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Editorial...

I Grew up on farms – all sorts of farms in all sorts of places. The man from Snowy River had nothing on us! Indeed, my earliest years were spent on a soldier settler block that consisted largely of abundant quartz and even more abundant scrub running down onto the Snowy. Every few years I revisit the place and come away invigorated – great memories tinged with great relief that I don’t have to feed my four sons on the annual wool cheque.

I did get to experience other increasingly more viable farms and then of course, as you do, I went on the ‘wallaby track’ – often in countries that had no idea what a ‘wallaby’ was – and with current state of our international rugby team, this is even more the case now.

Engineering took me to many places around the world but it was agriculture that fed and clad me when I got there – where ever ‘there’ was.

So, travelled out, you come back home – which was made difficult by the fact that my family had relocated to another farm whilst I had been away and had failed to tell me where exactly that farm was.

But the promise of cheap labour overcame their reluctance and I was welcomed back to a minimum 12-hour day and a minimum – best described as ‘miniscule’ – wage.

But those generous benefits aside, farming was always full of ‘it’ – it being the satisfaction that comes from hard work done well – and the anticipation of a great crop that was about to come to fruition – and which seldom did.

But ‘it’ was never boring. Even in the non-digital years in the latter part of the past century there were fascinating things happening – or in the offing.

Now those then impending things have arrived – and at what a rate! There’s not an issue of this magazine goes by that doesn’t bring a host of media releases and articles revealing yet another significant technological advance. Great to be alive and be seeing this unfold.

And that being alive part is very important and at times, it seems almost miraculous that any of us can survive.

One of those recent media releases I mentioned above dealt with the mistaken belief in mythical causes of cancer that is rife according to new research in the European Journal of Cancer.

Researchers surveyed 1330 people in England and found that more than 40 per cent wrongly thought that stress and food additives (which would of course include sugar) caused cancer.

A third incorrectly believed that electromagnetic frequencies and eating GM food were risk factors, while 19 per cent thought microwave ovens and 15 per cent said drinking from plastic bottles caused cancer despite a lack of good scientific evidence.

It seems the number of people believing in unproven causes of cancer has increased since the start of the century which could be a result of changes to how we access news and information through the internet and social media – read here ‘fake news’.

What was very real – perhaps even a little surreal – about possible health risks when working in the sugar industry, came to my attention at the recent ASSSCT Conference in Mackay.

In an innocuously titled paper – Investigation of Underwater Bridge Inspections Methods by F Brandhorst and C Vanderneut of MSF Sugar – we learned that the authors had investigated the equipment and methods currently available for performing non-destructive underwater bridge inspections and their effectiveness in minimising the risk to personnel performing inspections.’

You don’t often come across agricultural industry personnel exposed to risks at work from sharks and crocodiles. As I said – agriculture is never boring! And yes, the report did come up with methods that kept the inspectors clear of sharp teeth.

In this issue...

What’s all the fuss about digital ag?

Predictive analytics, remote sensing, knowledge management and blockchain: buzzwords or the agricultural disruptors? Digital agriculture is causing excited chatter, especially about its potential benefits for farmers, industry, agribusiness, researchers and government. But why the fuss?

See article .................... Page 13

Bagasse into biochar

The old adage “one man’s trash is another man’s treasure” can be taken literally when it comes to residual material from sugar crops such as sugarcane, sweet sorghum, and sugar beets. These crops provide sugars, molasses, syrups, and other products to sweeten our foods. But during harvest and after sugar extraction, a lot of solid plant material is left over.

See article .................... Page 21

Weird – but clever!

Frankly, I have absolutely no idea how many times I have embraced the subject of Bulldog tractors within the pages of my books and magazine articles. The main reason for so doing is that of all the tractors about which I have written, Bulldogs unequivocally have attracted the greatest interest.

See article .................... Page 23
SINKER® fungicide from Nufarm controls primary infections of sugarcane smut and pineapple disease in sugarcane.

Developed in conjunction with industry research body Sugar Research Australia (SRA- previously BSES Limited), SINKER contains flutriafol, a highly soluble and systemic active ingredient in an easy to use formulation, with excellent activity against these two diseases.

SINKER® is compatible with Chlorpyrifos 500EC, Shirtan® and Astral® 250EC which provides flexibility with disease and insect pest management. Add Activator for improved coverage and resulting fungicidal efficacy.

Reduce the detrimental impact on sugarcane yield from sugarcane smut and pineapple disease today.

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LATE March and early April, Cyclones Nora and Iris dumped heavy rainfall along the northern Queensland coast and hinterland. Up to mid-April, far northern coastal cane regions have had between 1300 mm and 1900 mm. There have been wash-outs of headlands and creeks, which will take some time and expense to repair for the 2018 season, which is only weeks away.

**Assistance**

On April 11, 2018, Minister for Small Business Shannon Fentiman announced that disaster assistance has been activated for Small Businesses affected by the recent heavy rains across North Queensland and Severe Tropical Cyclone Nora and Associated Flooding.

Category B assistance has been activated for the Hinchinbrook Shire Council, the Cassowary Coast Regional Council and Cairns Regional Council.

Category B assistance includes concessional loans of up to $250,000 and essential working capital loans of up to $100,000.

Category B Natural Disaster Assistance loans are administered by the Queensland Rural and Industry Development Authority (QRIDA) on behalf of the Queensland and Commonwealth Governments. For more information or to apply visit www.qrida.queensland.gov.au or freecall 1800 623 946.

**Sustainability**

In January this year, ACFA NSW Director Robert Quirk attended Bonsucro week in Nicaragua.

Sustainability certification is becoming increasingly necessary to continue access to premium sugar markets. The following are statements made by key Bonsucro members and users of sugar.

“The Coca-Cola Company has a 100 per cent sustainably sourced goal for key agricultural ingredients which we will work to attain by 2020. Bonsucro certification is one way suppliers can help us meet that commitment. We will give preference to suppliers that are Bonsucro certified or meet other equivalent certifications.”

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Accreditation valid for five years - Please call or check web site for information on courses and schedules.

**Client feedback:**

The drift section was very engaging and interesting. Geoff made the course very enjoyable and thorough – N Dodd.

Great presentation. Good demonstrations. Clear explanations with good examples gained by experience – R Cooper.

Trainer proved to be very well informed in this subject. Great to listen to – G Peters.


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Stephen Ryan.
What’s on the Farm Tour radar for 2018?

- Southern Africa
- Iceland/Scandinavia
- Canada/US (Kropping the Klondike)
- Germany/Austria/Slovenia/Italy
- India & Sri Lanka
- Silk Road (Western China/Kazakhstan/Russia)

are farm study tours being offered in Jul, Aug & Sep. Space is limited on all tours but particularly Africa, Iceland and Slovenia – so be quick. Detailed itineraries can be found at www.greenmounttravel.com.au

For more than 20 years Greenmount Travellers have criss-crossed the globe visiting amazing agricultural, geographical and cultural destinations including China, Russia, South & North Americas, Cuba, Mexico, Canada, India, Tibet, Africa, Eastern & Western Europe, Scandinavia, United Kingdom, SE Asia, Japan, North Korea, The Kimberleys and Papua New Guinea.

Express your interest by giving Lloyd (0428 724 615) or David (0437 000 234) a call or visit www.greenmounttravel.com.au
PepsiCo commits to work with suppliers to source 100 per cent sustainable cane sugar by 2020.

Bacardi is committed to sourcing 40 per cent of its sugarcane based products from sustainably-certified sources by 2017 and 100 per cent by 2022. Bonsucro is our preferred standard.

These pledges demonstrate the gravity of sustainability certification in agricultural supply chains.

Markets
Sugar markets remain bearish on the near contracts, due to uncertainty about production in the main market influencers; i.e. Brazil, Thailand, India and the EU. Our currency seems to be the main object of hope for improving Australian dollar returns in the medium term.

Trade
World sugar markets are among the most protected and subsidised. Small increments of progress in access, tariffs and dumping have been made over decades but generally nations are resistant to liberalising their agricultural markets. This is because they seek to protect their rural and regional economies and secure regional votes. In recent weeks, US President Trump has taken on China over trade subsidies, as one year into his Presidency he needs to make significant gains on his policy to reinvigorate US industry, particularly manufacturing. Trump has issues with China in key areas of commerce, such as tariffs, intellectual property, transparency, joint ventures and currency.

Tariffs
Trump has railed against unequal tariffs between Chinese vehicles entering the US at 2.5 per cent versus US vehicles entering China at 25 per cent tariffs and duties.

Trump has threatened up to $150 billion tariffs on China. He has announced $50 billion of tariffs on Chinese imports and China has retaliated with $50 billion on US imports.

Research, extension and adoption
Sugar Research Australia (SRA) has taken major steps forward in the delivery of the industry-led Adoption Strategy for the Australian sugar industry with the appointment of two new SRA Regional Coordinators.

The Adoption Strategy has been developed in consultation with the Australian sugarcane industry and SRA’s Government investors and stakeholders over the past 12 months. It aims to provide a more strategic focus to increase the uptake and implementation of new and existing technologies in the sugar industry.

The first major milestone in the implementation of the Strategy was the recent appointment of Executive Manager, Regional Delivery, Mr Ian McBean, who will be based at SRA’s Meringa research station when he officially commences in May.

In addition, SRA has announced the appointment of Mr Daryl Parker as Regional Coordinator for the Far North Queensland (FNQ) region, and Ms Caroline Coppo as Regional Coordinator for the Herbert region.

Daryl was most recently Regional Extension Coordinator with the Wet Tropics Sugar Industry Partnership (WTSIP) and was previously Manager of Mossman Agricultural Services. Caroline was most recently Extension Coordinator with WTSIP, based in Ingham, and she also has experience with TropWater and Terrain NRM.
SRA CEO Mr Neil Fisher said Mr Parker and Ms Coppo would play a key role working with local industry and organisations in FNQ and the Herbert respectively to drive strategic outcomes for our sugarcane growers and millers in these regions.

