September 2021

International Society of Sugar Cane Technologists
Founded 1924

Bulletin

Welcome to the ISSCT Bulletin for September 2021. It includes a special section on the impact of Covid-19 on various sugar cane industries across the world, as well as some latest news, research, along with past and upcoming events related to sugar cane technology.

Covid-19 Impact on Sugar Cane Industries 2

Argentina 3
Australia 6
Brazil 7
China 9
Colombia 10
Ecuador 11
Guatemala 14
India 15
Indonesia 17
Mauritius 21
Mexico 24
Pakistan 25
Réunion 26
South Africa 27
Thailand 28

Sugar Cane News 30

Sugar Rallies as Brazil Cane Fields Scorch, Ethanol Price Soars 30
Sustainable sugar: Bonsucro unveils digital tool to map and assess supply chains 30
Sugar cane farmers in Punjab end stir after hike in SAP announced [India] 30
Louisiana Sugar Cane Festival and Farm Fest canceled for fall 2021 31
Sugar growers sue US over Florida reservoir water levels 31
Morrisons to begin selling Bottle Up's sugar-cane water bottles 31
Commission of Agricultural Cost and Price wants sugarcane farmers' dues to be paid in instalments [India] 32
Brazil hopes the world will get a taste for its favourite spirit 32

Latest Research 36

New Solvent Mixtures Could Simplify Production of Biofuels like Bioethanol 36
Development of new enzymes and microbial cells for the enhancement of livestock feeds based on sugarcane fibre 37
Alkaline pretreatment and response surface methodology based recombinant enzymatic saccharification and fermentation of sugarcane tops 38
Factors influencing Australian sugarcane irrigators' adoption of solar photovoltaic systems for water pumping 38
Conservation Agriculture for Enhancing Productivity, Resource Use Efficiency & Environmental Quality of Sugarcane Cropping System 39
Energy-carbon-water footprint of sugarcane bioenergy: A district-level life cycle assessment in the state of Maharashtra, India 39

Events 40

Thailand Sugar Conference / SUGAREX Thailand 2021 40
Sugar Summit 40
79th STAI Annual Convention and International Sugar Expo 2021 40
28ª Feira Internacional da Bioenergia 41
30th ISO International Seminar 41
4th Agricultural Engineering, Agronomy and Extension Workshop [postponed] 41

'A complete failure of the state': Authorities didn't heed researchers' calls to study health effects of burning sugar cane [USA] 32
'A perfect storm': UK beet growers fear Brexit threatens their future 33
One sugar refinery plans weekend restart after Ida 33
Belizean farmers diversifying from sugar cane, onion production; receive training on carrot production 34
Hurricane Ida's impact on Louisiana agriculture hit timber and sugarcane; see video of damage 34
Cane growers bitter at proposal to double the sugar tax [South Africa] 34
Gro Model Predicts Sucrose Decline in Brazil Sugarcane 35
Zimbabwe: High Dam Levels to Drive Sugarcane Output 35
Prices of sugarcane have fallen by 80 per cent in last four years [Uganda] 35
'Modern tech' is panacea for country's sugar output deficiency [Bangladesh] 36
Sugar & Ethanol Asia 41
11th Annual Africa Sugar Conference 41
ISSCT XIII Pathology Workshop [postponed] 42

Covid-19 Impact on Sugar Cane Industries

The Covid-19 pandemic has affected the sugar cane industry across the world, including production and research and development at various levels. The ISSCT Secretariat requested updates from sugar cane-producing countries, which are featured below in this special edition of the ISSCT Bulletin.

The involvement of the industry in providing assistance in various forms to its surrounding communities in their fight against the virus has been highlighted.

Argentina



1. Overview of National Vaccination Campaign

As of 20 July, 38,225,353 vaccinations have been given; 27,020,987 of them were first or unique doses and 11,204,366 were second doses. This represents 84% of the population having the first or unique dose and almost 25% for the first and second doses. Most of the sugar mills keep and update records of the incidence of Covid-19 disease, as well as the vaccination of their personnel.

2. Industry - Preventive and Control Actions Against Covid-19

All mills, refineries and R&D centres dedicated to sugar cane in Argentina developed and implemented prevention protocols, in some cases with internal audits to control effective compliance.

At the entrance gates, all people have their body temperature monitored, and in some of them, third parties (clients, suppliers, contractors, etc.) are requested, as an entry requirement, to show a copy of their vaccination certificates.

In north-west Argentina, the sugar and alcohol industry was the main supplier of the hydroalcoholic solution (70% ethyl alcohol + 30% deionized water) used by public health entities, institutions, companies and the general population. As an example, the Cía. Azucarera Los Balcanes S.A., from Tucumán, donated 336,000 litres, and sold 1,500,000 litres of this solution.

Similar measures and actions were also taken by other important leading companies in the sector, such as Ledesma SAAI.



3. Social Behaviour Regarding the Vaccination Programme

Vaccination has been well received by the majority of the people in north-western Argentina; albeit with small pockets of resistance at both ends of the socioeconomic pyramid. Some with good education and financial security have been reluctant to embrace vaccines considered experimental or of doubtful origin and quality -as is the case of Russian Sputnik V vaccine, the most applied in Argentina. Some at the lower end have shown superstition and excessive fear, often with poor access to information.

4. **Effects on Production and on Public Health**

The 2021 harvest season is progressing as normal, as did the 2020 season. Both cane and sugar yields were not affected by the low incidence of Covid-19.

The main negative effect on people has been an increased workload for healthy, vaccinated or recovered personnel, due to the necessity of covering the shortage of personnel caused by the disease. This has been especially marked in those field and factory jobs that require a physical presence and some specialization or previous experience.

In general, the activities of planting, cultivating, harvesting, transporting and processing crops whose products are industrialized (as is the case of sugar cane, lemon, oranges, avocados, strawberries and blueberries, among others) sustained the regional economy and the employment in the provinces of Argentina where these activities are carried out. This has increased their relative contribution to regional Gross Domestic Product during 2020 and so far in 2021.

5. Effects on RD&E Programmes

The activities of the sugar cane research centres were carried out in both face-to-face and remote modes, depending on their characteristics.

Management of field trials had to be done in person, taking all the necessary measures to avoid the spread of the virus. However, due to the restrictions imposed, field work has experienced some delays and/or limitations.

Everything that could be done remotely, such as analysis of results, consultations, meetings, national and international seminars, reports, publications, etc., was done remotely.

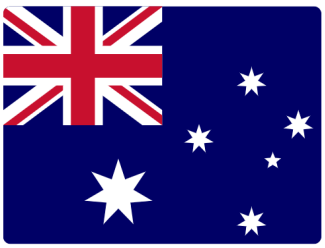
The most affected services were extension advice to sugar cane producers, especially to small-scale growers that use these services rather than private advisors. Overall, programmed activities were generally fulfilled, with some different limitations according to each section.

Regarding vaccination, its rate of progress is perceived as satisfactory, as well as its acceptance by the personnel of those centres. Since vaccination is not compulsory in Argentina, the RD&E institutions did not establish restrictions on the entry of

dependent personnel to their workplaces, except in the event of detection of fever or physical discomfort.

Juan Carlos Mirande

Australia



In Australia, the crushing season is making steady progress despite the pandemic. Most factories are about one third through crushing the expected 31.4 Mt crop, with progress roughly similar to pre-Covid years. Some factories purposefully started early because of Covid, and others were delayed because of hold-ups in obtaining essential factory equipment.

About 90% of the sugar production in Australia occurs within the state of Queensland with the remainder produced in the state of New South Wales. At the time of writing, the state of Queensland has been less affected by the pandemic than others. This has allowed a degree of normalcy to occur in the main sugar producing regions.

The State Government of Queensland adopted a strict policy of lockdowns based on medical advice. The lockdowns are imposed "hard and fast", leading to major inconveniences for all concerned. In a recent example, a lockdown was imposed with a five hours' notice period to the Greater Brisbane area and to the Cairns area, following detection of an incursion of the delta virus. This made life difficult since it was undertaken late on a Saturday morning, but the outcomes have been good. Unfortunately, at time of writing, the state of New South Wales has a severe outbreak of the Delta strain. This outbreak has mainly affected Sydney and environs but is now spreading to rural and regional areas of the state of New South Wales. Strict lockdowns have now been implemented in that state and there is only essential movement across the border into Queensland.

The results for the Australian sugar industry in the 2021 season have been steady to date and should be good going forward, provided there are no major incidents. Regarding Research & Development, the pandemic has had a major impact because travel is highly restricted. Despite this, some R&D is progressing, albeit at a

much slower pace. However, the recent budget-related downsizing in Sugar Research Australia is likely to impact in the future.

Although the Australian sugar industry has been spared some of the major economic consequences of the pandemic, other sectors in Australia have been severely affected, notably tourism, education, small business operations and the performing arts. Lockdowns, the inability to travel and to socialise during the pandemic affect is not good for the human psyche; the effects of which will only been seen in the months and years to come.

