedicated service to the South African Sugarcane Research Institute (SASRI). During his tenure, he managed the research and development initiatives and performance of a team of 40 professional scientists, across diverse disciplines within the agronomic and biological sciences. He also liaised with departments and funding agencies of the government of the Republic of South Africa, particularly those administered by the National Research Foundation (NRF).

His contribution over that time included his role as a NRF-rated researcher and Senior Scientist in Biotechnology working on projects encompassing sucrose metabolism, sugarcane physiology, aluminium tolerance and cane deterioration. He was a committed mentor to staff, supervised nine

post-graduate students and authored/co-authored nine South African Sugar Technologists' Association (SASTA) papers, five International Society of Sugar Cane Technologists (ISSCT) publications, and 17 international journal articles. From 2006–2010, Derek also served as Manager of SASRI's Variety Improvement Programme.

His impact within the sugarcane research community was built on strong academic positions and performance in his earlier career at several South African universities. He retained honorary recognition and collaborative links with Stellenbosch University, particularly with its Institute for Plant Biotechnology, and with the University of KwaZulu-Natal (UKZN). At UKZN Westville campus, he made a remarkable contribution to the Faculty of Life Sciences, by taking on the challenge of developing protocols and curricula aimed at bridging the gap in the learning and educational abilities of first-year students. His departure to join SASRI was regarded as a significant loss to the faculty.

He served as a Member, and later Chair, of the Molecular Biology Section Committee of the Biology Commission of the ISSCT from 2007–2019 and 2019–2024 respectively, and was the South African representative on the International Consortium for Sugarcane Biotechnology.

Derek's passion and commitment to the sugar industry was instrumental in ensuring a seamless interface between research, knowledge management and extension for delivery of strategic objectives. He was a highly valued member of SASRI's Management Committee and led an important initiative to strengthen participatory research engagement between research specialists and small-scale growers.

His contributions as a scientist, mentor and manager were significant, and he executed his interactions with kindness, passion and a healthy dose of dry humour that gained him many friends in the local and global sugarcane research communities. He was known for politely, yet firmly

refuting inaccurate assertions, for being an astute and acute listener, and as an excellent judge of character.

He is survived by his wife Paula, with whom he enjoyed 18 months of retired life in Lisbon, Portugal.

Derek's leadership, scientific excellence, and dedication to the advancement of the sugarcane industry will be remembered with deep respect and gratitude.

Dr. Sandra Snyman

South African Sugarcane Research Institute (SASRI)

Sugar Cane News

One-pot process to convert sugarcane waste to jet fuel

	University of Queensland	March 27, 2026	https://news.uq.edu.au/2026-03-one-pot-process-convert-sugarcane-waste-jet-fuel
	Converting sugarcane waste to biofuel could become more environmentally friendly and cost effective, thanks to a joint project at The University of Queensland and the Indian Institute of Technology Delhi. PhD candidate Ms Neethu Joshikumar has successfully tested a process to simplify the preparation of sugarcane waste, known as bagasse. "As most countries begin the transition to sustainable fuel, the focus has turned to creating biofuels from agricultural waste but there are still challenges we need to overcome," Ms Joshikumar said. "A key problem in making biofuels from bagasse is the presence of lignin, a stubborn component that makes it harder to access the fermentable sugars in bagasse. "Conventional ethanol production involves soaking the bagasse to remove the lignin and isolate the cellulose, which requires toxic and expensive acids plus a lot of water.		

Hyosung presents bio-spandex made from sugarcane feedstock

	World Bio Market Insights	April 10, 2026	https://worldbiomarketinsights.com/hyosung-presents-bio-spandex-made-from-sugarcane-feedstock/
	Hyosung TNC, the world's largest spandex manufacturer by market share, has presented its sugarcane-based spandex line at the Functional Fabric Fair in New York. The South Korean company has committed \$1 billion to building what it calls the first fully integrated bio-based spandex production system, converting sugarcane into Bio-BDO and Bio-PTMG chemicals, then into finished Bio Spandex within a single value chain. The company's regen Bio Spandex uses sugarcane as feedstock, verified through the VIVE platform. Hyosung says the material delivers the same performance as petroleum-based spandex for activewear, sportswear, and compression applications while reducing carbon footprint.		