**Ratoon stunting disease (RSD)**

The Far North Queensland sugarcane industry is joining together to combat the bacterial disease, ratoon stunting disease (RSD).

The disease has been known to growers, millers, and researchers for more than 70 years, but it continues to cost the industry through lost production and requires ongoing vigilance and management.

Sugar Research Australia Adoption Officer, Mr Gavin Rodman, based at Meringa Station near Gordonvale said: “RSD is something that can be managed by using disease-free planting material, keeping blocks free of volunteer cane from the previous crop and by maintaining good machinery hygiene practices.

“Unfortunately, some of these practices are no longer being followed religiously, which has led to a dramatic increase in infected cane throughout a large part of the Wet Tropics. Some mill areas within the Wet Tropics are reporting positive infections in 30 per cent of blocks tested.

“The cane that is being tested for use as planting material is meant to be the best cane we have. It is scary to think about what sort of numbers we are talking about when it comes to infection within commercial blocks.”

**Harvesting trials**

Sugarcane growers and harvester operators across the industry are invited to see first-hand how they could avoid losing valuable sugar from mechanical harvesting by participating in real-world harvesting research demonstration trials.

Trials over many years have shown that there are potential losses of sugarcane and juice (sugar) from common harvester settings. In the 2017 season, similar results were obtained in the first phase of this project.

As part of a major integrated program to help optimise harvest efficiency, Sugar Research Australia is offering sugarcane harvesting groups (growers and contract harvesters) the chance to see this research for themselves, in their own conditions, and with their own machinery.

According to Project Leader, Mr Phil Patane, SRA is targeting about 10 per cent of the harvest groups in each region for the coming 2018 harvest season.

These volunteer groups will collaborate to run a demonstration trial on one of the group’s farms and review the results to decide whether measures need to be taken to reduce losses.

“This project is designed to answer questions growers and harvester operators have about cane and juice loss with actual data and hard economics, specific to individual harvesting groups,” Phil said. “It will provide groups with the information to help optimise harvesting and on-going support through facilitated meetings and access to information.”

SRA will run the trials to international scientific standards and will coordinate the activity with our milling members.

The project is looking for harvester groups to participate in collaborative trials and workshops to help reduce losses.

In the 2018 season SRA is looking for about 60 groups to participate state-wide.
AT A GLANCE...

- Nutrition science began in 1910 with the discovery of vitamin A.
- Through the 1930s, nutrient deficiencies affected one-third of the US population.
- ARS provides objective data about what nutrients are essential for people to eat and what foods contain them.

The science of nutrition can be said to have any number of starting points: Wilbur O. Atwater’s 1869 analysis of the nutrient composition of corn, for example, or British Navy physician James Lind’s discovery that citrus juice can prevent scurvy in the first recorded nutrition clinical trial in 1747. But most researchers recognise the beginning of nutrition science as the 1910 isolation of the first vitamin, vitamin A.

Since then, 13 vitamins and 15 minerals have been identified as essential dietary components for optimum human nutrition and health.

**One-third of all recruits were nutrient deficient**

The federal government became directly involved in the vitamin and mineral content of our diet at the beginning of World War II. The spark for federal authority was that one-third of all US recruits were not acceptable for battlefield training because they were nutrient deficient. Many were suffering from pellagra, a disease caused by inadequate niacin (vitamin B3). About three million people in the United States had pellagra, with more than 100,000 deaths, between 1906 and 1940.

To solve the problem, the US government called for voluntary niacin fortification of bread. By 1943, the first War Food Order required that all flour sold in interstate commerce be enriched with several vitamins and iron.

These regulations more or less coincided with the issuing of the first Recommended Dietary Allowances (RDAs) for vitamins and minerals. US Department of Agriculture nutritionists expanded the guidelines in the early 1950s to include the number of recommended servings of each food group to make it easier for people to get RDAs of each nutrient.

This approach only reinforced the federal government’s responsibility to develop and gather knowledge about exactly how much of what components are in foods. Generating this information and collecting it in food composition databases became important responsibilities of the Agricultural Research Service (ARS) when the agency was created in 1953.

Today, businesses, researchers, and individuals around the world depend on these databases for accurate and objective nutrition information.

Food composition data provides the basis for calculating the numbers required on the Nutrition Facts labels that must, by law, be on every food product before it can appear on store shelves. While large companies may be able to afford to do their own composition analysis on new foods, many small companies rely on the information in the ARS food composition databases.

When human nutrient requirements were being established, ARS research played a major role in setting the majority of the recommendations. Although we know all the essential nutrients, new functions for them continue to be discovered. ARS research has shifted to nutritional health maintenance and chronic-disease prevention, since the largest share of health costs and deaths in the United States are now related to chronic disease.

Why else does ARS have the responsibility for nutrition research? The food in our diets is a product of agriculture, making agriculture the basis for our nutritional status. The relationship between agriculture and human nutrition is far more complex than it was thought to be 100 years ago. Then, most research was concerned with increasing yields so that everyone had enough to eat. Few considered whether breeding or growing practices could influence nutrient content.

Today ARS has research projects for improving the nutritional qualities of crops and livestock through breeding as well as production, storage, and processing practices. ARS scientists are also providing scientific evidence to answer questions such as whether genetic modification alters nutrient composition or how weather extremes impact nutrient content. Recent data suggest that increasing atmospheric carbon dioxide reduces some nutrients in crops. Since much of our harvests are shipped overseas where nutritional status is lower than in the United States, there is keen interest by business and governments in keeping nutrients levels from decreasing.

Commentary from David Klurfeld and John Finley: National Program Leaders for Human Nutrition

Drawn from: United States Department of Agriculture – ARS Magazine, March 2018

For more information: www.agresearchmag.ars.usda.gov
RESULTS of a recent study suggest that ‘harnessing the slow-release capacity of soil microbes by including molasses in a liquid fertiliser formulation improves the economic and environmental sustainability of sugar cane production for cane growers.’

In an interesting twist, it seems that molasses, itself a by-product of sugar production, may well assist in reducing farm fertiliser run off and improving water quality on the Great Barrier Reef.

Independent research by the National Centre for Engineering in Agriculture based at the University of Southern Queensland has found replacing traditional granular fertiliser with liquid fertiliser – that includes molasses – reduces nitrogen leaching by up to 17 per cent.

The “Harnessing microbial slow-release to improve fertiliser profitability and sustainability” research project was led by Dr Pam Pittaway in north Queensland’s Herbert River region with support from Liddle and Sons Agricultural Services in Ingham – the manufacturers of LiquaForce liquid fertilisers.

The research was officially presented at the Australian Society of Sugar Cane Technologists’ Conference in Mackay on April 19.

An enhanced efficiency fertiliser

“Our results show that molasses-amended liquid fertiliser should be considered an enhanced efficiency fertiliser as it significantly reduces the risk of fertiliser nitrogen leaching,” Pam said.

“This is a major finding for the sugar cane industry as we can confidently say that liquid fertiliser as a whole improves the retention of nitrogen in soil.”

Pam's research team specifically tested a liquid fertiliser blend manufactured by LiquaForce marketed as ‘Big Shot’ – a fertiliser developed for ratooning cane made up of nitrogen, phosphorous, potassium, zinc and sulfur, as well as the addition of organic components.

“The complex sugars used in BigShot slow down the release of fertiliser nitrogen by stimulating soil microbes to take up luxury amounts of nitrogen (N), converting some fertiliser to organic N,” Pam said.

“So, the reduced amount of fertiliser required for ratoon cane – and the improved work rate associated with applying the liquid product, improves the growers’ bottom line and reduced off-site nitrogen loss improves the environment.”

The research found that 39 per cent of the nitrogen from the BigShot liquid fertiliser blend was still in the soil 119 days after application, compared to just 27 per cent with granular fertiliser.

“This means 73 per cent of the nitrogen from the granular product and only 61 per cent of the liquid product was lost – mostly as leachate,” Pam said.

“This superior supply of nutrients provided to ratoon cane by BigShot liquid fertiliser, justifies the reduced application rate recommended by LiquaForce, and represents significant savings for growers and significant savings for the Great Barrier Reef.”

Managing Director of LiquaForce, Cameron Liddle, said the research results are good news for all agricultural producers working alongside the Great Barrier Reef.

“We started manufacturing liquid fertilisers 15 years ago with a focus on increasing farming profitability through increased tonnage and sugarcane CCS and overall fertilising efficiencies,” Cameron said.

“The core aim is to increase the longevity of the ratooning sugar cane cycle through soil health but also to ensure that we are formulating a product that has a positive impact on the environment – specifically water quality and the broader natural resources we’re lucky enough to have in north Queensland.”

“It hasn’t been something that’s happened overnight – the adoption of liquid over granular is an ongoing process we have worked on and will continue to work on with hundreds of growers along the eastern seaboard,” he said.

The study was commissioned by Liddle and Sons Agricultural Services Pty Ltd, with funding from an Australian Commonwealth Government Research in Business grant.

For more information: Dr Pam Pittaway, Senior Research Fellow, National Centre for Engineering in Agriculture – Research, E. Pam.Pittaway@usq.edu.au
As all in the industry are only too well aware, sugar and its impact on health and nutrition has been making the news – again. The issue will not be going away and so, must be addressed. In what may seem an ironic twist, an innovative Australian company is using a sugarcane extract to do just that – they are helping to address global diabetes and obesity.

Australian food flavouring company, The Product Makers (TPM) is aiming to improve lives around the globe with a sugarcane extract called Phytolin.

Many in the industry will recall the 2009 launch of the world’s first low GI cane sugar product, LoGiCane. Australian research and development firm Horizon Science worked with the Mossman Mill in far north Queensland for four years perfecting a process to lower the glycemic index of raw sugar.

With government funding – and with ongoing support from the Australian Sugar Industry – a considerable amount of work was done with natural purified sugar mill extracts. They were looking to retain and isolate polyphenols.