As of 20 August, about 40% of the population had received at least one dose of Pfizer or AstraZeneca vaccination, with 23.3% receiving two doses. Vaccination rates are increasing with increased supply and increased government emphasis on getting vaccinated.

Peter Allsopp and Bryan Lavarack

Brazil



In Brazil, the sugar-energy sector has not ceased its activities during the pandemic thanks to strict safety and health protocols that allowed operations to continue. A series of initiatives were carried out to ensure the physical and psychological integrity of the employees. In addition, during the last few months, the sector has been offering the Brazilian population sugar, ethanol, bioelectricity and alcohol for sterilisation.

In a show of cooperation and solidarity, the sugar-energy sector united to help fight Covid-19. The campaign, called "É por Todos", manufactured 70% alcohol and donated this to the public health network for use in hospitals. The Sugar cane Industry Union (UNICA), through its sugar mill members, donated 332,000 litres of 70% alcohol for use during the national elections in 2020. In the first half of 2020, UNICA member companies donated 1 ML of 70% alcohol to be used for disinfection in the public health system in nine states, including São Paulo and Rio de Janeiro. In addition to donating alcohol, some sugar mills donated hospital beds, diesel fuel to maintain hospital generators and financial resources for the construction of temporary hospitals.

In addition, through this "É por Todos" campaign, a sanitary protocol was developed to maintain the health of those who need to remain on the front lines at the sugar mills. Employee awareness of the main coronavirus prevention measures was enhanced, and work routines reorganized (home office layout; cafeterias with numbers limited and distancing of tables to avoid crowding, etc). The sixth version can be found here. Some sugar mills have implemented a Covid-19 Support and Prevention Program (PAP Covid-19). The goal of PAP Covid-19 is to help with the mental health of employees and their families, as the pandemic can have major emotional impacts. The PAP Covid-19 is available 24 hours a day, every day of the week. Contact is made by telephone, free of charge, by a team of social workers and psychologists, maintaining total confidentiality.

The sugar-energy sector was concerned at the beginning of the harvest, in April, when the pandemic was showing its full force. In addition to the concern for the health of employees, there was also the social isolation of people, which led to a drop in ethanol consumption in fuel. However, at the end of the 2020/2021 harvest, the initial fear turned into good results; 610 Mt of sugar cane were produced in Brazil from a harvested area of 8.6 Mha (an increase in production of 3.5% compared to the previous crop). Sugar production rose to 41.8 Mt and ethanol production was 32,900 ML. The Total Recoverable Sugar Index (ATR) rose to 142.9 kg/t, caused, in part, by the lower rainfall in the Center-South region. The harvest turned out to be positive in all aspects, from the result of sugar and ethanol production, as well as through the generation of energy and the sale of CBios (decarbonization credit certificates issued by ethanol producers). Ethanol, the most worrying for the sector, due to the national reduction in transport, ended up not being a problem. Only 16% of the sugar cane produced had to be used for the production of fuel. With the remaining 84%, producers could choose between ethanol and sugar; those who opted for sugar returned a profit 22% higher than that of ethanol.

Monalisa Carneiro

China



Sugar cane is grown in the southern parts of China on 1.1 million hectares. The overall mechanization rate is about 50%, but almost 70% of planting is done manually. Crops are harvested from mid-November to April, and 95% of sugar cane is harvested manually. The average millable cane and sugar yields in 2019 were 60 and 8.3 t/ha, respectively.

It is very pleasing to report that Covid-19 has had very minimal impact on public life in China for most of 2020. Indeed, the day-to-day life in most places in China has returned to almost pre-Covid stage with little restriction on domestic travel. The rapid control of Covid-19 in the initial stage of the pandemic helped Chinese industrial, agricultural and economic activities bounce back quickly to normal levels. This was reflected in the sugar cane industry performance as well. The area cultivated did not shrink, and average cane and sugar yields were comparable to previous years.

The 2020 cane harvest, transport and milling were, however, delayed slightly. The cost of harvesting also increased. Sugar cane planting and harvesting in China are heavily dependent on the availability of foreign worker from the neighbouring countries of Vietnam, Myanmar and Laos. Cross-border movement between China and the neighbouring countries was highly regulated in 2020 harvest season, causing delay and shortage of labour supply for cane harvest.

Crushing in sugar mills is back to normal in the 2021 season, as is new planting. The sugar cane industry workforce is not much affected by Covid-19. Sugar cane-related organisations, except universities, are functioning normally, as in the pre-Covid period; some Chinese universities still have some restrictions on entry. While the highly successful Covid infection control in China remains a model for other countries, in the last three weeks the Delta strain raised its head simultaneously in several locations across China, including in some cane-growing regions. However, with strict control measures, its spread is contained at this stage.

Prakash Lakshmanan

Colombia



Up until August 16, in Colombia, 31,963,634 doses of vaccine have been applied, with 18,160,779 people treated with one dose and 11,147,003 with a second dose. Additionally, 2,655,852 single-dose vaccines have been applied.

To accelerate the immunization process of Colombians against Covid-19, the Pichichi, Mayagüez, Sancarlos, Carmelita, Risaralda, Del Occidente, Incauca and Providencia sugar mills, as well as Cenicaña, acquired 34,284 doses of vaccine to inoculate 17,142 of his employees and collaborators. Additionally, the Manuelita, La Cabaña, Maria Luisa and Riopaila Castilla sugar mills are supporting the mayors of their municipalities with logistics in the vaccination of collaborators and family members as part of the national plan.

Through the mills affiliated to Asocaña: Carmelita, Incauca, La Cabaña, Manuelita, Maria Luisa, Mayagüez, Occidente, Pichichi, Providencia, Riopaila Castilla, Risaralda and San Carlos, the sugarcane agroindustrial sector has been donated ethanol to produce pharmaceutical alcohol for hospitals. The alcohol donations amount to 395,000 L and were sent to the departments of Valle, Chocó, Cauca, Cundinamarca, Meta, Nariño, Risaralda, Caldas, and Quindío. The first donation was 250,000 L ethanol for the departments of Valle del Cauca, Cauca, Cundinamarca, and the coffee region (Risaralda, Caldas, and Quindío). This was delivered to the governments of each department, who, with the support from the liquor companies in each region, oversaw its processing and distribution to hospitals. Finally, through Asocaña, the mills donated more than 1000 tons of sugar through the food bank in 22 departments of the country. Cenicaña and Asocaña also delivered to the Valle del Cauca Government an ultra-freezer for the storage of Covid-19 vaccines.

Impact on the sugar cane agroindustrial sector

There has been a 1.7% reduction in the internal consumption of sugar associated with lower use in hotels, bars, and restaurants. However, the export of sugar increased by 6.9%. In addition, ethanol consumption decreased by 21% due to the lower demand for gasoline-alcohol (Source: Annual Report 2020-2021 Agroindustrial Sugarcane Sector).

Socio-economic effects of Covid 19 one year after the pandemic

Throughout the country, there was lower production in some economic sectors, a reduction in private consumption and the loss of jobs. The most affected economic sectors are artistic activities (-37%), commerce (-34%) and construction (-33%). This has led to the loss of nearly 1.5 million jobs. However, there has been a recovery in the indicators since the end of 2020; the unemployment rate in June 2021 was 14.9%, 5.4 percentage points lower than in the same month in 2020.

Nicolás Javier Gil Zapata and Fernando Muñoz Arboleda

Ecuador

Household food security



The situation on food availability during the pandemic is summarized on a study conducted by RIMISP (https://www.rimisp.org/impactos-del-covid-19). The survey focused on the impacts of the pandemic on households in several communities in Ecuador. The survey was based on interviews with a sample of heads of household women. Vulnerability and impoverishment were identified, both in urban and rural areas, due to the pandemic and the measures taken to curb contagion. Within household lead by women, the poorest groups in both urban and rural areas were more affected by the pandemic. The greater loss of income, partial and total, was found in Guayas. There was moderate to severe food insecurity in all the other assessed areas.

In general, it is observed that the poorest households are located in urban areas and therefore the most affected by the pandemic. They report lower incomes and changes in diet with greater frequency. This translates into lower consumption of fruits, vegetables, meat or fish. This is not the case in rural areas, where the data suggests that the consumption of basic food products did not decrease, and a rather small percentage of production increased. The capacity to access food has been greater in rural areas when compared to cities. The pandemic showed that it is essential to have roads and channels of access to supermarkets and shops in the cities to move production to and from rural areas in order to avoid

shortages that have been observed in cities. There was also a 37% increase in the purchase of food at the local farmers market, and a decrease in purchases in urban markets and supermarkets.

The impact of Covid-19 on the Ecuadorian economy

A report from Ekosnegocios (https://www.ekosnegocios.com), shows that after the state of emergency declared on March 16, 2020 to address the Covid-19 health crisis, the effects on the economy and employment were extreme. Taking into consideration that Ecuador was already at the beginning of a period of economic recession in 2019, with a GDP growth rate of 0.1%, these effects surpassed expectations. According to the Central Bank of Ecuador (BCE), the economy contracted by 8.9% of GDP in 2020, with a general recession in most of its economic sectors and an expectation of a 3.1% recovery growth of GDP by 2021. However, this is not enough to recover the losses generated during the first year of the pandemic. The International Monetary Fund (IMF) estimates a deeper contraction of the Ecuadorian economy of -11% of GDP by as of 2020. It is expected that the recovery of overall country GDP to pre-pandemic levels will not take place until 2023, while the per capita GDP recovery might not be until 2025.