AI and satellite data find hidden sugarcane disease

	James Cook University	February 19, 2026	https://www.jcu.edu.au/news/releases/2026/february/ai-and-satellite-data-find-hidden-sugarcane-disease
	James Cook University researchers are developing a new tool to help farmers monitor crop health and accurately detect diseased sugarcane before it shows any visible symptoms, thereby avoiding expensive DNA analysis. A new crop health monitoring tool being developed by JCU's Professor Mostafa Rahimi Azghadi's team utilises free satellite data and AI technology to assess the health of sugarcane crops. The team's latest research, published in the journal <i>Information Processing in Agriculture</i>, describes the testing of the tool's ability to accurately determine the difference between healthy and diseased sugarcane, being the first to use satellite data to target 'asymptomatic' Ratoon Stunting Disease (RSD). "RSD can affect the yield of sugar by up to 60 per cent and it's highly contagious. But being asymptomatic, you can't see it with the naked eye until the latter stages of the growing season," Prof Azghadi said.		

Gene Editing Boosts Drought Tolerance in Sugarcane

	ISAAA Inc	February 18, 2026	https://www.isaaa.org/kc/cropbiotechupdate/article/default.asp?ID=21700
	Experts from Brazil have identified ScTpx2 as a key <i>gene</i> that plays an essential role in helping sugarcane tolerate drought conditions. The findings of the study, published in <i>GM Crops & Food</i>, suggest that enhancing ScTpx2 expression can reduce the impact of drought in sugarcane and could support the development of more resilient commercial varieties. Sugarcane is a major crop in Brazil that supports sugar and bioethanol production and contributes to lower carbon emissions. However, drought has long been the leading cause of reduced yield. In the model plant <i>Arabidopsis</i>, the research team overexpressed ScTpx2. The plants showed improved survival under severe water deficit and better performance under milder stress.		

What happened when scale met the farm reality

	Dailyhunt	April 8, 2026	https://m.dailyhunt.in/news/india/english/yourstory-epaper-yourstory/what-happened-when-scale-meet-the-farm-reality-newsid-n707670172
	For a brief period, the agritech boom across Southeast and South Asia looked like a familiar venture capital story. Between 2020 and 2022, more than \$750 million flowed into Indian agritech startups promising to digitise agriculture across emerging markets, said a report by agritech focused venture firm Omnivore.		

The pitch was straightforward: millions of smallholder farmers, large agricultural output, and rising demand would combine with technology to produce venture-scale outcomes. By 2025, that thesis had come under strain.

Funding across the region fell sharply, deal activity slowed, and several well-funded startups struggled to sustain growth. What followed has often been described as a downturn. But data suggests something more structural: a correction in how investors understand agriculture itself. Nowhere is that more evident than in South Asia.

Energy Estate and QCAR partner on sugarcane-to-fuel project [Australia]

	ESDNews	March 24, 2026	https://esdnews.com.au/energy-estate-and-qcar-partner-on-sugar-to-fuel-project/
	Energy Estate and Queensland Cane Agriculture and Renewables (QCAR) will work together to advance the BioNQ Project in North Queensland, positioning sugarcane as a critical solution to Australia's fuel security challenge. The escalating conflict in the Middle East has exposed the fragility of Australia's fuel supply chains, driving an immediate need for sovereign energy solutions. This reinforces a critical message: In an energy crisis, sugar saves.		

Syzygy Plasmonics ties up with Brazil's Geo to turn sugarcane, ethanol waste into SAF [Brazil]

	ChiniMandi	March 5, 2026	https://www.chinimandi.com/syzygy-plasmonics-ties-up-with-brazils-geo-to-turn-sugarcane-ethanol-waste-into-saf/
	US-based clean energy company Syzygy Plasmonics has signed a Memorandum of Understanding with Brazil's Geo bio gas&carbon to develop sustainable aviation fuel (SAF) projects using waste from the sugarcane and ethanol industry in Brazil, according to Biofuels International. The proposed projects will use biogas generated from sugarcane crop residues and byproducts of ethanol production. Brazil, a major producer of sugarcane and ethanol, produces large volumes of agricultural and processing waste that can be converted into fuel.		