Polyphenols are compounds found abundantly in natural plant food sources that have antioxidant properties. There are over 8000 identified polyphenols found in foods such as tea, wine, chocolates, fruits, vegetables, and extra virgin olive oil.

Depending on your beverage of choice, you’ll notice them in tea that’s brewed too strong or in the back palate of red wine. Anything that makes your mouth pucker generally contains polyphenols.

In plants, polyphenols help defend against attack by insects and give the plants their colour.

In humans, studies suggest polyphenols may be beneficial when it comes to:

- Reducing obesity;
- Combating and helping to prevent the onset of type 2 diabetes;
- Controlling blood glucose homeostasis;
- Reducing blood cholesterol;
- Assisting in weight control and loss (by reducing the formation of fat tissue); and,
- Improving blood vessel dilation, enhancing blood flow and providing anti-inflammatory properties.

After considerable research and the development of a new membrane filtration process, the LoGiCane team was able to isolate polyphenols from the sugar mill processing extract.

The initial extract (Benecarb) was further refined and has now been patented and trademarked under the name of ‘Phytolin’ by TPM.

TPM CEO Shane Mitchell believes that “the health benefits of Phytolin not only include assisting the management of type 2 diabetes but delivers anti-oxidants and anti-inflammatory benefits that can address metabolic syndrome. These properties together reduce oxidative stress and inflammation in the body”.

**Phytolin and low GI**

The Glycemic Index (GI) is a measure of how quickly carbohydrates are digested or broken down in the body. High GI foods can result in rapid spikes and crashes in blood glucose levels, both of which can cause health issues.

A low GI diet can reportedly increase the body’s sensitivity to insulin. It forms part of a healthy diet, helping to lower and control weight, and leading to greater physical endurance and a general increase in your feeling of wellbeing.

TPM says that, when added to a high GI food, Phytolin will lower its GI level by slowing the rate of absorption of glucose into the blood stream. When tested by the Sydney University Glycemic Index Research Service, Phytolin added to sugar resulted in a product with GI of less than 55. Refined white sugar has a GI range of 68-70.

TPM has undertaken extensive research on the application of Phytolin. Their work has included adding the extract to a range of beverages, biscuits, cakes and muffins. When Phytolin is added to rice, bread and cereals, the company believes that there is an improvement in their health properties – and this is with minimal changes to existing formulations.

TPM have also transferred their intellectual property and technology of their globally patented low GI sugar, to their partners in India. This has enabled the launch of G-Low and Phytolin into the sub-continent.

India is one of the largest countries battling type 2 diabetes and obesity. It is well established that consumption of low GI diets and ingredients are key parts of the management of diabetes and obesity.

“Our commitment to this concept from inception, through development to launch has resulted in an Australian worldwide first. We’re incredibly proud that there is no other product available in the market, anywhere in the world, that provides the health benefits and bioactive properties of Phytolin” said Mitchell.

For more information: Shane Mitchell, CEO TPM; Email: info@tpm.com.au
PREVIOUS PAGE

What’s all the fuss about digital agriculture?

By Michael Robertson, Andrew Moore, Dave Henry and Simon Barry – CSIRO

Predictive analytics, remote sensing, knowledge management and blockchain: buzzwords or the agricultural disruptors? Digital agriculture is causing excited chatter, especially about its potential benefits for farmers, industry, agribusiness, researchers and government. But why the fuss?

Farmers need to be aware that, consistent with what has happened in other industries, new types of business will be created, new jobs will be required, existing jobs will change and some jobs may even disappear. For example, the increasing efficiencies from digital agriculture – especially robots – will increase the number of hectares and animals that one farmer can manage. This is the continuation of a century-long trend that has major social consequences in rural Australia.

We are at a vulnerable position on the ‘hype curve’ and there is fierce competition for market share among many new and established players in digital agriculture. The promises being made by the proponents of some technologies run the risk of sliding towards the trough of disillusionment.

For instance, there’s much talk of the ‘Internet of Things’ in agriculture. If the technology remains isolated from knowledge of agriculture and an understanding of the actual on-farm realities and business problems, then instead of contributing solutions it will remain on the shelf or be of interest only for niche hobbyists.

And what happens when predictive analytics start to match local knowledge? We are conducting social research to explore these trends and drivers. We need to be more mindful of how our research and development will influence the forces of disruption.

A key challenge is to find simplicity on the far side of complexity. Too much information can confuse and not clarify. Technologists need to appreciate that farmers do not need high frequency and precise data for every decision.

What’s in it for producers?

At the heart of digital agriculture lies the opportunity for sensing systems and associated analytics to lower the cost of knowing what’s going on and more accurately predict the future. This can come from improved knowledge about an individual enterprise, or via efficient sharing and learning from data from multiple enterprises.

We believe these developments offer three big opportunities:

- Increasing management precision, with producers able to use better information to make more timely decisions with more predictable outcomes;
- Automating tasks using sensing technologies and machine learning could cut costs and increase reliability; and,
- Better categorising, differentiating and tailoring agricultural products and services, which will open up new markets.

All these opportunities are around the point where development translates into practical use on the farm. As yet unexplored new value lies in grasping two or all three simultaneously. For example, crops could be selectively harvested from zones of the farm according to their quality characteristics and then put into different processing and marketing streams to maximise their value.

Crossing key technology frontiers

Just as exciting as creating new data and information, business models and technologies, is creating innovative ways of putting together and using existing ones.

Drones have proven their worth in agriculture and there are more innovations on the way.
New remote sensing systems, such as the European Sentinel satellites, will overcome many of the shortcomings of the established Landsat satellites. They will provide data at improved frequency, resolution and cost, with better access and timeliness. For example, satellite imagery can identify what is growing in each paddock and then forecast a yield or feed availability. This information can have a wide range of end uses: Farm management, farm advice, input supplies, risk assessment, planning for logistics and handling and assessment for drought relief.

But digital agriculture in Australia has been constrained by limited access and useability of satellite imagery. We are working alongside Geoscience Australia to create an Earth Observation Data Hub that will provide ‘data cubes’ of satellite information for applications in digital agriculture. The prototype has given, for the first time, imagery of the whole of Australia’s land area at a resolution of 25 square metres. It shows how land use, vegetation, water movements and urban expansion have changed over the past 30 years.

Remote sensing systems will be complemented by proximal systems, such as handheld devices or even cameras on smartphones. In precision irrigation, for example, there are exciting possibilities of linking satellite information, weather forecasts and crop models with ground-based, spot sensing of crop canopy temperature. This involves static infrared thermometers giving precise warnings of the need for irrigation over whole farms and the consequences of delay.

While sensors abound on the market, there are still some notable gaps. For instance, we still don’t have a sensing system that can non-invasively measure soil fertility nor diagnose animal health.

The fewer manual steps needed between data collection and decision-making, the more adoptable the digital technology will be. The experience with yield monitors in the grains industry, where only a minority collect, download and use yield maps, has taught us that simple, easy-to-use systems of data management will facilitate wider uptake by farmers.

Distributed sensing systems can form the basis for knowledge platforms for social learning. For example, our Chameleon soil moisture sensing system, used by smallholder irrigators in Africa, has a learning platform based on colour coding of soil moisture patterns. The data is shared among farmer groups to facilitate them testing and improving their own heuristics for irrigation management. Governments are interested in using the data at the level of the irrigation scheme to assess the performance of their infrastructure investments.

Knowledge discovery and management

The use of artificial intelligence, machine learning and natural language processing will streamline the discovery, access, usability, and confidence farmers place in data. We should grasp the big opportunities in synthesising disparate information that resides in often fragmented and difficult locations, such as government agencies, research and development funding bodies, product manufacturers and distributors, and on-farm data.

Doing this could unlock information for farmers and advisers. The research community has a long way to go in storing its data in safe, discoverable and interpretable forms so that it is not needlessly duplicated and can be reused for new purposes. The Australia National Data Service is making progress on this front and our Data Access Portal houses a growing number of valuable agricultural data sets.

Predictive analytics

At the moment our ability to collect vast amounts of data easily outstrips our ability to convert it into usable information. Predictive analytics can play a critical role for decision makers.
who need to interpolate and forecast from a current situation to an alternative state.

For example, we have developed solar-powered eGrazor collars for cattle to monitor and collect real-time data on the behaviour of each animal in order to infer feed intake. This can aid livestock producers in fine-tuning feeding regimes and grazing management. It can also identify individual animals that efficiently convert feed into meat and milk.

Coupled with a forecast of feed availability and the potential to control the movement of livestock with ethical ‘virtual fencing’, it is easy to see how digital agriculture is well placed to transform traditional livestock farming.

**Blockchain**

Agriculture and food are ideal domains to exploit the potential of distributed ledgers or blockchain. This emerging technology is most commonly associated with Bitcoin and other cryptocurrencies. But it can be used equally well in agriculture for decentralised and transactional data-sharing across a large network of untested participants. It enables new forms of distributed systems and agreements and captures transactions permanently, without relying on a trusted central authority.

Blockchain technology allows information to be carried along a supply chain; to match product to processing demands; to enable traceability, verify provenance and monitor quality and safety.

In future, a Tokyo restaurant could use blockchain technology to verify that a cut of wagyu beef originated from a particular farm in Tasmania.

Through blockchain, producers will be able to escape the trap of commodity production, where products cannot attract premium prices. Blockchain will open up ways for farmers to put their products into differentiated markets by allowing verification of provenance and other attributes. It will meet the demand by consumers for better quality assurance of their food and fibre.

**Novel communication systems**

A range of new players and enterprising producers are developing solutions to the chronic lack of connectivity and poor mobile coverage across regional Australia. There are examples, such as long range wide-area network (LoRaWAN), successfully operating a low-powered Internet of Things on farms already.
They show that not all digital agriculture activities require 4G mobile network coverage in the paddock. The benefits could extend beyond farm decision-making to rural or remote education, health and social wellbeing.