According to the Ministry of Public Health (MSP), as of August 10, 2021 there have been 492,000 people infected with Covid-19 and around 31,788 deaths. This implies an additional impact to the economy due to an irrecoverable loss attributed to premature deaths. This impact is estimated to be of about 2.6% of GDP, and the immeasurable aftermath of the disintegration of the families, which, according to human capital theories, has an impact on the future capacity to educate, be employed and generate new resources. Therefore, every household affected by a premature death (particularly the loss of heads of household and household members between the ages of 20 and 65) will carry consequences that will have a subsequent effect on the economy.

According to the BCE, the sector that will maintain a greater momentum during 2021 corresponds to aquaculture and fisheries; with the shrimp sector having the highest growth (8.3%). This sector is followed by the Hotel and Food Services sector (7.5% growth in its sectoral GDP). Agriculture, Forestry, Financial Services and Insurance are the sectors that can recover their economic activity more quickly. Despite having made efforts to balance the economy, Ecuador still needs

to rebalance its public finances to avoid an unsustainable debt increase while strengthening confidence in macroeconomic stability and the dollarization.

Impacts on Ecuador's sugar sector

In the 2021 harvesting season, the sugar industry plans to process 550,000 T of sugar. After a year of lockdown, the sector is not only challenged to recover from low sales, but also meet market conditions while avoiding losses in its profitability and sustainability. The first imbalance is due to lower consumption. Lower purchasing power generated by the tax on sugary refreshments and the changes in habits of people, who are looking for new sweetener alternatives, have caused a significant drop in demand. According to FENAZUCAR (the Ecuadorian industry association), three years ago the per capita consumption of white sugar was at 32 kg. That indicator last year plummeted to 3.4 kg. This is worsened by the fall of international prices, which have fallen by 25% in the last few years.
Another challenge for the industry is the recovery of production costs, especially the value of the raw material that, despite everything, continues to rise year by year. The sugar mills have contracts with cane providers that they must fulfill. Therefore, if the market contracts, sugar mills cannot stop buying cane. Alternatively, if these imbalances are kept, the mills would have to reduce the harvest areas.

Despite all these problems, Ecuador's sugar industry is resilient and continues to operate normally. It has not laid off essential workers during the pandemic, it has contributed with sugar and alcohol donations to the urban poor, especially in communities near the sugar mills. In 2020, 77,182 ha were harvested, with a production of 523,837 T of sugar. International sugar price forecasts are good and an increase in local consumption in the beverage and confectionery industries is expected.

Although Covid-19 severely affected in the economy, the sugarcane industry is still supporting scientific research, especially in the development of local varieties adapted to the sui-generis conditions of the Ecuadorian coast land with low net sunshine and thermal oscillation. Currently, the sugar mills have 53% of the area cultivated with varieties from the Sugarcane Research Center (CINCAE), Valdez mill being the main user of local varieties (81% of its harvested area).

Raúl O. Castillo

Guatemala

Guatemala general data on Covid-19



Guatemala has seen over 450,000 cases of Covid-19 since the start of the pandemic. Most have recovered, by there have been 11,694 deaths due to the virus. Currently, there are about 53,000 active cases in the country.

Over 4 million people (25% of the population) have been given at least one dose of vaccine, with almost 1 million having two doses.

Guatemala Sugarcane Agroindustry

Very good protocols for the control of Covid-19 were implemented in all the sugar mills of the Guatemalan sugar cane industry, impacting all employees.

All the sugar mills completed the harvests in 2019/2020 and 2020/2021 successfully.

At the Guatemalan Sugarcane Research and Training Center, CENGICAÑA (Research & Development Program) we have similarly implemented all the protocols and we have had relatively few infections.

In general, the Guatemalan sugar cane industry has coped quite well with this problem. It has collaborated with the general community through the donation of land and equipment for the construction of a hospital for Covid-19 cases in the sugarcane zone, and in the Experimental Station of CENGICAÑA. It has also collaborated with some communities to overcome the problem in other ways, eg through publicity, provision of alcohol sterilants and encouraging vaccination

Mario Melgar

India



It has been more than a year and a half since the Covid-19 pandemic penetrated the deepest core of human civilization across the world and has infected over millions of people in 213 countries and changed their everyday life, work and activities.

Impact on Sugar Industry

The sugarcane and sugar are predominant parts of the Essential Commodity Act 1955 enacted by the Parliament of India. Therefore, the sugar mills across the country did not stop for a day even during the time of pandemic and completed the cane crushing seasons both in the years 2020 and 2021.

The impact of the pandemic coincided with planting, production and harvesting at stages across the country. The farmers were affected due to lack of availability of labour for planting, harvesting and other agriculture inputs.

The sugar mills also encountered problems of reduced demand of sugar, shortage of labour and materials like sulphur, gunny bags etc for carrying out operations. The lower availability of sugarcane also forced the mills to operate at less than 100% capacity on occasions. However, the timely intervention of the Central and State Govts ensured availability of desired materials for the uninterrupted working of sugar mills.

Measures taken by the Sugar Industry to mitigate COVID Impact

The industry took several measures to contain the spread of the COVID 19 pandemic. Some of the measures taken by the sugar mills in India are summarized below:

Challenges to manage the Workforce/Labors/Farmers	**Measures taken to Mitigate Risk**
Risk of the spread of infection at plant/fields/villages	Educating the workforce, farmers and labour on preventive measures to be taken to ensure social distancing, use of masks and sanitizers

Regulatory : Restricting movement due to lockdown/curfew	Holding awareness programmes on improving health, hygiene and immunity
Psychological fear in minds of labour and workforce about spread of Covid	Organizing medical camps for periodic check up of the labour/farmers & periodic distribution of medicines, masks, sanitizers and food on need basis
Financial Impact due to additional expenditure on sanitary measures and lower income/unemployment	Modification of Work Flow through reduction in serial activities and adoption of technology
Social Impact - Restriction on social gatherings and ban on functions	Organizing transportation and other logistics for the farmers to get vaccinated at nearby health centres
Lower productivity & Migration of labour	Measures to improve mechanization to reduce dependency on manual labour

Production of Sanitizers

In a short time, the Indian sugar industry ramped up its capacity to produce hand sanitizers from a meager 1 million litres/annum to 3 milion litres/day. Today the country is not only self-sufficient in meeting its captive requirements but also exporting the same. As CSR activity the factories are also distributing the hand sanitizers to the farmers in their command area.

In the wake of the oxygen crisis, sugar mills and distilleries have decided to come forward to produce and supply the medical oxygen to overcome the shortage being faced by hospitals in several parts of the country.

Current COVID situation in India

India has fast recovered from the spade of second wave of COVID pandemic that hit the country in April-May 2021. Most of the states have eased curbs and the situation is returning to normalcy. The vaccination drive is also being done on fast pace with 4-5 million people getting vaccinated daily. By December 2021 the Govt. intends to vaccinate the entire adult population.

Status as on 11th August 2021	
Total COVID Cases	32,077,706
Recovered/Discharged	31,260,050
Deaths	429,669
Active COVID Cases	387,987
First Dose Recipients	40,69,80,329
Second Dose Recipients	11,66,90,690
No of Total Dose of Vaccine	52,36,71,019
Vaccination administered on 11th August 2021	441,962
Samples tested as on 11th August 2021	21,24,953
Total samples tested till date	48,73,70,196

In nutshell, India is more geared up now for any third wave of Covid, in comparison to second wave, most of the hospitals are geared up with their own oxygen plants, ventilators, childrens wards etc.

Sanjay Awasthi

Indonesia



Introduction

The Indonesian Society of Cane and Sugar Technologists (IKAGI) conducted a simple survey on the impact of Covid-19 on their members in this crushing season.

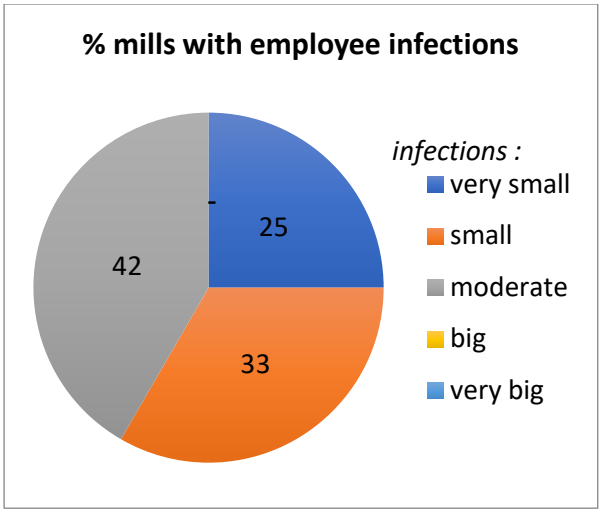
A number of questions were asked to a randomized selection of sugar mills. The answers are set in value from 1 to 5, which represents the magnitude of effect or level of impact starting from: very small (1), small (2), moderate (3), big (4) and very big (5).