Sugarcane crops in Costa Rica can be monitored in near real time thanks to SugarSaT [Costa Rica]

	CREAF	March 12, 2026	https://www.creat.cat/en/articles/sugarcane-crops-costa-rica-monitor-in-real-time-thanks-sugarsat
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	Earth observation through satellites is a discipline that may seem technical and distant, but it has very real applications. One of them is the monitoring of agricultural fields. In this sense, a recent study has presented SugarSaT, an innovative tool that allows monitoring the cultivation of sugar cane in Costa Rica ; for example, knowing when it is time to harvest it and detecting possible anomalies in growth. In this way, farmers can better manage labor, plan transportation or avoid economic losses due to problems that are not detected in time, such as if the plant matures earlier or later than it should, among other factors. The research has been published in the journal Smart Agricultural Technology and has been led by Bryan Alemán-Montes, a researcher at the Universitat Autònoma de Barcelona (UAB) and the University of Costa Rica, with the participation of CREA.
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Bihar considers AI technology to increase sugarcane production [India]

	Chinimandi	March 12 2026	https://www.chinimandi.com/bihar-considers-ai-technology-to-increase-sugarcane-production/
	The Bihar government is planning to introduce artificial intelligence-based technology to increase sugarcane production, with officials holding discussions with experts from Vasantdada Sugar Institute, Pune, Zee News reported. Additional Chief Secretary K. Senthil Kumar chaired a review meeting on Wednesday with representatives of the institute and other experts to discuss the use of modern technology in sugarcane cultivation. Experts at the meeting said that the use of AI-based innovations could help raise sugarcane yields by 30 to 40 percent.		

Mechanizing future: TNAU introduces patented sugarcane bud sett cutter [India]

	AgroSpectrum	February 19, 2026	https://agrospectrumindia.com/2026/02/19/mechanizing-future-tnau-introduces-patented-sugarcane-bud-sett-cutter.html
	Tamil Nadu Agricultural University has achieved a landmark in agritech innovation with the development of a sugarcane single bud sett cutter, recently awarded a 20-year patent by the Government of India's Patent Office. Designed to enhance efficiency, reduce cultivation costs, and alleviate human drudgery, the machine promises to transform sugarcane propagation practices across the nation. The cutter integrates a meticulously engineered main frame with a power transmission system, serrated cutting discs, protective safety shields, a stacker for whole cane feed, a delivery chute, vibration-reducing mounts, and four wheels for mobility. A 4-horsepower diesel engine drives the operation, with a V-belt transmitting power to a precision shaft fitted with dual serrated discs that perform the bud sett cutting. An acrylic observation panel enhances operator visibility, while a battery-powered counter tracks the number of setts processed.		

Omnicanne's path to Bonsucro certification and sugarcane circularity [Mauritius]

	Bonsucro	March 26, 2026	https://bonsucro.com/omnicane-bonsucro-certification-and-sugarcane-circularity/
	What happens when nothing in sugarcane goes to waste? That is what Omnicanne, an energy and agro-industry company based in Mauritius, has made central to its work on the cultivation of sugarcane and its derivatives. We spoke to Chitra Beekoo-Koonja, Omnicanne's Quality and Sustainability Standards Manager, to reflect on the company's journey to Bonsucro certification and explore how a long-standing commitment to sustainability has evolved into a powerful example of circularity in action.		

Nigeria launches emergency drive to curb sugarcane, tomato pests [Nigeria]

	ChiniMandi	February 14, 2026	https://www.chinimandi.com/nigeria-launches-emergency-drive-to-curb-sugarcane-tomato-pests/
	The Federal Government has launched an emergency programme to control the spread of two major pests threatening tomato and sugarcane production in Nigeria, Business Day reported. The intervention, aimed at containing the African Sugarcane Borer and Tuta absoluta, was flagged off at the Federal Crop Production Technology Transfer Station in Dan Hassan, Kano. The government described the situation as a national agricultural emergency due to the potential impact on food production.		