While improved communication will enable farmers to access greater amounts of information faster, it is not a solution in itself. Embedding analytics at the edge will shift the burden of processing large volumes of data from the communications network back to the point of collection. This will enable some applications without the need for high-end communications networks.

Value-adding to farm data

There is a huge opportunity in pooling data currently held in thousands of private hands to create products and services that farmers can use to improve their businesses. Working with farmer groups, we are actively exploring the viability of farm data-sharing arrangements.

Once data is shared, individual farmers can benchmark their production against others. For example a farmer could develop more precise soil maps for his or her farm based on aggregated soil test results, or gain a more accurate picture of rainfall patterns in the locality.

Governments and research bodies already pool lots of ‘small data’ and use it to monitor performance trends in the industry. The innovation challenge in agriculture is finding the right business model for farmers to participate in. Farmers tell us that if they are going to contribute their own data and trust others with it, they want an obvious and transparent explanation of how it will be used to benefit them and others.

New partnerships to even-up information asymmetry

There is currently an imbalance of information between farmers and agribusiness or government. By improving transparency and access to information of common interest, we have the opportunity to increase trust and reduce costs among different players in the industry.

We are part of a new company, Digital Agriculture Services (DAS), which is creating digitised valuations, automated risk assessment, insight and productivity trends for rural land. Such intelligence is of interest to farmers and institutions alike including banks, governments, agribusiness and commodity handlers.

Inventing e-extension

How do we link farmers with the most relevant and knowledgeable agricultural advisor anytime, anywhere? This is particularly important in an era where one-on-one extension advisory services are in decline. Artificial intelligence systems can now be used to mine and interpret knowledge banks. For farmers it opens up fragmented and inaccessible extension and scientific material, and enables them to gain tailored answers to specific queries. Such tools could form an adjunct to advisory services, and support inexperienced staff working in unfamiliar situations.

Enabling digital agriculture to flourish

All of these developments show why there is such excitement about digital agriculture. We are working broadly across this field and actively filling vital information gaps that will enable digital agriculture to flourish.

We have identified a need for data assets, like the digital soil map of Australia, and ongoing improvements. As well as working on remote sensing imagery with Geoscience Australia and on monitoring products for ground cover, soil moisture and feed availability, we’re working with the Bureau of Meteorology on climate forecasts at new time and spatial scales.

We are building techniques to allow users to integrate a diverse set of tools with data assets for apps, information services and analytic services. The information technology infrastructure will allow developers to link a climate forecast, a soil data layer, remote sensing imagery and other sensor streams with models and other analytical tools more seamlessly than in the past.

We aim to test the infrastructure by developing a series of innovative digital agriculture products in domains as diverse as grains, aquaculture, sugarcane, irrigated crops, and carbon farming. Our high risk, fast results, frontier research is producing digital tools for farmers and agribusiness that should start being released in the next few months.

We realise it is our role to catalyse commercial activity in digital agriculture and not ‘crowd out’ private and other public sector players. The start-up community for digital agriculture in Australia is still young and needs vital core technologies that have underpinned the flourishing of agtech in parallel markets in the US. Our role is to develop and deliver those technologies whether it is through licencing, research and development partnerships or free distribution.

We also need to improve some older decision-making tools to accommodate newer, data-driven approaches. The simulation-based approaches used in support tools like Yield Prophet and GrassGro were created in an era where data was sparse, poor in quality and infrequent.

With the advent of more data streams, informing end users of variables like soil moisture and feed availability, we are helping redesign and upgrade these decision-making tools.

Warning – disruption ahead

Digital transformation is everywhere and, as we have seen, agriculture is no exception. Among the consequences is the trend for the big agri-bioscience companies to transform themselves into knowledge-based businesses, consistent with their earlier transition from manufacturers of agrichemicals and inventors of crop traits.

The relationship between the farmers and service providers will become more about information management, and greater access to information will alter the power balances between the different players in agriculture. Digital technologies reduce the advantage of being the local incumbent. Local knowledge and agility have been the traditional bulwarks of the family farm as an Australian institution.

Given the intersecting food, water, energy and climate change challenges that the world and Australia face, embracing digital technologies for agriculture gives us a significant opportunity. Australia is also a major trading nation and the highly competitive nature of international commodity markets means that we ignore these technologies at our peril.

See our digital agtech on show in August 2018 at our AgCatalyst event in Melbourne.

Dr Michael Robertson is the Deputy and Science Director of CSIRO Agriculture and Food. His research background is in crop agronomy and simulation modelling in broadacre farming systems to inform better management regimes for economic, environmental and social outcomes.

Dr Andrew Moore leads CSIRO’s Digscape Future Science Platform – frontier science to create next-generation decision tools that will transform the agriculture and land management sector. He started his scientific career as an ecologist before moving into agricultural ecosystems.

Dr Dave Henry leads CSIRO’s digital agriculture initiative.

Dr Simon Barry is a research director in analytics research at CSIRO’s Data 61.
Editorial

By Gerard Puglisi,
ACFA Next Gen Officer

The Next Gen program’s aim is to facilitate and encourage an active network of young and established farmers in each mill region. Since I have started the role of ACFA’s Next Gen Officer, I have undertaken annual road trips from Mossman in the north down to Harwood in the south and travelled over 85,000 kms.

On this year’s journey through the industry I had the privilege of meeting well over 280 innovative farmers both young and old. I find these meetings very productive and the feedback very encouraging – I am sure that the sugar industry has a ‘Sweet Future’. Being able to meet with fellow farmers from different regions and talk with them about the industry issues and farming practices relevant to them, has been very exciting for me.

In March the Next Gen team had the pleasure of hosting the third Case IH Step up conference at the MECC in Mackay. More than 220 cane farmers, cane professionals and industry stakeholders met to discuss both the future of the Australian sugar industry and the future for young farmers in our industry.

The conference aimed to build on the Next Gen program’s established network of young and established cane farmers across Queensland and Northern New South Wales.

Of the delegates that attended, around 170 were younger farmers. They were given the opportunity to immerse themselves in the current reality and future possibilities of issues such as best farming practice; precision farming; sugar marketing; RD&E; agricultural engineering and technology – all in the context of this digital era. And they took a close look at financial products and succession planning to help ensure that their family farms would prosper in this new environment.

The theme of the conference was Transition and Innovation. A very impressive speaker line-up was drawn from all industry sectors and they certainly delivered on the day, talking passionately and persuasively about the new challenges – and opportunities – facing all farmers.

The Next gen program wants to encourage younger people to ‘Step Up’ and take more of an industry role.

All in all, it was a very exciting and a very inspiring conference. I hope that the Next Gen Team – with the support of our industry – can continue to encourage and inform all our Next Generation farmers.
Though some of agriculture’s technology game-changers may appear to be a speck on the horizon, some aspects may be closer than we think, according to speakers at a major sugarcane conference in Mackay, Queensland.

The Case IH Step UP! Conference began as scheduled with a dinner for delegates, a relief for organisers who were forced to postpone last year’s event due to Cyclone Debbie.

Robert Johnson, Regional Marketing Manager for Precision Solutions and Telematics with Case IH parent company CNH Industrial, addressed the conference this week. He discussed the future of innovation in agriculture, including Precision Ag and Case IH’s progress in the area of autonomous technology, highlighted by the 2017 unveiling of Case IH’s Autonomous Concept Vehicle (ACV), which visited Australia last year.

“Agtech offers improved productivity, along with quality and yield; it also offers enriched sustainability and less wastage,” said Robert. “We believe that the ongoing work on technology that has come out of the ACV’s development is the start of something amazing for agriculture.”

Robert said Case IH also valued its long association with the Australian sugarcane industry and praised the innovation and drive that had made it such a success on the world stage.

“Sugar is the second largest export crop in Australia after wheat, and Australian producers have always been at the forefront of innovation and adoption of technologies that continue to drive the industry’s productivity.”

The Conference heard from 17 consistently impressive speakers addressing subjects including the future of precision agriculture, new sources of revenue from sugarcane, sustainability, environmental management and marketing and pricing.

Attendees also had the chance to both meet with a wide range of trade exhibitors at the venue and to attend a series of field trips and go hands-on with spraying, fertiliser application, planter automation and the use of drones and data sensors.

Sponsored by Case IH since its inaugural event in 2013, the conference is a chance for both young and established farmers, millers, researchers and harvesting contractors to discuss and learn about innovation, sustainability and profitability, and encourages the transfer of knowledge between generations.

“The Case IH Step UP! Conference is a fantastic initiative, and one that we are very proud to put our name to,” said Pete McCann, Case IH General Manager, Australia and New Zealand. “Case IH has a long history with the sugarcane industry, which began with the development of the Austoft harvester. The diversity of attendees opens up opportunity for really meaningful discussion about the industry and its potential in the future.”

Gerard Puglisi, Australian Cane Farmers Association (ACFA) director and Next Gen Officer, said, “We are excited to again have the support of Case IH this year. It’s really encouraging that a big global brand can see the value in young people in agriculture, and without the support from sponsors like Case IH, the Next Gen program would not be where it is today.”
Growers, millers, and innovators of the Australian sugarcane industry gathered in Mackay March 26–28 for the NextGen StepUp Conference.

The biennial conference provides the opportunity for the young (and young at heart) to share, learn and explore ideas with a range of industry stakeholders.

The StepUp conference is an extension of the work of the NextGen program, which is building capacity and leadership in the future generations of the Australian sugarcane industry.

SRA CEO, Mr Neil Fisher, said that SRA was a proud sponsor of the StepUp conference and the NextGen program.

“SRA is committed to enhancing capability within the Australian sugarcane industry, and we have identified this requirement within our five-year Strategic Plan,” Neil said.

“The investment in NextGen is a means of delivering significant human capability development for the industry. Young farmers, researchers, and industry professionals are the future of our industry.

“NextGen is helping our industry people become future innovators to ensure a productive, profitable, and sustainable future for the Australian sugarcane industry.”