Result

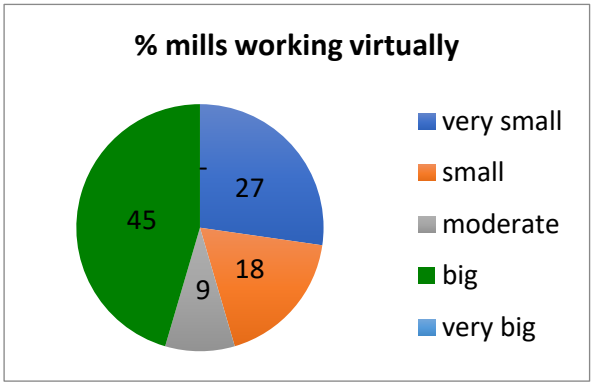
The result of the survey is presented below.

Impact of Covid 19

How many total employees were infected by Covid-19? (no symptoms, self-isolation, hospitalized, death)

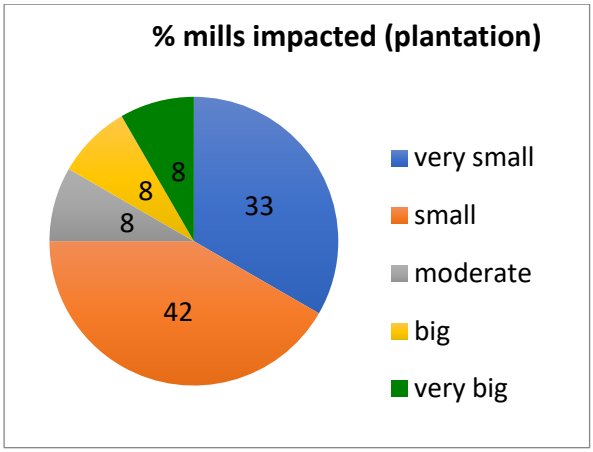


How often should operational activities be carried out by virtual/online/working from home?

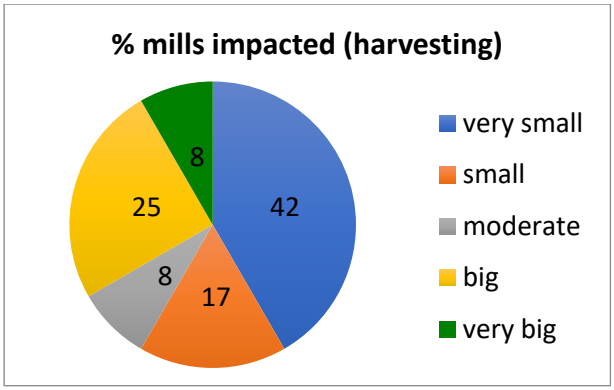


How much are these activities hindered by Covid-19?

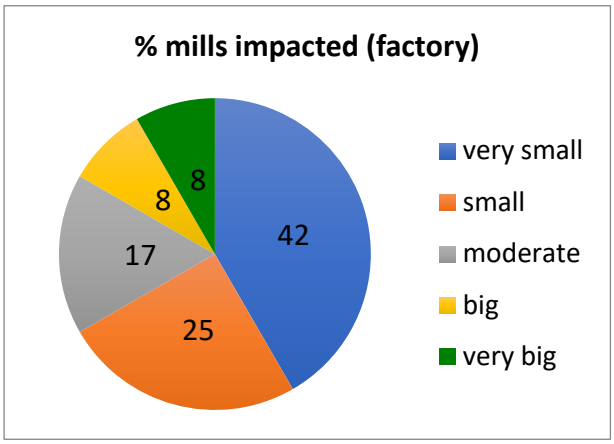
- **Plantation**



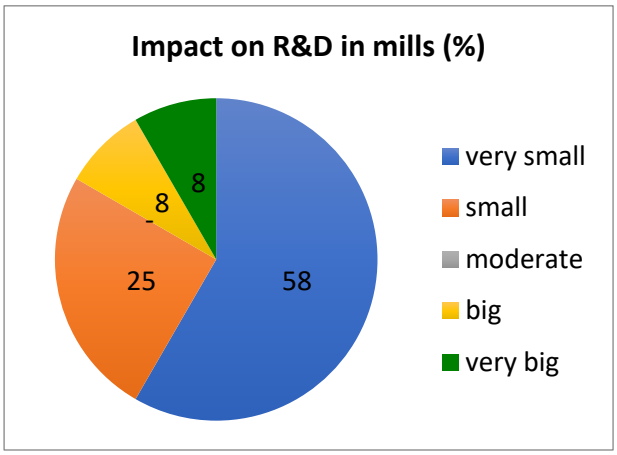
- **Harvesting**



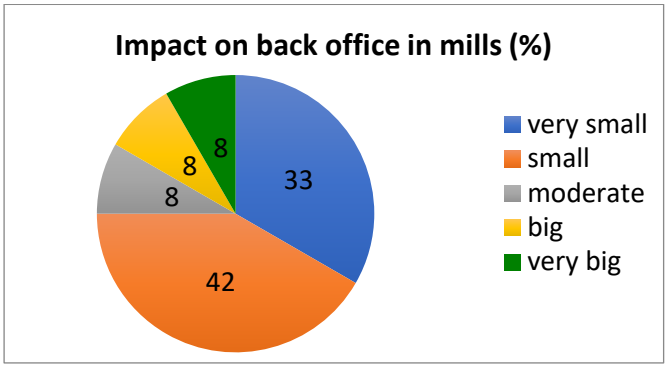
- **Factory**



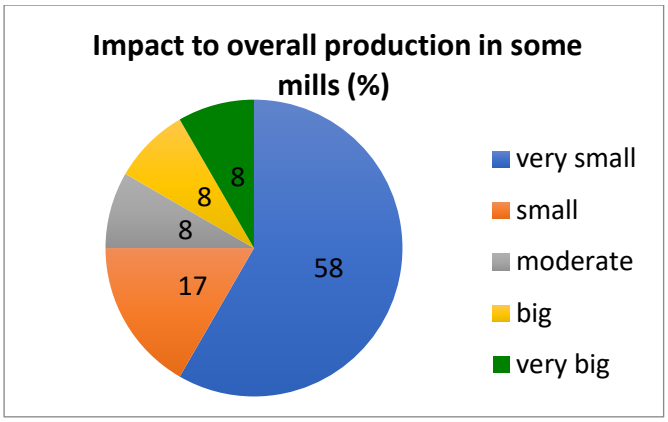
- **R & D**



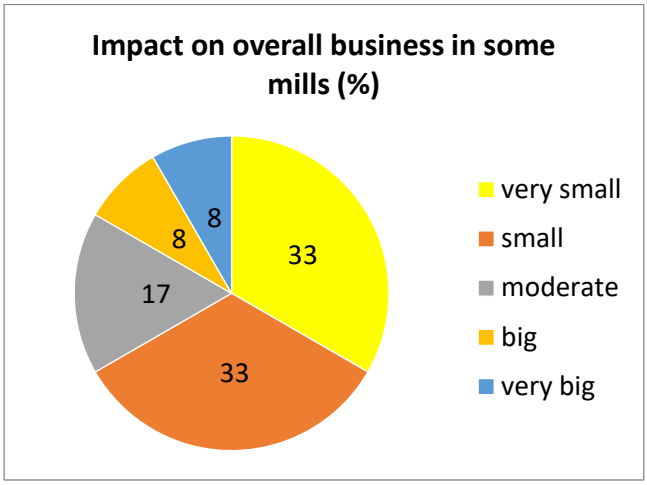
- **Back Office**



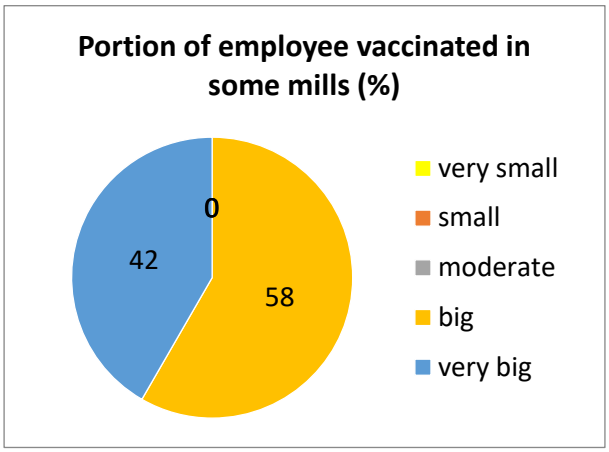
Overall productivity



Overall Business



How many employees have received the vaccine?