Agritech isn't a magic wand — but Pakistan may need one [Pakistan]

	GeoNews	March 27, 2026	https://www.geo.tv/latest/657392-agritech-isnt-a-magic-wand-but-pakistan-may-need-one
	On Mahmood Nawaz Shah's farm, in Tando Allah Yar, Sindh, two six-foot-tall poles stand quietly — one in the mango orchard, the other among the banana plants. Seemingly inanimate, these structures are busy — constantly transmitting real-time data on soil health, monitoring moisture, phosphate, and nitrogen levels to a laboratory in Karachi, through the hidden GSM sim cards, powered by small solar panels. This is just one part of Shah's tech-operated farmland. Hundreds of kilometers above the earth, satellites silently track changes in soil, temperature and vegetation across his fields. Then there are drones that offer a bird's-eye view of his 600-acre farmland where he also grows sugarcane, cabbage and cauliflower.		

KKU Collaborates with OCSB to Highlight “Bio-oil from Sugarcane Leaves” Innovation, Transforming Waste into Clean Energy to Tackle High Fuel Prices and Reduce PM 2.5 for Sustainable Agriculture [Thailand]

	Khon Kaen University	March 31, 2026	https://www.kku.ac.th/en/283244/
On 31 March 2026, Khon Kaen University, in collaboration with the Office of the Cane and Sugar Board (OCSB), organised an Upskill & Reskill training programme under the topic “Biofuel Production for Agricultural Machinery.” The initiative aimed to pilot the transformation of agricultural waste, such as sugarcane leaves and tops, into bio-oil, offering a practical solution to rising energy costs and environmental challenges.			

Latest Research

Climate exposure, institutional constraints, and transformation pathways in Fiji’s sugarcane industry

Fiji’s sugarcane industry, once the nation’s economic backbone, is at a critical crossroads, facing a multifaceted crisis that threatens its survival. Production has plummeted by over 63% from its 1996 peak, a decline driven by an aging farmer demographic, with 74% of growers over 50, rising labor costs, and antiquated milling infrastructure. This structural decay is severely compounded by intensifying climate extremes, including devastating cyclones and projections of increased heat, drought, and salinity stress that continue to suppress yields and sucrose content. Systemic vulnerabilities, rooted in land lease insecurity and youth disengagement, have locked the sector in a cycle of decline where incremental reforms are no longer viable. This perspective paper advances a strategic blueprint for radical transformation, calling for a decisive pivot from low-margin commodity dependence toward a climate-resilient, technology-enabled, and diversified agricultural system. Core interventions include the modernization of mills and on-farm mechanization, systemic land tenure reforms to secure investment, and the adoption of climate-smart cultivation practices to empower farmers. The fate of Fiji’s sugar industry is an economic imperative and a test of political will; without these evidence-driven actions, its collapse is imminent, but with them, Fiji can transform a struggling relic into a sustainable engine for rural development.

Published April 13, 2026

> [Link](#)



An explainable deep learning framework for few shot crop disease detection in rice and sugarcane using CNN based feature extraction