The 2018 StepUp conference was themed Transition and Innovation.

SRA also supported a group of NSW growers to attend the conference as part of its Travel and Learning Awards development program.

In addition, SRA also provided research information at the conference through presenters Mr Phil Patane (harvesting efficiency demonstration trials), and Dr Danielle Skocaj (nitrogen management in the Wet Tropics).

Prof Ian O’Hara from the Queensland University of Technology who is currently working on a major research project through SRA and spoke on new sources of revenue from sugarcane.

“SRA is proud to be a part of this innovative and forward-looking event that is contributing to a bright future for our industry,” Neil said.

**Phil Patane – harvesting efficiency demonstration trials.**

**Dr Danielle Skocaj – nitrogen management in the Wet tropics.**

**Prof Ian O’Hara – new sources of revenue from sugarcane.**
Technology driven disruptions are increasingly driving growth in rural industries. While Australian agriculture has a strong record in technology development and adoption, we need to proactively seek alternative sources of innovation and sift out the potential game-changers.

This is the focus of new foresighting work commissioned by AgriFutures Australia and developed by the Queensland University of Technology (QUT). ‘Horizon Scan’ is a four-part series, highlighting a range of futuristic technologies, trends and innovations, each with the potential to transform rural industries.

AgriFutures Australia Managing Director, John Harvey said the scans seek out high-impact technologies overseas and in other sectors of the Australian economy with the potential to translate to the agricultural context.

“Some technologies identified have obvious applications, others need a little more imagination. For example, the scans identified moisture harvesting, metamaterials, personal analytics, solar retransmission and human-machine interface as potentially impactful emerging technologies,” said John.

“We want businesses and researchers to look to other sectors to understand their use of technology and use the scans to start a conversation. If we are to compete on the world stage, we need to open our eyes to what is possible and embrace these opportunities.”

**Foresight methodology**

QUT have developed the novel foresight methodology for identifying and decontextualising emerging technologies, led by QUT Senior Lecturer in Ecology, Dr Grant Hamilton.

“Given the many avenues in which new technologies can emerge, building foresighting capability with which to identify the most impactful innovations is essential for participants right along the supply chain. It is critical to informing future scenario planning as well as supporting industries to maintain a competitive edge,” said Grant.

“We know new technologies have the potential to expand existing markets as well as create entirely new ones. Early identification of emerging technologies enables individuals, businesses and industries to turn a potential disruption into a new business opportunity.”

AgriFutures Australia is committed to continuing to scout for new technologies and innovations, additional fact sheets will be added to the Horizon Scan series in 2018 and early 2019.


The Horizon Scan series is funded by the AgriFutures National Rural Issues program which forms part of the AgriFutures Australia National Challenges and Opportunities arena.

For more information: Georgie Davies, Manager Communication
E: georgie.davies@agrifutures.com.au
Plant biologists have made an important discovery about rising temperatures and wheat crops – and subsequently learned that the Romans suspected the effect more than 2000 years ago.

In research, published in the journal *Scientific Reports*, the ARC Centre of Excellence in Plant Energy Biology scientists at the University of Western Australia studied what happens when wheat plants cannot get enough oxygen because of flooding.

They found the wheat was more susceptible to damage from flooding as the temperature got warmer – only to later read a Roman farming handbook that hinted at the same effect.

*De Agri Cultura*, believed to be written by Cato the Elder in 160BC, suggests rainfall can be left on wheat fields through the cold part of winter but will damage the crops if not removed by spring.

Lead researcher Dr Shaobai Huang said the study looked at what different types of wheat plants make inside their cells to help them cope with a lack of oxygen.

“We tested the plants at 15°C to 28°C, and we found a dramatic negative impact on how well wheat plants recovered from a lack of oxygen under the higher temperatures,” he said.

“Not only is temperature arguably more important than the type of wheat, but small temperature changes can make a huge difference.

“At 20°C they were fine but at 24°C they suffered really badly.”

ARC Centre of Excellence in Plant Energy Biology Director, Professor Harvey Millar, said climate change was poised to deliver a double blow to wheat plants, with both increasing temperatures and a greater chance of flooding.

“This research shows that we don’t need temperatures to rise at the hottest part of the year to have a big impact on our crops,” he said.

“It might just be the difference between having a cool spring or a warm spring.”

But Harvey said being able to understand the mechanism inside wheat cells that is behind the 2000-year-old agricultural advice offered new hope to farmers.

“The Romans knew the problem but they didn’t have any way to try and find a solution, other than to drain the field” he said.

“Today we now know that amino acids play an important role in how plants respond to a lack of oxygen.

“Based on this new research we may be able to come up with a breeding solution, because after 2000 years we finally understand the mechanism behind the damage to wheat.”

For more information: Dr Shaobai Huang – E. shaobai.huang@uwa.edu.au
Professor Harvey Millar – E. harvey.millar@uwa.edu.au
After years of supporting a rotating cast of crops, the soil’s nutrient supply is often exhausted. The tilling, turning, and planting also degrade the organic matter in the soil and its ability to stay hydrated.

“All that moving and disturbing of the soil really beats it up,” says Eugenia M. Pena-Yewitkhiw, a plant and soil scientist at West Virginia University. “So, it’s helpful to let it rest, let it wait. The question is, how long?”

Letting the soil rest can be difficult economically for farmers, so Eugenia wanted to discover the least possible amount of time it would take to allow the soil to heal from intensive crop rotation.

To answer that question, she planted sod – or grasses – in a field that had been cycled through four consecutive years of row crops.

Eugenia replaced the row crops with a combination of perennial grasses and legumes, which only needed to be planted once. The soil got a break from tilling, which disrupts soil clumps and compacts the soil, making it more vulnerable to erosion and dehydration. Compacted soils also don’t allow roots to penetrate easily, making it difficult for plants to thrive.

During this break from activity, the grasses and legumes flourished. When the grasses were mature, Eugenia brought sheep to the field, letting them graze and spread their manure on the soil. The sheep were crucial because their manure restored organic matter to the soil. Organic matter is like vitamins for soil: it gives it a nutrient boost, helps it retain water, and feeds helpful bacteria. In addition to feeding the sheep, the grasses can be harvested for hay.

“If you think about it, it’s the perfect cycle,” said Eugenia. “You’re combining two passive management strategies.”

Three years on the road to recovery

After three years, Eugenia found signs of health returning to the soil. There were more organic matter and nutrients in the soil. Two plots are ready to be planted with grasses: one with manure and one without. (PHOTO: William Bryan)
soil. The soil’s ability to clump also improved, making the soil porous enough to allow roots to infiltrate. Root systems break up the soil, improving the structure and adding nutrients when the roots decompose.

“Three years is not bad,” said Eugenia. “It’s not too long, and there are some big differences.”

But she was quick to say that there’s no magic number. Local conditions, like weather and soil type, matter. Some soils may take longer to recover, and some soil characteristics, like pH, take longer to improve. “The soil is constantly changing,” she said.

“We can improve it only to a point. But we can make it better.” She also said there are some important management lessons to take away. For example, allowing the sheep to overgraze will damage the grasses and the soil.

But giving the soil a break is a time-honoured tradition. Europeans have used this method for hundreds of years. The practice didn’t catch on in the United States – or Australia.

But restoring soil health is an important part of sustaining the planet’s population. Eugenia wants to find ways for farmers to feed people and heal their soil. “We can’t produce food from thin air,” she said. “It always starts with the soil.” And even three little years of rest will make a difference.

For more information: www.agronomy.org/news/media-inquiries/releases/2018/0307/975/
Outlook for sugar to 2022–23

By Benjamin K Agbenyegah, ABARES

Sugar prices low in the short term

The world indicator price for raw sugar (Intercontinental Exchange, nearby futures, no. 11 contract) is forecast to fall by 19 per cent to average US14 cents per pound in 2017–18 (October to September marketing year). In 2018–19 the price is forecast to decline by a further 9 per cent to average US13 cents per pound. World supply of sugar is growing faster than demand in the short term following record production in 2017–18.

The world sugar price is projected to reach US15 cents per pound (in real terms) in 2022–23. World demand is expected to grow slowly as population increases but health awareness reduces the rate of increase in per person consumption. As a result, the world price of sugar in 2022–23 is expected to be 30 per cent lower than the 10-year average to 2016–17. Despite growing populations and incomes in emerging economies, health awareness is expected to moderate demand for sugar and reduce the likelihood of per person consumption reaching current levels in developed nations.

Returns to Australian cane growers to remain low

In 2017–18 returns to Australian cane growers are forecast to fall by 8 per cent to average $34 per tonne of cane cut for crushing, largely due to a forecast decline in the world sugar price. Returns to growers are forecast to fall again in 2018–19 to $32 per tonne (in nominal terms) and to remain at $32 (in 2017–18 dollars) per tonne until 2022–23.

Sugar production maintained despite a decline in cane crush

In 2017–18 Australian sugar production is forecast to be 4.7 million tonnes. This is despite a 10 per cent decline in cane crush due to dry conditions and damage to Queensland cane caused by Tropical Cyclone Debbie. In 2018–19 Australian sugar production is forecast to reach 4.8 million tonnes and to stay around this level to 2022–23.

Area of sugar cane harvested in Australia over the medium term is projected to remain largely unchanged at around

![FIGURE 1: Sugar production, consumption and returns to cane growers, Australia, 2011–12 to 2022–23](chart)

AT A GLANCE...

- Growth in world production is expected to keep sugar prices low.
- World sugar consumption is expected to grow at a moderate rate because of increasing health awareness.
- Returns to Australian growers are projected to remain low over the medium term.
385,000 hectares – compared with 380,000 hectares in 2017–18. Limited suitable land close to sugar mills and Queensland farmers’ increasing interest in horticulture are leading to increased competition for land use. Cane yields are assumed to remain around the 15-year average to 2016–17 of 88 tonnes per hectare.