Role and support of the mills to community affected by covid 19 (YES/NO questions:

- Any special budget allocated for controlling Covid-19? YES : 91.7%
- Any food support for nearby community? YES: 100%
- Any logistic and infrastructure support for community (buildings, health facility) pertaining to Covid-19? YES: 100%
- Any company healthy products for community (disinfectants, herbs)? YES: 100%

Additional info:

- Mills' health facility dedicated for surrounding community
- Health safety protocol mandatory applied to all employees
- Some mills had 100% of employees vaccinated

Link address :
https://docs.google.com/document/d/1PAfkwnDGNVeYd0lPplCzCu0oA0CSeTW5/edit?usp=sharing&ouid=100507276279545710847&rtpof=true&sd=true

Dani Daniyanto

Mauritius

Covid-19 has affected almost all countries in the world, with only a few islands reported to be free from the disease. Mauritius, although isolated from the rest of the world, has not been spared from the SARS-COV 2 virus. Covid-19 has

impacted not only on the health system and social behaviour, but also on the different sectors of the economy, and the sugarcane industry has been no exception.

The first case of Covid-19 was reported in Mauritius on 21 February 2020; thereafter three new cases, followed by four cases on 19 March 2020. This prompted the government to declare a national lockdown as from 20 March that lasted until 15 June 2020, although partial activities resumed in many sectors as from 30 May. After resuming a normal life, in response to the resurgence of local cases, a second lockdown was announced in 2021 that lasted from 10 March to 30 April 2021. Both lockdowns occurred during the same period of the year and thus activities forecast during these months were affected on two consecutive years. However, it is important to note that government issued work access permit (WAP) to essential services, where those who had a permit could continue attending work. The sugarcane industry, at large, was affected in different ways during the two lockdowns.

Cane fields earmarked for replanting during the period mid-March to May were not planted and land preparation and plantations resumed after the end of lockdown with backlogs and delays. Short season and long season plantings were affected.

Delays in issuing WAPs to the stakeholders considerably affected the progress of repairs and maintenance works at the factory level and these resulted in the delay to the start of the harvest. At the field level, a number of cultural practices, including weeding and application of fertilizers, were delayed, while irrigation was halted, particularly in 2020. Sugar production in 2020 was at the lowest level in the last decade, being attributed to various factors, including climate and also to the repercussion of the Covid-19 lockdown.

At the level of R&D in sugarcane, the lockdowns affected a number of field and laboratory activities that take place during March to May. In both 2020 and 2021, the lockdown coincided with the selection period of the sugarcane breeding programme. Thus, selection of seedlings could not be carried out and was postponed to be performed in first-ratoon crop instead of plant cane. Field trial data as well as weather data usually collected during this period were not obtained. At laboratory level several projects were delayed, not only due to

absence at work, but also after resuming work. Mauritius depends a lot on overseas to supply itself with consumables and laboratory equipment, and the limited air flights serving the island caused a delay in a number in importation of such products.

Mauritius is having an upsurge of Covid-19 cases since July 2021 with a current peak of over 400 cases on 25 August 2021. In the light of the unprecedented number of cases, the protocol on measures to be taken in the event of suspected cases has been updated. The Rapid Antigen Test is now in routine application and if positive and whilst waiting for a confirmatory PCR test, self-isolation is advocated, if fully vaccinated. Standard Operating Procedures have been elaborated to access buildings and for some sensitive premises the necessity to be vaccinated for access. The vaccination programme of the country is well underway and it is expected to reach 800 000, i.e. over 60% of the population by October 2021.

The sugar cane industry is still bearing the brunt of the influence of the pandemic. Substantial increase in costs of inputs, equipment, spares and even disruption of supplies are being felt. The increase in costs are due to the general shortages and disruptions worldwide, but also to the depreciation of the Mauritian Rupee against the US dollar.

Given that sugar is a basic commodity, sales have not been heavily impacted by the Covid-19 confinements. It is felt that there was a marginal decrease in global consumption, which impacted on global prices during the first quarter of 2020. After that period, the situation recovered and deliveries from Mauritius have not been affected and all contracts in 2020/21 have been fulfilled in a timely manner. Likewise, it is expected that Mauritius would not have too much difficulty in selling the country's total production for the 2021 crop. The other side of the coin of the depreciation of the rupee that it has enabled the sector to benefit from additional export earnings and this has contributed to better remuneration in the price of sugar for the 2019 and 2020 crops.

Asha Dookun-Saumtally

Mexico



At the beginning of 2020, when the virus first appeared in Mexico, infection rates increased exponentially during the first half of the year. During the first wave, many people died.

After the first wave of COVID 19, the virus surged again at the end of 2020, but with lower intensity. To date 23% of the population have been vaccinated with two doses, and 50% with at least one dose.

However, with the appearance of the Delta strain the current situation is very grave. Many hospitals are close to collapse with thousands of people infected. Fortunately, fewer people have died following the rollout of vaccination. Officially, the number of people that have died with Covid-19 is around 300,000; a real tragedy.

The Mexican sugarcane industry contributed substantially to the fight against Covid-19. In response to a governmental campaign, several mills and distilleries provided ethanol to the Health Ministry. Others sent molasses to produce ethanol.

Within the sugar industry, during the last crop harvest (completed in June) many workers have been infected, but, given that most are young, the death rate has been low.

Actions within the mills and fields have seen:

FACTORY:

- Sanitary tunnel (hypochloride wash)
- Application of ethanol gel
- Measurement of body temperature
- Washing hands well with soap
- Obligatory use of face masks
- Maintaining distance between workers

Separation of the workers into two groups that work alternatively (8 hours each)

Additionally, no external people can gain access to the factory without a recent negative test for COVID 19.

FIELD:
The management of thousands of hand cutters, growers and supervisory staff was relatively easy. The unions signed a contract with health officials to implement continual monitoring, and any positive cases were immediately sent to hospital. The program was coordinated by CONADESUCA, the national agrobusiness commission, and had a very positive outcome in reducing the impact in all sugar cane regions.

Overall, the harvest proceeded relatively normally, with the 49 mills producing 5.715 Mt of sugar at 99.4 POL.

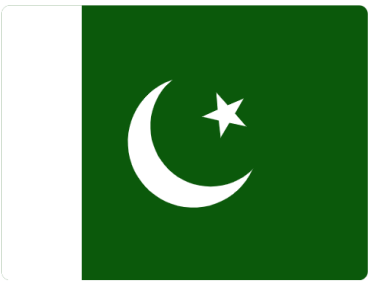
Although vaccination is speeding up, infection is growing exponentially with the appearance of the Delta strain. Young people are principally affected, and there remains many vaccination sceptics – the wild belief that vaccines somehow allow the implantation of 'chips that allow universal control'.

Attached are photos showing actions against the virus in mills.

NOTE: We are including general information of the CONADESUCA showing a map with the official registers cases into the sugar industry.
https://conadesuca.maps.arcgis.com/apps/webappviewer/index.html?id=4768bcb6904f4c18a239e623dfdbac5d

Manuel Enriquez Poy

Pakistan



Covid-19 impact on the sugar industry in Pakistan has not been significant, with the industry strictly following safe operating procedures. All the 90 Sugar Mills adopted recommendations and SOPs that significantly reduced the impact and spread of Covid-19 in the staff working inside sugar factories and

outside in the field workers. Pakistan sugar mills are in rural areas, which are already isolated, and all employees and their families have been vaccinated and sanitizers are installed at different places.

In the sugar industry, 4-5 people died due to Covid-19 all of which contracted the virus whilst traveling abroad.

There has been no Covid-19 effect on sugarcane farming and the yield has had a significant positive trend with an expected 10-15 % increase compared to last year. There has been no loss of cultivated area. The previous harvest concluded smoothly with little impact and the coming harvest is also expected to be normal. Labour availability is not seen as an issue with smart lockdowns from time to time to reverse the virus incidence. However, labour shortages are likely in the harvesting season if movement of workers is restricted due to full lockdown. Production of sanitizers was supported by the sugar mills having distilleries providing ethanol. Some sugar mills also produced sanitizer and distributed it with all precautions and adapted safe operating procedures.
Domestic consumption of sugar was reported as normal.

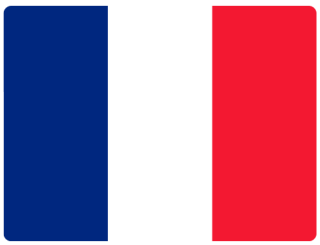
Most Covid-19 cases occurred in big cities such as Karachi, Lahore, Islamabad, Peshawar, Multan and Quetta.

Today's figures of Covid-19 in Pakistan are:

- Certified Cases: 1,140,411
- Recovered: 1,022,847
- Active Cases: 92,244
- Deaths: 25,530

Pervez Akhtar

Réunion



There was no direct impact of the pandemic on the 2020 harvest season in Réunion, which went on as usual: There was no second lockdown at the end of 2020.

In sugar factories, distilleries, power plants and research centres, as well as service companies (packaging, logistics, etc.), strict protocols have been established and implemented to ensure that employees have all the necessary information on avoiding COVID, especially concerning social distancing, a subject on which management has been heavily involved to ensure that they are respected in all circumstances. Thanks to this, even if employees have been infected in the context of their personal activities, no infection cluster has developed in the different companies.