scientific reports

Where crop health is essential to global food security. Our focus is on early crop disease detection in the field of agriculture, especially Rice and Sugar cane leaf disease. This prompts researchers to consider quick, automated, cost-effective, precise, and efficient methods of identifying the kinds of diseases utilizing contemporary technologies like image processing, artificial intelligence (AI), and Explainable Artificial Intelligence (XAI). This paper proposes an framework to detect pest infestation for rice and Sugar cane cultivation and suggests an effective framework for rice and Sugar cane disease detection and forecasting that uses image processing to standard, resizing, and normalization rice and Sugar cane images then, using feature extractor using CNN after that we using few-shot learning (FSL) techniques such as like Prototypical Networks and Model-Agnostic Meta-Learning (MAML) learning techniques for superior decision-making in smart farming systems. The experimental findings demonstrated the Accuracy and specificity of the suggested framework in identifying and effectively predicting the kind of disease. According to the results, the suggested framework outperformed the state-of-the-art benchmark algorithms in disease prediction while producing results that were plausible. With Prototypical Networks and MAML for rice leaf disease datasets, it increased by up to 97.6% and 95.27%, respectively. For effective rice disease identification, Prototypical Networks and MAML for Sugar cane leaf disease datasets increased by up to 91.68% and 90.27%, respectively. Interpretable AI-driven insights were further made possible by the combination of proposed system with Grad-CAM Explanation, which improved decision-making transparency.

Published March 5, 2025

> [Link](#)

Multiple AMMI models investigation to decipher the genotype by environment (G×E) interaction in sugarcane interspecific hybrids for yield and quality traits

scientific reports

Genotype × Environment interaction for yield and quality traits was studied in 19 sugarcane (*Saccharum spp.*) genotypes, including 16 test entries and three varieties, assessed using a Randomized Block Design with three replications at Ponni Sugars, Erode, during 2023–24 and 2024–25 as first plant, second plant and ratoon crops. Combined ANOVA revealed significant genotype and environmental effects, with notable $G \times E$ interactions for Single Cane Weight (SCW), Cane Yield (CY), Number of Millable canes (NMC), Cane length (CL), and Commercial cane sugar yield (CCSY). CY had significant positive association with NMC ($r = 0.49^{**}$), CCSY ($r = 0.89^{**}$) and CL ($r = 0.31^{*}$). Among different AMMI models, R-AMMI-LM model provided better data analysis, showing lower residuals and RMSE, with yielding higher variance explanation for traits under study. Biplot analysis revealed that Co 15002, Co 19002, Co 15017, and Co 20010 were stable for cane yield, while Co 20010, Co 20005, and Co 21004 were identified for CCS yield stability at 360 days. The stability parameters, MASI, MASV and

SIPC values revealed genotypes Co 15020, Co 19002, Co 15017 and Co 20010 with highest stability for cane yield whereas Co 20010, Co 20005, Co 21004 and Co 15020 were recognized as stable for CCSY. Considering stability and yield for each trait, SSI identified Co 15017, Co 14012, and Co 15020 for higher cane yield with stability and Co 20010, Co 86032, and Co 15017 for higher CCS yield with stability. Co 11015, Co 15020, Co 20009, Co 20011, and Co 21007 are highly stable with higher mean value for sucrose % and CCS % at 300 days and identified as early maturing group. Multiple analysis revealed clones, Co 15017 and Co 14012 are as highly stable with good cane and CCS yields and found comparable to local standard, Co 86032 for 12th month cultivation.

Published: February 16, 2026

> [Link](#)

Biochar and hydrochar from agro wastes: technological pathways, characteristics, and advances in soil amendment

The increasing generation of agro waste presents major environmental and management challenges, driven by improper disposal practices that contribute to soil degradation, pollution, and greenhouse gas emissions. Among available waste valorization pathways, thermochemical and hydrothermal conversion technologies enable the production of biochar and hydrochar with significant potential for soil amendment and carbon sequestration. This review focuses on the production and application of biochar and hydrochar derived from agro waste for soil amendment. The characteristics of agro waste are discussed in relation to their suitability for thermochemical and hydrothermal conversion; the physicochemical properties of biochar and hydrochar are discussed with respect to surface chemistry, stability, nutrient retention, and environmental performance. Recent advances in soil application are reviewed, highlighting effects on soil physicochemical properties, microbial biomass, crop productivity, pollutant immobilization, and carbon sequestration. Overall, biochar generally exhibits superior stability, surface area, and soil amendment performance compared to hydrochar; however, it is not suitable for all biomasses, particularly wet residues or sludges. In contrast, hydrochar can be effectively upgraded through post-treatments such as washing or secondary pyrolysis, enabling competitive soil amendment performance. Challenges for both chars include feedstock heterogeneity, scalability, long-term environmental impacts, and standardization for carbon accounting. Addressing these issues is critical to align agro waste-derived biochar and hydrochar with climate mitigation and net-zero targets.