Australian per person sugar consumption is expected to fall over the medium term as dietary preferences change in response to health concerns. Over the 10 years to 2016–17 Australia’s sugar consumption averaged 54 kilograms per person, more than double the world average of 24 kilograms per person. Australian sugar consumption is forecast to remain unchanged at 1.2 million tonnes in 2017–18 and 2018–19 because population growth is expected to offset falling per person consumption.

By 2022–23 Australian sugar consumption is projected to fall to 1 million tonnes, 15 per cent lower than the forecast for 2017–18.

**Exports**

Australian sugar exports are forecast to fall by 3 per cent to around 3.8 million tonnes in 2017–18 and to remain largely unchanged in 2018–19. Lower prices are expected to reduce the value of these exports in 2017–18 by 23 per cent to around $1.9 billion and in 2018–19 by a further 11 per cent to $1.7 billion (in nominal terms).

Australian sugar exports are projected to remain largely unchanged at around 3.9 million tonnes per year to 2022–23, when they are projected to be worth around $1.8 billion (in real terms).

**TABLE 1: Outlook for sugar**

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<td>Brazil Mt</td>
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<td>186</td>
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<tr>
<td>Exports Mt</td>
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<td>Price c</td>
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<td>Export Value nominal A$m</td>
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<td>1,861</td>
<td>1,663</td>
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<td>1,886</td>
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<tr>
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<td>1,891</td>
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<td>1,886</td>
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<td>37.2</td>
<td>34.3</td>
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<td>33.1</td>
<td>34.7</td>
<td>36.0</td>
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<td>Return to cane growers real g A$/t</td>
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**Notes:**


**Sources:** ABARES; Australian Bureau of Statistics; International Sugar Organization

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**FIGURE 3: Australian sugar exports, 2011–12 to 2022–23**

![Figure 3: Australian sugar exports, 2011–12 to 2022–23](image-url)

Drawn from Agricultural commodities – March quarter 2018

For more information visit: www.agriculture.gov.au/abares/publications
As the nation’s cane farmers prepare for the annual crush later in the year, Case IH is giving them something else to consider in their planning for the season.

The release of the Austoft 8010 Series is a major update to the company’s sugarcane harvester product offering, with 28 new features and improvements that came out of more than 18,000 hours of field-testing.

“The last Austoft series release was the 8000 Series, and we’re confident growers will appreciate the improvements in these new machines and what they have to offer in the testing environment of an Australian cane paddock,” said Pete McCann, Case IH General Manager for Australia and New Zealand.

Among the new features are LED work lights, a raised cab position for better operator visibility which doesn’t add to the overall height of the harvester, a refrigerator in the cab and new rearview mirrors, footrests and operator seat to improve driver comfort.

Other features and improvements include:

- **‘Auto Float’ function (crop divider height control):** This function automates the control of both crop divider lift cylinders, keeping the toe in contact with the soil at all times, while also preventing ‘ploughing’. It can stop inexperienced operators from accidentally lowering the crop dividers too deep, while letting experienced operators focus more attention on other harvesting functions. Activation has been integrated into the Auto Tracker control, so no additional operator actions are needed to use the system.
- **Larger diesel fuel tank:** The tank has 29 per cent more capacity and an adjusted position within the machine to increase the number of hours in the field, reduce maintenance costs and improve serviceability.
- **Three operational video cameras:** These are now standard, positioned on the sides and lower part of the machine and able to be easily monitored on the AFS Pro700, with adjustable screens that provide easy interaction and switching of views.
- **Improved engine protection software:** This software improvement is designed to reduce the risk of engine damage due to a high cooling system temperature, and these events are now recorded to help identify issues with improper operation or inadequate maintenance.

The forerunner of today’s Austoft was conceived and developed in Australia and is now used in countries as diverse as India, China, Brazil, Sudan and Papua New Guinea.

The commitment to the Australian cane industry that resulted in the creation of that first mechanical harvester back in the 1960s is as strong today as it was all those decades ago, with Case IH investing significantly in product research and development.

“We pioneered the introduction of hydraulic systems on harvesters and continue to invest in simplifying and upgrading the efficiency of these systems,” Pete said.

“This latest Austoft combines the best of its predecessors with a raft of new features and improvements to create a machine...
that offers the most advanced solutions to the sector. For the sugarcane industry that helps contribute to ongoing strength and prosperity, and for the individual farm business a healthier bottomline through greater efficiency and overall yields.

The first shipment of the new model harvesters is due to arrive soon, ready for the 2018 cane harvesting season.

To find out more about the Case IH range of harvesters and tractors see your local Case IH dealer or visit the Case IH website at www.caseih.com

CATEGORIES OF AUTONOMY

Since the reveal of the autonomous concept vehicle, Case IH has been evolving the technology and further defining automation and autonomy as it relates to agriculture. The brand has been in discussions with customers around the world to study how this technology can be implemented for maximum benefit in their operations. Now, through its Autonomy and Automation Program, Case IH is researching and piloting autonomous technology in real-life scenarios.

“While the autonomous concept vehicle reveal in 2016 showed the world what’s possible with autonomous vehicles, it was just that – concept. This working tractor provided a platform for us to start discussions with farmers and the industry about the technology needed for High-Efficiency Farming operations today and in the future,” said Robert Zemenchik, Case IH AFS global product manager. “We’re ready to show how automation and autonomy applies across agriculture and how it can advance the precision farming solutions our customers are currently using on their farms.”

Five categories of automation for agriculture

Diverse farming operations around the world require varying levels of automation. Through extensive Customer Driven Product Design research, Case IH found that current and future technology needs fall into five categories of automation for agricultural field applications. The categories and types of activities associated with each include:

- Guidance;
- Coordination and Optimisation;
- Operator Assisted Automation;
- Supervised Autonomy; and,
- Full Autonomy.

“It’s exciting to explore the efficiencies that automation and, eventually, full autonomy can bring to each farming operation,” Robert said. “The logic behind the categories is to provide a vision of what’s possible. They are not linear, and a given fleet may even fit into more than one category at a time. Today, many of our customers are already operating in the Guidance and/or Operator Assisted Automation categories.”

The five categories defined by Case IH start with automating specific tasks on a piece of equipment. Case IH led the way by first providing producers automation technology in the 1990’s with AFS AccuGuide autoguidance, and it continues today with more advanced solutions, such as AFS AccuTurn automated headland turning technology and AFS Soil Command seedbed sensing technology.

Researching and piloting autonomous technology in the field

In 2018, Case IH is collaborating with Bolthouse Farms on an autonomous tractor pilot program. The goal of the program is to understand how new autonomous technology can be used and how it meets real-world, on-farm requirements.

“The only way to validate on-farm uses for autonomous technology is, quite literally, with field pilots where farmers use it on their own farm, integrate it into their own fleet and conduct their everyday activities,” Robert said.

As one of the largest carrot producers in North America, Bolthouse Farms is a year-round operation that farms extensive acreage across four states and Canada. The company’s focus on and openness to advanced technology, coupled with their desire to improve productivity, makes it ideal for the pilot for the Case IH Autonomy and Automation Program.

The pilot program will focus first on primary tillage and deep tillage – both highly repetitive tasks Bolthouse Farms conducts year-round – and a small fleet of autonomous Steiger Quadtrac tractors pulling a True-Tandem disk harrow or Ecolo-Tiger disk ripper will be used. This will help evaluate autonomous machine control in a variety of tillage applications, soil types, meteorological conditions and sensing and perception activities.

“One of the primary goals is to receive agronomic and operator feedback on the use of autonomous technology in real-world farm conditions so Case IH can further develop and refine our technological control and machine optimisation systems,” Robert said. “Additionally, we will be able to learn from Bolthouse Farms what uses they envision for automation and autonomy that we might not have already thought of.”

To learn more, visit caseih.com

Case IH is defining new categories of autonomy and automation in agricultural field applications.
THE old adage “one man’s trash is another man’s treasure” can be taken literally when it comes to residual material from sugar crops such as sugarcane, sweet sorghum, and sugar beets.

These crops provide sugars, molasses, syrups, and other products to sweeten our foods. But during harvest and after sugar extraction, a lot of solid plant material is left over.

Louisiana leads US sugarcane production – growing 400,000 acres or 48 per cent of total US acreage – and it produced 43 per cent of US cane sugar in 2016. Before harvest, farmers burn their fields to remove leaves, known as trash, from the stalks and make the crop easier to harvest. While some leafy trash goes back onto fields to help return nutrients to the soil, the practice of burning has been under scrutiny recently due to urban encroachment and air-quality concerns.

Another problem is bagasse, the fibrous matter left after crushing the sugarcane to extract the juice. A few mountains of excess bagasse – 30 or 40 feet high – have accumulated over decades, towering outside of factories. Waste particles from these piles of bagasse become airborne in windy conditions, affecting air quality, says Isabel Lima, a chemist at the Agricultural Research Service’s (ARS) Southern Regional Research Center (SRRC) in New Orleans, Louisiana. Bagasse also occupies several acres per site, which is a waste of valuable land – as well as an eyesore.

Enhancing sugar crop value for farmers is one goal of SRRC scientists. They develop commercially viable technologies that boost growth and profitability, converting crops into sugar, biofuel, and bioproducts and improving postharvest quality and processing.

**Making bagasse into biochar**

Recent work of SRRC’s Commodity Utilization Research Unit includes transforming sugarcane and sorghum leafy trash and bagasse into biochar for fuel.

ARS scientists are finding uses for the solid plant waste that remains after sugarcane harvest and sugar extraction. (PHOTO: Isabel Lima)

Louisiana sugarcane factories annually process close to 14 million tons of sugarcane into 1.5 million tons of crystallised raw sugar, which is then sent to refineries. While all of the state’s 11 factories use bagasse as a fuel source for processing sugarcane, about 15 to 20 per cent of bagasse is left unused at some factories after energy needs are met.