The industry supplied the island with hydro-alcoholic products and participated in the supply of masks to front line staff at the very beginning of the pandemic. At the end of the first semester of 2021, the level of infection in Réunion was well below the average at the French national level.

However, in July the situation deteriorated with higher infection levels. This caused the authorities to take restrictive measures, but this did not affect the first month of the 2021 harvest.

At the end of August 2021 more than 60% of the eligible population (over 12 years) have been vaccinated, with about 50% having been completed immunized. This compares with 75% at the French national level. Most vaccinations have been with the Pfizer vaccine, but some have been the Johnson & Johnson one.

Given the difficulties in sea freight, we could experience delays in the supply of inputs (fertilizers, herbicides, etc.), which will impact on the 2022 crop.

Bernard Siegmund

South Africa



On 11 March 2020, the World Health Organisation declared the Covid-19 outbreak a pandemic. Here at home (South Africa), on 23 March 2020, President Cyril Ramaphosa announced a 21-day Level 5 lockdown, commencing on 26 March 2020. The lockdown strategy was employed to arrest the spread of Coronavirus. Fortunately, (Trade, Industry and Competition) Minister Ebrahim

Patel designated the industry as an essential service. This allowed the industry to operate fully.

There has been a high level of compliance with legislation and the recommended health and safety protocols by employers and employees in the industry. The 2020/2021 season saw extraordinary growth in local demand for sugar… by 14% compared to the previous year. This was partly due to changes in consumer habits during periods of Covid-19 lockdown but was more likely impacted by commitments of downstream stakeholders such as industrial, wholesale and retail purchasers to support South African producers as part of the Sugarcane Value Chain Master Plan to 2030, which was officially signed in November by all stakeholders last year (2020). In addition, there was a significant reduction in imports in the season, partly due to tariff protection, and partly due to countries that would typically export to South Africa experiencing their own Covid-19 related challenges in production and trade.

Through their ingenuity and commitment, SASRI scientists and support staff have, as far as has been possible, coped well with the pandemic and have managed to limit the negative effects of the pandemic on the research, development and innovation programme. Technology has enabled a great deal of data mining and publication preparation to happen remotely. For laboratory work, in-field measurement and trial maintenance, supervisors and employees have been divided into various shifts or groups and isolated from each other as much as possible.

Please check also the two links below:

- https://www.sacanegrowers.co.za/Content/Covid-19
- https://sa-fda.org.za/?page_id=1926

Trix Trikam

Thailand



The Covid-19 pandemic has been in Thailand since January 13, 2020 and is part of the global outbreak of Covid-19. Thailand was the first country to see confirmed cases of Covid-19 outside China.

The government's response to the outbreak began with screening and follow-up of exposures. In late March 2020, public and business premises were ordered to close in Bangkok and several other provinces, and the Prime Minister declared a state of emergency. There was a temporary ban on housing facilities from the night of April 3, 2020. It was largely cancelled in July and the country opened in August 2020. The government has not cancelled the state of emergency, and a new outbreak was detected around mid-December 2020, suspected of being from migrant workers who had been smuggled into the country.

The domestic vaccine distribution was not realized as planned and virus variants have been spread through the entire kingdom, leading to the current wave of infection.

The International Monetary Fund predicts that Thailand's GDP will shrink by 6.7% in 2020, down from the previous 2.5% growth. The sugar and cane industry might be included in this recession.

Following the first and second pandemic waves and government actions, the sugar cane industry was markedly affected by temporary closure of some sugar mills, lack of foreigner labour during the crushing season due to restrictions and quarantine, decreased domestic consumption and decreased total production. Hopefully, a more positive situation will be in place in time for the next crushing season from late 2021 until the end of March 2022.

Kitti Choonhawong and Sopon Uraichuen

Sugar Cane News

Sugar Rallies as Brazil Cane Fields Scorch, Ethanol Price Soars

Bloomberg	**Bloomberg**	**August 18, 2021**	**https://www.bloomberg.com/news/articles/2021-08-18/sugar-extends-rally-with-brazil-weather-having-lingering-effect**

Sugar rose, trading near a four-year high, as dry weather scorches cane fields and record ethanol prices encourage mills to process more of their crops into fuel.

Dryness is reducing yields and eroding the outlook for sugar output this season and the next in Brazil's Center South, the world's largest producing region, according to Plinio Nastari, president of Sao Paulo-based agricultural research firm Datagro. The heat has recently triggered several wildfires.

Sustainable sugar: Bonsucro unveils digital tool to map and assess supply chains

food ingredients 1st	**Food Ingredients 1st**	**September 2, 2021**	**https://www.foodingredientsfirst.com/news/sustainable-sugar-bonsucro-unveils-digital-tool-to-map-and-assess-supply-chains.html**

Bonsucro, the non-profit organization that promotes sustainable sugarcane production, has expanded its partnership with the technology platform, SupplyShift, a new supply chain mapping tool. Sugar Mapping allows Bonsucro members to track and monitor their suppliers' social and environmental sustainability measures at mill and farm levels. It can be used for certified and non-certified sugarcane, ethanol, molasses, and bagasse supply chains

.

The Sugar Mapping tool offers companies crucial insights into the performance from every tier of the value chain and allows them to make informed choices about their sugarcane sourcing. It is available via Bonsucro Connect.

Sugar cane farmers in Punjab end stir after hike in SAP announced [India]

THE HINDU	**The Hindu**	**August 25, 2021**	**https://www.thehindu.com/news/national/other-states/sugar-cane-farmers-in-punjab-end-stir-after-hike-in-sap-announced/article36090182.ece**

Sugar cane farmers in Punjab on Tuesday withdrew their protest in response to Chief Minister Amarinder Singh's announcement of a ₹35 per quintal hike in the State agreed price (SAP) for the cane crushing season 2021-22, taking the SAP in the State to ₹360 per quintal.

	The matter was resolved during a meeting of farmer union leaders with the Chief Minister here this afternoon, during which Capt. Amarinder, while agreeing to the SAP hike, said the State's fiscal situation had prevented an adequate increase in the SAP for the past 3 to 4 years. The farmer union leaders had earlier pointed out that Punjab had failed to hike sugar cane SAP in proportion to Haryana's over the same period, causing fiscal losses to them

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Louisiana Sugar Cane Festival and Farm Fest canceled for fall 2021

daily advertiser	**Daily Advertiser**	**August 25, 2021**	**https://eu.theadvertiser.com/story/news/2021/08/25/louisiana-sugar-cane-festival-cancelled-fall-2021/5574767001/**
	The Louisiana Sugar Cane Festival & Fair Association Board of Directors has cancelled the events planned for this September due to Covid-19 related surges. *Officials shared their gratitude in a press release. "We would like to thank our generous sponsors, membership holders and the community who continue to support our organization."*		

Sugar growers sue US over Florida reservoir water levels

AP	**AP**	**August 28, 2021**	**https://apnews.com/article/technology-business-environment-and-nature-florida-6a1c1a14793532d1f829e9d5281dc2db**
	Sugar growers in Florida are suing the U.S, Army Corps of Engineers over proposed reservoir water levels they say will be far too low. *The federal lawsuits filed this week by Florida Crystals' Okeelanta Corp., U.S. Sugar and the Sugar Cane Growers Cooperative say the current Corps plan won't supply enough water for their fields. "Farmers need a secure supply of water, and all farmers need certainty as we plan and manage our planting schedules and crop rotation," said Jaime Vega, vice president of agriculture at Florida Crystals.*		

Morrisons to begin selling Bottle Up's sugar-cane water bottles

NEW Food	**New Food**	**August 18, 2021**	**https://www.newfoodmagazine.com/news/155123/bottle-up-morrisons-expansion/**
	Sustainable bottle manufacturer Bottle Up says the sugar cane it uses in its bottles is carbon neutral and requires little to no irrigation, as it looks to revolutionise the 'grab-and-go' culture. *Bottle Up has announced an ongoing UK expansion with supermarket Morrisons to bring its sugar cane BPA-free pre-filled water bottles to more than 300 of Morrisons stores throughout August. The retailer will sell Bottle Up's refillable bottles at the majority of its stores by the end of 2021.*		

Commission of Agricultural Cost and Price wants sugarcane farmers' dues to be paid in instalments [India]

	Financial Express	**September 4, 2021**	**https://www.financialexpress.com/industry/commission-of-agricultural-cost-and-price-wants-sugarcane-farmers-dues-to-be-paid-in-instalments/2323561/**
	Payment of FRP is mandatory, and although sugar prices had collapsed in the last two to three years, mills still had to pay the FRP, he said. Therefore, several mills in Maharashtra have entered into agreements with farmers at the start of the crushing season to pay them in instalments.		