Published March 27, 2026

> [Link](#)

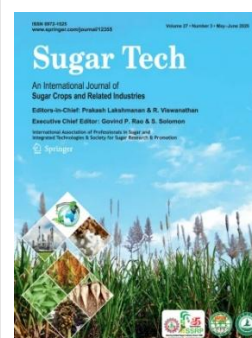
Frontiers in Environmental Science

The Multi-trait Selection for Higher Cane Yield and Sugar Quality-Related Traits in Sugarcane (*Saccharum* spp.)

Efficient multi-trait selection across cropping cycles is essential for accelerating the genetic gain in the sugarcane breeding pipeline. However, limited studies have integrated REML/BLUP-based genetic parameters, and the multi-trait genotype ideotype distance index (MGIDI) approaches in sugarcane breeding for identification of candidate clones in terms of cane and sugar yield trait combination under diversified cropping cycles. The present study evaluated 28 sugarcane clones across three cropping cycles: Plant Crop I (2022–2023), Plant Crop II (2023–2024), and Ratoon (2023–2024) at RARS, Anakapalle, to identify high-yielding and stable clones. Except for cane length, all yield and sugar quality traits exhibited significant genetic variation and genotype $\times$ season interaction at the $p \leq 0.05$ level. The REML/BLUP analysis revealed moderate heritability and high selection accuracy for CCS yield, identifying it as the most reliable trait for direct genetic improvement in sugarcane breeding. Principal component analysis explained 84.4% of the total variation and effectively grouped the cane yield and sugar quality traits. All agronomic traits were significantly and positively correlated with cane yield, while sugar quality traits showed non-significant associations. Path analysis indicated a strong relationship between cane yield and CCS yield ($R^2 = 0.796$), although multicollinearity was observed among sucrose %, brix %, and CCS %. MGIDI-based selection resulted in 84.41% cumulative genetic gain and identified clones 2018A 6, 2018A 157, 2019A 156, and 2019A 160 as closest to the ideotype ($\geq 105 \text{ t ha}^{-1}$ cane yield and $\geq 14 \text{ t ha}^{-1}$ CCS yield). Factor analysis grouped the eight traits into three factors: FA1 (sugar quality traits and cane length), FA2 (CCS yield and NMC), and FA3 (cane yield and girth). Overall, the integration of REML/BLUP, multivariate analysis, and MGIDI across multiple cropping cycles provides a robust framework for identifying high-yielding, stable, and broadly adaptable sugarcane clones.

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> [Link](#)



From sugar industry by-product to resource: Utilizing retentate concentrate of sugarcane juice for novel plant growth promoter development

Ceramic membrane clarification technology is a novel physical clarification process for sugar production. The Retentate Concentrate of Sugarcane juice (RCS) contains substances difficult to clarify through conventional methods, limiting resource utilization and technology industrialization. The rich nutrients in RCS make it worthy of resource utilization, particularly suitable as a microbial culture medium. This study investigated the use of RCS as a substrate for developing plant growth-promoting microbial formulations, thereby addressing its resource utilization challenges. The dynamic changes in RCS microbial community composition during 60



days of storage were monitored using high-throughput amplicon sequencing. Eight selected *Bacillaceae* strains with PGP potential were included, including phosphate solubilization, nitrogen fixation, indole-3-acetic acid (IAA) production, extracellular enzyme secretion, osmotic stress tolerance and no antagonism. Mixed strains were used to prepare the RCS agent with increased colony count ($8.57 \log_{10}$ CFU mL⁻¹), sporulation rate (2.33%), and maintained enzyme activity using $10 \times$ diluted RCS medium. *Brassica chinensis* L. (Pakchoi) potting experiments confirmed RCS agent significantly improved its growth quality (plant height +17.35%, fresh weight +38.00%, chlorophyll *a* +35.66%) and enhanced rhizosphere soil nutrients (NH_4^+ +17.21%, available phosphorus +4.62%, NO_3^- +12.45%) compared to controls. These results demonstrate a novel strategy for the value-added utilization of RCS by converting it into an effective plant growth-promoting microbial formulation.