“Both bagasse and leafy trash are untapped resources that can be made into biochar, a carbon-rich charcoal. Biochar can be used as a soil amendment to enhance soil health and water-holding capacity and to improve sugarcane yields,” Isabel says.

Biochar is made from biomass (plant material) using a process called pyrolysis, a chemical decomposition of organic material through heat application.

In a recent study, Isabel amended soil with biochar made from sugarcane leafy trash and bagasse. She found that sugarcane stalk and sugar yields were consistently higher from the amended plots than from plots with no biochar added.

“Biochar contributes needed nutrients to sugarcane and builds soil carbon,” Isabel says. “It increases soil pH and plant macronutrients as well as soil fertility.”

**Formulating the best biochar**

As an alternative to burning leafy trash in the field, Isabel is looking at advantages and disadvantages of bringing most of the leafy trash into the factory along with the sugarcane stalks, which are cut into segments called billets to facilitate processing.

Producers could adjust harvesting equipment to gather most...
of the leafy trash with the billets while allowing enough trash back onto the field to nourish and protect the soil for next year’s crop, Isabel says. The billets and remaining trash would then be separated at the factory.

In one experiment at a sugarcane factory, Isabel used a detrasher unit to separate leafy trash from billets before processing, and then they added the trash to the bagasse.

Having this detrasher unit allowed two waste materials, leafy trash and bagasse, to be converted into biochar at a torrefication plant built at the factory, Isabel says. Torrefication refers to pyrolysis at lower temperatures. The process changes biomass properties, creating a product (biochar) that is easy to handle and transport.

One outcome of the experiment was introduction of less trash into sugar processing, Isabel says. “We determined that if a significant amount of the impurities — soils, green leaves, brown leaves, plant tops — are removed before production, processing is much more efficient and less costly.”

**Removing heavy metals from water**

Isabel also has found that biochar made from sugarcane residues can serve as a reliable and consistent product for removing heavy metals from surface waters, improving water quality.

In one study, Isabel worked with West Virginia State University colleagues to collect fresh cane, leafy trash, and bagasse at different processing stages from different sugar factories. They experimented with the collected materials and with pyrolysis protocols to find out which regimen would produce the best biochar to remediate two heavy metals — cadmium and copper.

“We found that aged or older bagasse actually has better properties for producing biochar for remediating heavy metals,” she says. “It shows there’s a beautiful use for that old bagasse that’s been sitting outside mills for decades.”

**Converting sorghum bagasse into animal bedding**

ARS scientists are finding value-added uses for other sugar crops, such as sweet sorghum, a crop that has characteristics similar to sugarcane but has different chemical properties, Isabel says.

Sweet sorghum is processed into syrup, not sugar, and can also be used as a biofuel feedstock. Some sugarcane farmers grow it during off season and harvest it before planting sugarcane.

Less total bagasse is produced from sorghum than from sugarcane because there are fewer sweet sorghum producers, says SRRC microbiologist Maureen Wright. Much of the sweet sorghum bagasse goes back on the field to help nourish future harvests. But some farmers are looking for a more profitable use for it.

Recently, SRRC scientists worked with a sorghum producer in Germantown, Tennessee, who wanted to use bagasse for horse bedding, which is used to absorb animal waste on the ground. But first the bagasse had to be treated with a process called ensiling to keep it from spoiling.

“The producer had tried previously to ensile the bagasse, but his experiments weren’t successful,” Maureen says. “He asked if we could try to get it to ensile in the laboratory, so he could then scale it back up to his larger operation.”

Ensiling entails compacting the material, wrapping it in plastic or another impermeable barrier, which forces microbes (in the soil and on the plant) to produce compounds that drop the pH to a point where they can no longer live, Maureen says.

“That’s beneficial, because when no microbes can grow in the bagasse anymore, the product stabilises and can be used for other purposes,” she adds.

Maureen and her team traveled to Tennessee. As the producer and his crew crushed sorghum stalks to collect juice, the SRRC team used an industrial trash compactor to compact the bagasse into small bales. The bales were then wrapped in thick plastic bags to allow ensiling. Half of the bales remained with the producer in Tennessee and the other half were transported to SRRC for observation.

“In the process, we found that the vibration of the pickup truck loosened them enough to allow oxygen to get in and microbes to continue growing, preventing ensiling; whereas, the producer’s bales that remained stationary were ensiling perfectly,” Maureen says.

In a follow-up experiment, scientists wrapped heavy-duty tape tightly around the plastic before transporting the bales. These bales stabilised and ensiled.

“We found you can ensile bagasse and stabilise it for other uses,” Maureen says. A producer only needs bags thick enough to keep oxygen out. But if bales are going to be transported, they should be wrapped tightly so the motion won’t allow oxygen to enter, she adds.

In other studies, Thomas Klasson, SRRC’s Commodity Utilization Research Unit research leader, is looking at uses for sweet sorghum and sugar beet syrups. Sweet sorghum sugars have been used as sources for butanol production in the past, but studies usually focus on sweet sorghum juice rather than syrup.

“We are investigating sorghum syrups as feedstock and trying to improve the fermentation process for ethanol,” Klasson says. “It appears that the sugars in the syrups are useful for biofuel production, but in some cases the syrups must be augmented with additional nutrients for optimal fermentation.” Thus, the economics for biofuels are not seen as currently favorable.
The eccentric Bulldogs

Frankly, I have absolutely no idea how many times I have embraced the subject of Bulldog tractors within the pages of my books and magazine articles. The main persuasive reason for so doing is that of all the tractors about which I have written, Bulldogs unequivocally have attracted the greatest interest. The same can be said when a Bulldog performs its thumping and jumping at a classic tractor field day. The spectators abandon the Fordsons, John Deeres, Chamberlains, and so on in favour of crowding around the idiosyncratic and highly entertaining Bulldogs.

Plus, I have to be perfectly honest, I too have a soft spot for these weird hunks of hardware, having experienced over six (yes six) decades of fascinating involvement with them.

In order not to complicate things, it is important to note that there were actually two manufacturers of Bulldog tractors offered to Aussie farmers. The original (and some say the best – including me) were those manufactured by Heinrich Lanz A.G. of Mannheim, Germany. But during and for some years following World War 2, the importation of these Deutschland machines was temporarily terminated for obvious reasons, not the least of which was the destruction of the Mannheim plant, courtesy the US Airforce.

The principal importer of Lanz tractors prior to the outbreak of hostilities, was the Victorian firm of Kelly and Lewis Ltd. Armed with technical drawings and spare parts samples, they decided to produce a near identical replica of the Mannheim original. The KL board foresaw an excellent marketing opportunity during the postwar shortage of imported tractors. Accordingly, KL Bulldogs finally entered the tractor market in 1949, three years behind schedule, on account of planning and development frustrations, of burlesque proportions.

The Chief Design Engineer Alios Murr suffered hours of frustration, arguing with management over cost issues which he claimed were jeopardising the integrity of the design. He referred to such matters as the inadequate thickness of the piston surface, the failure to heat-treat the crankshaft, the poorly constructed fuel tank, and so forth. In the end he resigned in disgust.

Thankfully the majority of the perceived weaknesses were addressed prior to the release of the product.

My initiation

During a sweltering hot afternoon in late 1954, I was astride my Indian Big Chief motorcycle, complete with sidecar, into which were crammed all my worldly possessions, including Suzie my wee doggie mate. I hadn’t sighted another vehicle for over an hour. Not surprising really – the Rowena to Burren Junction Road, even today, is not noted for its traffic jams.

I had just resigned from the job of a Windmill Assembler’s Mate. Trying to bolt together a 100 foot tower, out in the hot arid New South Wales Western Plains with the temperature 110 in the waterbag, had suddenly lost its appeal. So Suzie and I were heading to Narrabri in the hope of obtaining a casual job as a tractor driver which, although would not pay as much as a Windmill Assembler’s Mate, would undoubtedly increase my chances of one day achieving old age!

Then it happened! The rear tyre of the Indian punctured. With a groan I rolled the big machine to a stop and switched off the ignition. Silence, apart from the ticking of the cooling exhaust pipe. But not for long! Accompanied by a cloud of dust, an
Austin A70 ute pulled up behind me. A long gangly chap, his features hidden in the shadow of a large Chips Rafferty style hat, climbed out from behind the wheel.

“Ye orright mate?” he inquired.

His name was Trevor Ward and he was a share farmer returning to Narrabri from a machinery sale at Collarenebri. His offer of assistance was gratefully accepted. An hour later, with sweat pouring from each of us, the offending tyre was repaired. But significantly, Trevor was seeking to employ a tractor driver and had a spare room in his Narrabri home, which for 15 shillings a week, including keep, would be mine during the next few months, should I accept his offer of a job.

The following morning, having breakfasted with Trevor and his charming wife, I was taken in the A70 a few miles out of Narrabri on the Maules Creek Road to the 800 acre grain farm, where Trevor carried out his share farming.

Despite my (then) tender years, I can somewhat egotistically state that I was an experienced and proficient tractor operator, having been working tractors of numerous makes and sizes since my schoolboy years in Scotland and as a casual tractor driver on various farms throughout NSW. But for some reason I had never come face to face with a Bulldog.

Accordingly, when Trevor introduced me to his KL Bulldog I was frankly perplexed. When I was urged to mount the thing and start the engine, I experienced a feeling of total inadequacy. During the journey to the farm in the Austin, I had boasted of my tractor talents, and here I now was faced with a tractor about which I simply hadn’t a clue!

Where was the starter button, or alternatively the crank handle? Why on earth did it feature an exhaust pipe resembling a 44 gallon drum? What was that lump sticking out from the front? What was the idea of the unconventional side mounted radiator? I was about to have all these questions answered.

I watched wide eyed with amazement as Trevor clambered up into the driver’s cockpit, reached down and pressed a lever enabling him to extract not only the steering wheel, but also the steering shaft, which was obviously heavy. He then managed to lug the apparatus from the tractor and carry it to the offside, where he inserted the shaft into a fitting in the centre of a giant flywheel.