Brazil hopes the world will get a taste for its favourite spirit

	BBC News	**August 19, 2021**	**https://www.bbc.co.uk/news/business-58241729**
	*With bars and restaurants across Brazil closed for long periods since last spring and households not allowed to mix, **sales slumped by almost a quarter in 2020.*** *Producers and industry leaders now hope to boost overseas orders of cachaça, in order to compensate. But as Luciano Sadi Andrade, marketing manager at distillers Companhia Müller de Bebidas, admits: "It has always been a challenge... to explain the concept of cachaça for the foreign market."* *In his address, Minister Gobin commended the renewed public-private partnership, which will be beneficial for the Mauritian cane industry. He highlighted that with new bold measures introduced by Government and following consultations with captains of the sector and development partners such as the World Bank, the cane industry still has a bright future ahead.* *To boost overseas awareness, earlier this year Ibrac joined forces with the Brazilian Trade and Investment Promotion Agency (Apex-Brasil) to launch a 24-month promotional drive.*		

'A complete failure of the state': Authorities didn't heed researchers' calls to study health effects of burning sugar cane [USA]

	Palm Beach Post	**August 19, 2021**	**https://eu.palmbeachpost.com/story/news/local/2021/08/19/sugar-cane-burning-researchers-called-black-snow-health-studies/7690883002/**
	It was the eve of the 2015 harvest season in Florida's heartland. As they did every year, sugar companies prepared to torch swaths of cane, a practice that sends plumes of smoke into the skies near rural Lake Okeechobee.		

	This time, though, they faced mounting public criticism from residents and environmentalists, who claimed the smoke was making people sick. So on Sept. 30, industry leaders held a conference call with a special guest who tried to quell the objections: Pat Dobbins, the former head of a health department responsible for two Florida counties in the country's largest cane-sugar-producing region.

'A perfect storm': UK beet growers fear Brexit threatens their future

The Guardian	**The Guardian [UK]**	**August 19, 2021**	**https://www.theguardian.com/politics/2021/aug/18/uk-beet-growers-fear-brexit-threatens-their-future**
	In *a field in Norfolk, the sight of lush green leaves sprouting from the soil are giving farmer Ed Lankfer cause for optimism. "I think this is one of the best crops we have ever grown," he says, surveying one of his fields of sugar beet.* *Sugar beet has been grown on Lankfer's 225-hectare (556-acre) family farm in the village of Wereham since his grandfather first introduced it in 1928, alongside other crops. However, recent years of falling prices, coupled with risks from weather and disease, have many farmers questioning whether there is a future in growing it.* *This is before growers feel the impact of post-Brexit trade deals with large sugar producers such as Australia. It's a concern for Lankfer, whose land is in international trade secretary Liz Truss's constituency. He has twice hosted her at the farm to answer questions from growers* *...Imported raw sugar cane is often cheaper than British or European-produced beet, yet domestic sugar producers were protected by quotas and subsidies during the UK's EU membership while tariffs restricted the amount of cane imported, which goes some way to explaining Tate & Lyle's pro-Brexit stance..*		

One sugar refinery plans weekend restart after Ida

Food Business News	**Food Business News**	**September 3, 2021**	**https://www.foodbusinessnews.net/articles/19518-one-sugar-refinery-plans-weekend-restart-after-ida**
	KANSAS CITY — One of the two sugar refineries in the New Orleans area that were shuttered because of Hurricane Ida planned to reopen on a limited basis over the weekend with power restored at midweek. *The ASR Group (Domino) Chalmette refinery at Arabi, La., had outside power restored late Sept. 1*		

Belizean farmers diversifying from sugar cane, onion production; receive training on carrot production

	Breaking Belize News	**August 27, 2021**	**https://www.breakingbelizenews.com/2021/08/27/belizean-farmers-diversifying-from-sugar-cane-onion-production-receive-training-on-carrot-production/**

Belizean farmers who are diversifying from sugar cane and onion production are receiving training on carrot production.

Today, the National Extension Service held its third session of the Farmers Field School (FFS) for carrot production, according to a Facebook post by Minister of Agriculture, Food Security, and Enterprise Jose Abelardo Mai.

Hurricane Ida's impact on Louisiana agriculture hit timber and sugarcane; see video of damage

	The Advocate	**September 2, 2021**	**https://www.theadvocate.com/baton_rouge/news/business/article_4067b1f6-0c06-11ec-92b7-136b1eb6b521.html**

Power outages alongside mangled trees, ruined crops and damaged grain elevators were early indications of Hurricane Ida's impact on Louisiana's agriculture industry.

The Louisiana Department of Agriculture and Forestry did a flyover Thursday across parishes hard hit by the storm. Commissioner Mike Strain saw some stranded livestock and flooding in some orchards in Plaquemines Parish, but it's too early to estimate the total cost of damage.

Cane growers bitter at proposal to double the sugar tax [South Africa]

	IOL	**September 2, 2021**	**https://www.iol.co.za/business-report/companies/cane-growers-bitter-at-proposal-to-double-the-sugar-tax-6660ca03-b8c7-4a73-884f-ec014909ed45**

SOUTH African cane growers have responded with near vehemence to the proposal for the doubling of the Health Promotion Levy (HPL), also known as the sugar tax, citing the loss of 16 621 jobs across the industry and 9 000 job losses in the cane-growing sector alone in the first year of the sugar tax's implementation.

	In a statement yesterday, the chief executive of the SA Cane Growers Association, Andrew Russell, said calls by some public health scholars and the Healthy Living Alliance for the government to double the sugar tax showed zero regard for the impact the tax hike would have on the million people who relied on the sugar industry for their income, or for any discernible impact the HPL has had on reducing obesity levels in South Africa.

Gro Model Predicts Sucrose Decline in Brazil Sugarcane

	GRO Intelligence	**August 6, 2021**	**https://gro-intelligence.com/insights/articles/gro-model-predicts-sucrose-decline-in-brazil-sugarcane**
Gro Intelligence	*As both drought and frost hit Brazil's main sugar-producing region, Gro's satellite-data-driven model estimates the crop's sucrose concentration in the second half of July was 146 kg/tonne, or about 2% below the year-earlier period.* *Gro's TRS model for São Paulo state projects total recoverable sucrose (TRS) ahead of the semimonthly report by Brazil's Sugarcane Industry Association UNICA, enabling Gro users to get earlier insights on ethanol and sugar availability in the market. Sucrose is extracted from sugarcane and subsequently used to produce sugar or ethanol products.*		

Zimbabwe: High Dam Levels to Drive Sugarcane Output

	AllAfrica/The Herald	**August 23, 2021**	**https://allafrica.com/stories/202108230225.html**
AllAfrica	*The Lowveld's current dam water holdings are sufficient to irrigate Zimbabwe's sugarcane fields for the next three seasons, key industry player Hippo Valley says, as it plans to optimise on water availability to grow output.* *This comes as Zimbabwe's raw sugar producers are riding on a wave of improved harvests, which were stimulated by good rains experienced in the country during the 2020/21 rainfall season.*		

Prices of sugarcane have fallen by 80 per cent in last four years [Uganda]

Daily Monitor	**Daily Monitor**	**August 30, 2021**	**https://www.monitor.co.ug/uganda/business/finance/prices-of-sugarcane-have-fallen-**

			[by-80-per-cent-in-last-four-years--3531254](#)
	A new study by Economic Policy Research Center has found that prices of sugarcane have been declining at a drastic rate despite an increase in milling factories. *The report, which covers the period between 2017 and 2021, indicates that the price of a metric tonne of sugarcane has in the last four years fallen by close to Shs120,000, which represents a decline of about 80 per cent.*		

'Modern tech' is panacea for country's sugar output deficiency [Bangladesh]

	The Financial Express	**September 4, 2021**	[https://thefinancialexpress.com.bd/trade/modern-tech-is-panacea-for-countrys-sugar-output-deficiency-1630727731](#)
	The country has 1.4 million tonnes of sugar deficit which can be minimised through adopting modern sugar production methods, speakers said at a workshop on Friday . *They said modern production technologies should be used from planting to harvesting of sugar crops.* *The Bangladesh Sugar Crop Research Institute (BSRI) organised the training workshop on 'modern technology for sugar crop production' at Dhanbari in Tangail on the day.*		

Latest Research

New Solvent Mixtures Could Simplify Production of Biofuels like Bioethanol

New solvent mixtures developed by researchers from the Institute of Science and Engineering at Kanazawa University help break down the hard structure of plant cellulose for bioethanol production.

Researchers from Kanazawa University have now utilized a unique class of molecules known as "zwitterions" to make novel solvents with the potential to dissolve cellulose. Zwitterions seem to be unique in that they can exhibit a positive or negative charge, but at various locations on the molecule so they become incapable of neutralizing each other.

Published: 11 August 2021

> **Link**

Root Density, Distribution and Yield Relationships Of High Yielding Sugarcane Varieties Under Sandy Soil Condition

Roots are the less explored part of the sugarcane plant but are essential for sufficient nutrient and water supply to ensure better growth, development and sugar yield. An experiment using ten high yielding sugarcane varieties was conducted to determine the root characteristics and yield performance in sandy soil of Pampanga, Philippines.