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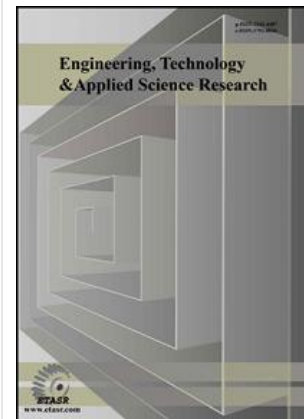
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A Sugarcane Height Estimation Model Based on Multi-Source Satellite Data Fusion Using Machine Learning

The combination of satellite and Machine Learning (ML) approaches is emerging as a new paradigm in crop height estimation, facilitating informed decision-making. This study aims to identify key factors influencing sugarcane height prediction and compare the performance of single satellite data with data fusion. The proposed height estimation model was designed with the help of satellite data from Sentinel-2 and Landsat 9. A data fusion technique was used to extract vegetation, morphological, and meteorological indicators from three land plots in 2023 and 2024. The collected data were preprocessed using the Interquartile Range (IQR). Forward chaining was utilized to split data into training and testing subsets (40:20, 50:20, 60:20, 70:20, and 80:20). Feature importance analysis was performed to identify features contributing to sugarcane height prediction. The selected features were used as inputs for three ML models: Random Forest (RF), Extreme Gradient Boosting (XGB), and Support Vector Regression (SVR). The results of sugarcane height estimation indicate that the use of multi-source data fusion (vegetation indicators, morphology, and meteorology) with XGB achieved the best and most robust performance, with a coefficient of determination (R^2) of 0.997, a Root Mean Square Error (RMSE) of 6.254 cm, and a Mean Absolute Percentage Error (MAPE) of 3.097%. The findings demonstrate a strong potential of real-time remote sensing-based height estimation for sugarcane, supporting precise monitoring and data-driven decision-making.

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> [Link](#)



Spray Drones: A New Technology for Crop Protection Applications in Brazil

The advancement of digital and automation technologies has driven the adoption of Unmanned Aerial Vehicles (UAVs) in agriculture, particularly in crop protection product spraying. This study aimed to conduct a systematic review of national and international literature on the use of spray UAVs in Brazilian and world crops, identifying their applications, limitations, and future perspectives. To this end, the databases Scopus, Web of Science, SciELO, and Google Scholar were searched for the period between 2014 and 2025 using strategic combinations of descriptors related to UAVs, agricultural spraying, regulation, and precision agriculture. The results indicated that UAVs have been employed in different crops, including soybean, maize, coffee, sugarcane, rice, cotton, citrus, wheat, and common bean, showing improvements in droplet deposition, access to difficult-to-manage areas, and reduced human exposure to crop protection products. It is concluded that spray UAVs represent a promising tool for precision agriculture in Brazil, with the potential to transform crop management practices and promote greater sustainability in the sector. This study makes a novel contribution by integrating national and international evidence on spray UAVs, highlighting research gaps and supporting scientific and technological advances in Brazilian agriculture.

Published April 2026

> [Link](#)