Root density (RD) (g) and distribution at different soil depths from 0-100cm with interval of 10cm were 318.35 (46.47%), 132.36 (21.59%), 81.02 (14.05%), 26.24 (4.57%), 14.77 (2.61%), 14.58 (2.53%), 13.23 (2.32%), 11.53 (2.05%), 10.80 (1.93%) and 10.63 (1.87%). Stalk characteristics such as diameter, length and number of millable stalks and RD at 0-10cm, 11-20cm, 21-30cm, 51-60cm, 61-70cm, 71-80cm and 90-100cm were positively correlated with cane yield while percent brix and purity were positively correlated with sucrose content.
Information derived from this study may guide farmers in the selection of varieties suited in sandy soil including the adoption of appropriate cultural management practices for a more efficient utilization of resources.

Published: 29 October 2020

> **Link**



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Development of new enzymes and microbial cells for the enhancement of livestock feeds based on sugarcane fibre

We evaluate the efficiency of a regulatory change in sugarcane production (Law N°11.241/2002) that gradually banish the pre-harvest burning in the sugarcane production sector in the São Paulo state in Brazil, analyzing the occurrences of fires detected by satellite. To estimate the spatio-temporal dynamics of fire occurrence we use a structural representation in a log-Gaussian Cox process, decomposing the intensity function in components of trend, seasonality, cycles, covariates and spatial effects. The results have provided evidence that the trend component reflects the consistent reduction in fire occurrences, suggesting the efficiency of the mitigation actions implemented in the São Paulo state, and indicating a permanent advance in the environmental sustainability of this form of renewable energy production.

Published: October 2021

> **Link**



Alkaline pretreatment and response surface methodology based recombinant enzymatic saccharification and fermentation of sugarcane tops



In present study, the water-soluble extractives removal prior to alkali pretreatment of sugarcane tops (SCT) was carried out. The solid alkali pretreated SCT (apSCT) recovered on Field-emission scanning electron microscopy (FE-SEM) analysis showed exposure of cellulosic fibres as compared with raw SCT. The analyses of apSCT by Fourier Transform Infrared (FT-IR) Spectroscopy, X-ray diffraction (XRD) and High performance liquid chromatography (HPLC) analysis also confirmed the enhanced cellulose content in apSCT. Optimum conditions for response surface methodology based saccharification of apSCT at 40 °C, 150 rpm were 2.14% (w/v) apSCT loading in citrate–phosphate buffer (50 mM, pH 6.0), recombinant hydrolytic enzymes (from Clostridium/Hungateiclostridium thermocellum) loading for endo-1,4-β-glucanase (CtCel8A) = 213.2 U/g, cellobiohydrolase (CtCBH5A) = 272.5 U/g and β-glucosidase (HtBg1) = 299.8 U/g for 49.2 h. Under optimized saccharification conditions, the total reducing sugar yield was 265 mg/g (glucose 214 mg/g) of apSCT. Fermentation of produced glucose by S. cerevisiae gave 0.19 g/g glucose of bioethanol.

Published: December 2021

> **Link**

Factors influencing Australian sugarcane irrigators' adoption of solar photovoltaic systems for water pumping



Sugarcane farmers have several options to manage their energy costs of irrigation. One option these farmers are yet to widely adopt is solar photovoltaic (PV) systems for energy generation. The objective of the study was to understand the potential rate and peak level of adoption by Australian sugarcane irrigators of solar PV energy systems for water pumping and the key factors influencing adoption. This study used the ADOPT framework to examine farmers' adoption behaviour regarding solar PV systems. An industry survey and expert focus group findings were used to apply the ADOPT framework, and sensitivity testing was performed. The study found that after 10 years, 50% of sugarcane farmers were estimated to adopt solar PV systems for irrigation. Farmers' adoption decisions were predicted to be influenced by several factors including economic and environmental benefits, ease of use, existing knowledge, business risk, and the farmer's current financial position. Sensitivity testing revealed that improving the profitability from installing solar PV systems could markedly increase the level of adoption. Grid connection policies and government renewable energy subsidies that increased income or reduced capital costs and thereby increased economic returns for sugarcane irrigators could improve peak adoption levels by up to 40%. Government policies had a greater impact on adoption than environmental benefits generated by the PV systems. From the results we infer that the historically changing relative advantage of the technology has resulted in some farmers exercising the

option to hold off investing until they feel the relative advantage has peaked. This is the first study using the ADOPT framework to consider solar technology in Australia.

Published: October 2021

> **Link**

Conservation Agriculture for Enhancing Productivity, Resource Use Efficiency & Environmental Quality of Sugarcane Cropping System

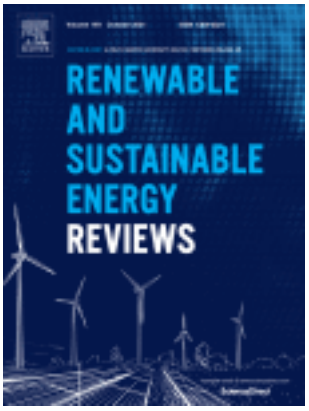


This bulletin provides a technical overview of the research work carried under AgriConsortia Research Platform on Conservation Agriculture (CRPCA) in sugarcane cropping system during 2015-2020. Here, sugarcane productivity under different proponents of conservation agriculture i.e. tillage, residue management coupled with planting geometry, irrigation, and nutrient management practices are discussed. Besides, economic analysis of tangible and non-tangible benefits, agronomic recommendations along with engineering based technologies developed specifically for sugarcane residue management are reported. The bulletin also includes highlights of capacity building programmes, relevant publications made and future research area under the research consortium.

Published: August 2021

> **Link**

Energy-carbon-water footprint of sugarcane bioenergy: A district-level life cycle assessment in the state of Maharashtra, India



Sugarcane bagasse-based cogeneration contributes significantly to bioenergy conversion in India and therefore, appropriate performance analysis is required considering the regional factors. Further increase of sugarcane bioenergy is expected in India with the Government's mandate to enhance the share of renewable energy by 2030. Herein this study, district-wise sugarcane bagasse cogeneration potential is assessed in the state Maharashtra, India. Variations in energy, carbon and water footprint of energy generated from bagasse-based cogeneration plants are also assessed for all the districts considering farm to gate attributional life cycle assessment (ALCA). Avoided product function (also called as System expansion) of simaPro 9.2 LCA software is used to assess the environmental benefits of sugarcane waste or by-products (leaves and tops, press-mud and bagasse ash). The annual bagasse production potential in Maharashtra is 19 million tonne, equivalent to 8206 GWh of cogenerated electricity. The potential varies markedly among the

districts (2–1500 GWh). Nearly 81 % of cogeneration potential is concentrated in 6 districts alone. The life cycle carbon footprint (0.075–0.2 kg CO_2e/kWh), the energy footprint (0.75–2.12 MJ/kWh) and the water footprint (206–516 L/kWh)-all the three estimated on the life cycle basis- differ considerably among the districts. The nexus among water, energy, and carbon footprint for sugarcane bioenergy is also analyzed to understand the complex interconnectivities among these individual resources. Cultivating high yielding varieties, use of renewable energy-based micro-irrigation, and installing modern cogeneration technology can lower the estimated carbon, energy and water footprint by up to 50 %. Such measures will help enhance farmers' income while addressing the sustainability issues in India.

Published: November 2021

> **Link**

Events

Thailand Sugar Conference / SUGAREX Thailand 2021

Fireworks Exhibitions and Conferences

9-10 September 2021

Khonkaen International Convention & Exhibition Center (KICE)

Khonkaen, Thailand

> **Link**

Sugar Summit

Tefla's

24-25 September 2021

Taj Convention Centre Goa

> **Link**

79th STAI Annual Convention and International Sugar Expo 2021

The Sugar Technologists' Association of India (STAI)

4-5 October

Online and National Sugar Institute, Kanpu

> **Link**

28ª Feira Internacional da Bioenergia

International Sugar Organization

9-12 November 2021

Sertãozinho, Brazil

> **Link**

30th ISO International Seminar

International Sugar Organization

23-24 November 2021

East Wintergarden, Canary Wharf, London

> **Link**

4th Agricultural Engineering, Agronomy and Extension Workshop [postponed]

International Society of Sugar Cane Technologists, CENICAÑA & TECNICAÑA

Postponed

Cali, Colombia

> **Link**

Sugar & Ethanol Asia

Informa Connect

1 – 3 December 2021

Bangkok, Thailand (and online)

> **Link**

11th Annual Africa Sugar Conference

Informa Connect

7-9 December 2021

Uganda

> **Link**

2022 S.I.T. ORLANDO CONFERENCE

Sugar Industry Technologists

17-19 April 2022

Orlando, Florida, USA

> **Link**

ASSCT Annual Florida and Louisiana Joint meeting

American Society of Sugar Cane Technologists

14-16 June 2022

Hyatt Regency Coconut Point Bonita Springs FL USA

> **Link**

American Sugar Alliance Symposium, Seattle, WA

American Sugar Alliance

29 July- 3 August

Seattle, WA, USA

> **Link**

ISSCT XIII Pathology Workshop [postponed]

International Society of Sugar Cane Technologists, Chacra Experimental Agrícola Santa Rosa and INTA´s Estación Experimental Agrícola Famaillá

Postponed

Salta and Jujuy, Argentina

> **Link**