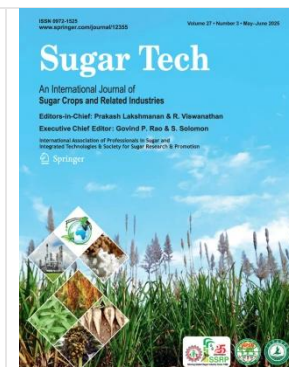


Spatial Modeling of Sugarcane Yield Using Machine Learning Approaches

Sustainable precision agriculture and artificial intelligence (AI) are transforming modern farming by enhancing resource efficiency, addressing climate challenges, and fostering sustainability. In Colombia, sugarcane cultivation is pivotal in the agricultural economy, particularly in the Cauca River Valley, a region grappling with climate variability and resource optimization challenges. This study introduces an innovative methodology that combines machine learning (ML) techniques with geospatial data to predict sugarcane yields accurately. The research employs the CatBoost, random forest, and XGBoost ML algorithms, integrating historical data on climate, soil characteristics, and agricultural management practices to develop spatially detailed predictive models. The findings demonstrate that ML-based approaches outperform traditional methods like linear and penalized regressions, offering more precise agricultural planning and resource management predictions. Focused on the municipality of La Candelaria, this work underscores the potential of ML technologies to enhance productivity while promoting sustainable agriculture.

Published March 26, 2026

> [Link](#)



Events

	SIT Annual Technical Meeting 2026 <i>Sugar Industry Technologists (SIT)</i> 19–22 April 2026 Cincinnati, Ohio, USA > Link
	Annual Conference of the Australian Society of Sugar Cane Technologists (ASSCT) <i>Australian Society of Sugar Cane Technologists (ASSCT)</i> 21–24 April 2026 Mackay, Australia > Link
	Pathology Section Webinar: Emerging Diseases of Sugar Cane <i>ISSCT Pathology Section</i> 2 June 2026, 11am – 1pm GMT Online > Link

	Molecular Biology Webinar: Molecular and Biotechnology Approaches Shaping the Future of Sugarcane <i>ISSCT</i> 25 June 2026 Online > Link (more information to be included when available)
	American Society of Sugar Cane Technologists (ASSCT) – Annual Joint Meeting <i>American Society of Sugar Cane Technologists (ASSCT)</i> 17–19 June 2026 Sheraton New Orleans New Orleans, USA > Link
	Agrotech Colombia <i>Technicaña</i> 1–3 July 2026 Cali, Colombia > Link
	13th Latin America Congress <i>ATALAC – Association of Sugar Technicians of Latin America and the Caribbean & STAB – Society of Sugar and Alcohol Technicians of Brazil</i> 10–14 August 2026 Ribeirão Preto, SP, Brazil > Link

	Fenasucro & Agrocana 2026 <i>American Society of Sugar Cane Technologists (ASSCT)</i> 11-14 August 2026 Sertãozinho – SP, Brazil > Link
	SASTA Congress <i>South African Sugar Technologists' Association</i> 18-21 August 2026 Durban, South Africa > Link
	Thailand Sugar Conference 2026 <i>Fireworks Exhibitions</i> 10-11 September 2026 Khonkaen International Convention & Exhibition Center, Thailand > Link
	Germplasm & Breeding/Molecular Biology Workshop – Developing Climate Resilient Sugarcane <i>ISSCT Biology Commission</i> 9-13 November 2026 Barbados > Link

	35th International Sugar Organization Seminar <i>ISO</i> 1-2 December 2026 Church House, Westminster, UK > Link
	Pathology & Entomology Workshop – Pushing the frontiers of agroecological management strategies of sugarcane pests and diseases <i>ISSCT Biology Commission</i> March 2027 Réunion Island > Link (more information to be included when available)
	Agricultural Engineering & Agronomy Workshop <i>ISSCT Agricultural Commission</i> 12-15 April 2027 L'Auberge Casino & Hotel Baton Rouge LA, USA > Link (more information to be included when available) (more information to included when available)
	Co-Products Workshop <i>ISSCT Co-Products Commission</i> 16-19 August 2027 Khon Kaen, Thailand > Link (more information to be included when available)

	Engineering & Processing Workshop <i>ISSCT Factory Commission</i> 2027 Australia > Link (more information to be included when available)
	Management Workshop <i>ISSCT Management Commission</i> January/February 2028 (during Congress) Guatemala > Link (more information to be included when available)
	XXXIII ISSCT Congress 2028 <i>ISSCT & Asociación de Técnicos de Azucareros de Guatemala (ATAGUA)</i> January/February 2028 Comité Permanente de Exposiciones, COPEREX, 8a calle 2-33 zona 9, Ciudad de Guatemala, Guatemala City > Link