By now it had dawned upon my little grey cells that the Bulldog was powered by a massive two stroke valveless single cylinder horizontal semi-diesel engine, with the cylinder head pointing north. Hence the flywheel located mid ships along the side.

Trevor next proceeded to open a cupboard located on the side of the bonnet from which he extracted a gargantuan blowlamp. This he placed on a bare patch of ground, undid a bung and casually slopped petrol into the tank and also into a tray located below the actual nozzle. I was then instructed to stand clear, while Trevor produced a box of Red Heads, struck a match and tossed it at the blowlamp. WHOOSH, a conflagration!

At this stage I was starting to question Trevor’s sanity.

As the flames started to settle, with asbestos gloved hands Trevor grasped the blowlamp and with its inbuilt primer pump, pressured the petrol in the tank until eventually a hissing blue flame emerged from the nozzle. The somewhat alarming apparatus was then attached to a bracket located just in front of the cylinder head under what I was to learn was a hot bulb, which would eventually turn ‘cherry red’ I was assured. This was an essential component of the starting procedure as the hot bulb served to preheat the combustion chamber. I just shook my head in bewilderment.

But we were not finished. Trevor grasped a tool similar to an
old fashioned brace and bit. But where the bit would have been there was a tip like a screwdriver. He then knelt down beside the nearside of the KL and engaged the tool in a slot, which he indicated was part of the engine lubricating pump. It was necessary to wind the brace two hundred rotations. By so doing the internals of the big single cylinder engine would be awash with oil. I could certainly appreciate the benefits of that.

It occurred to me at this stage that the International W6 I had been driving the previous month, only required the touch of a button to fire up the engine!

But Trevor had not yet finished the task of preparing the tractor ready for starting. There were numerous grease nipples waiting to have yucky grease pumped into them, some of which were located in hidden recesses under the tractor. Then, the grease gun ran out of grease, required refilling. Possibly the very worst job on the farm – in my estimation at any rate. This was before the era of grease cartridges.

Trevor inspected the hot bulb which, thanks to the sterling effort of the roaring blowlamp, was now the necessary cherry red giving me the impression it would soon start to melt! (Why cherry red and not er, tomato red)?

Following his announcement that “We are now ready”, he walked round to the offside of the tractor, gave the fuel priming pump lever a couple of pumps, (crude oil fuel), before grasping the protruding afore mentioned steering wheel. With feet well planted for stability, Trevor swung the wheel back and forward with a pendulum motion. It was obviously hard work. Suddenly (and I mean suddenly) there was a BANG followed by series of grumbling detonations, as the big engine burst into life. All good? No! The engine cycle was running backwards! (Gee, what next)? Trevor cut off the fuel at the priming pump, until the engine slowed to a halt. Fortunately he had not removed the belching blowlamp from its bracket. So the hot bulb was still hot. Grasp the steering wheel again and restart the pendulum action. BANG. This time the engine behaved itself and ran in a forward rotation. The blowlamp was removed.

My six decades of association with Bulldogs had commenced.

In conclusion

For the record, a few months following my experiences with Trevor Ward I was invited to join the staff of Lanz Australia Pty Ltd as their sales representative for the state of NSW. This was indeed a challenging appointment as I had just turned 21 years of age. But I enjoyed immensely taking off at the beginning of each month in my company car with a boot full of Lanz Bulldog pamphlets, calling on country dealers, assisting them with demonstrations plus often helping them with the closing of sales. I especially looked forward to organising field days and attending country shows, before then returning to the Lanz HQ in Sydney towards the end of the month and being enthusiastically greeted by the friendly German staff. Great days!

In later years I have purchased numerous Bulldog tractors (now historic classics) and together with my wife Margery, have lovingly restored them to brand new condition. We have visited the Mannheim factory, now under the control of my once arch rival, John Deere, and shared Bulldog experiences with some of their older staff members.

There is no doubt these tractors were idiosyncratic, but they certainly reeked of character and their reliability is now legendary among tractor collectors around the world.

Yes, the Bulldogs were weird, but clever!
May is here already and this has been one of the wettest starts we have had for a long time. In Mossman the wet season has been one of the wettest in around 15 years. The northern crop has generally handled the wet start pretty well but there are early reports of some major erosion damage in the district.

In the first three months of this year, the Mossman region received around 2929 mm of rain. The January total for 2018 was 583 mm, February – 1108 mm and the March – 1238 mm. With the recent rain and at times wild winds, small areas of lodged cane have appeared. These areas are isolated and I expect it to have a minimal effect on the 2018 crop.

With the cyclone season drawing to an end and a relatively normal summer, the crops in all the northern areas are looking like an average season.

The estimate for the Mossman Mill is now in – the crop is estimated at 1,152,000 tonnes to be crushed in around 23 weeks. Around 300,000 tonnes is to be Toll crushed by the Tableland Mill and around 850,000 tonnes to be crushed by Mossman Mill. The proposed start date for both mills is June 4, 2018.

Local farmers are also eager for some dry weather so they can start their planting programs. To date there has not been any early planting carried out. Growers are reminded that before planting they should contact their local Productivity Board for a plant source inspection. For an accurate reading you have to allow a few weeks for the results, so please give your field officer plenty of notice.

In March the Cane Changer team were in Mossman hosting a BBQ at Sweet Farm Tours to promote the Cane Changer program. More than 30 farmers from around the district attend the event which was run in partnership with representatives from ACFA, Canegrowers, Next Gen and the Wet Tropics Sugar Industry Partnership (WTSSIP).

The discussion focused on the future of the Mossman Mill and potential implications any changes could have for farmers. Farmers were encouraged to share their views and throw around some ideas on moving forward.

I would like to congratulate the winners of the Mossman Mill Productivity Awards:

- Best Productivity in each zone 2017:
  - Daintree – Colin McDowell.
  - Bamboo, Syndicate and Whyanbeel – D’Addona Farming and Electrical.
  - Miallo – D’Addona Farming and Electrical.
  - Shannonvale and Cassowary – John Padovan.
  - Mossman – W Denk.
  - Mowbray – C Fasano and Co.
  - Julatten – PJ and MA Verri.
  - Atherton and Tolga – B and G Wieland.
  - Canegrowing Excellence Award – D’ Addona Farming and Electrical.
  - Best Five-year Average Producer – Warland Brothers.
  - Young Grower Award – Gerard Puglisi.
  - Best Presented Farm – D’ Addona Farming and Electrical.
  - In Appreciation for on-farm Research – C Fasano and Co.
  - Harvesting Award – Padovan Harvesting.
  - Growers Long Service Award – Tano Caltabiano.

Gerard Puglisi
Northern Region Director
May 8, 2018
I hope everyone had a well-deserved Easter break that may or may not have involved large amounts of chocolate and other treats to help maintain the global sugar consumption.

Mill employees have been busily repairing the mills despite a difficult end to the 2017 season and local hearsay that funding has been reduced from previous years. Mill upgrades include:

**Mulgrave Mill**
- Cane receivals/weighbridge PLC upgrade.
- New NIR instrument initiated for cane pay.
- No 7 boiler superheater replacement.
- 175 new six-tonne cane bins.
- New cane rail and bridges works program.
- 25 tonne Franna crane purchase.

**South Johnstone Mill**
- Computerised maintenance management system.
- Boiler three chimney replacement.
- Root cause of identified No 5 Mill failure and work undertaken to upgrade to operate to capacity with new PLC control.
- Replacement of Calleja’s Rail Bridge.
- Girder replacement of Russo’s Bridge.
- Upgrade of locomotive sanding/service area.
- Safety upgrades including isolations, guarding and cladding.

A number of harvesting groups are expanding their haulage fleets of bins to coincide with the mills upgrading to six tonne bins, and all are preparing their existing equipment for the new season.

Low sugar prices are weighing on minds everywhere with the high dollar exacerbating the reduced prices. Personal plans to budget for lower income will lead to a cut in farm expenditure and the potential future of the crops.

Tropical Cyclone Nora dumped consistently heavy downpours along the North East before Easter. The gulf got the wind but we got the rain – a total 1345 mm for March with a highest daily of 193.2 mm. The monthly total was thanks to both Nora later in the month and another downpour earlier in the month which caused widespread flooding over the entire North Johnstone river system from the Tablelands to Ingham. Supermarkets were empty until Woolworth organised a barge to deliver 350 tonnes of essential supplies to Cairns.

The flooding has caused two issues:
- Although the majority of the crop has recovered reasonably well, some farms have reported crop losses of 30 per cent with some lower lying fields reaching 50 per cent because of waterlogging.
- The mill’s and harvester companies have had their repair timeline delayed due to road blockages and inability to work in the wet weather.

At the time or writing, Tropical Cyclone Iris remains a low in the Coral Sea after traveling up and down the coast to Mackay twice now. Historically we are nearing the end of cyclone season so hopefully Iris will be the last for the year.

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**HERBERT**

The month of March saw extreme weather conditions with excessive rainfall from Cyclone Nora and then Iris. Ingham was inundated with floodwater and the outlying areas cut off from town for more than a week.

In between the second weather event with more rain falling we managed to attend the Next Gen Conference held in Mackay. There were around 200 people who were going to attend but owing to the flooding rains a few people couldn’t make it. Those who attended thought it was the best Conference they had been to. The presentations from the guest speakers were thought provoking and innovative. The gala dinner was enjoyed by all.

Ingham flooded for the second time and some of those travelling North had to stop in Townsville until the road cleared.

On a more serious note, farmers are bearing the brunt of what Cyclones Nora and Iris dumped on Ingham. Road damage, paddock and cane damage, river bank damage and so on. The full extent of the damage is still emerging and being assessed. A very trying time especially with low world prices to contend with as well. This year looks like being one we wish to forget.

I urge all those farmers with damage to make an appointment with our QRIDA representative in the north – Sam Spina.

We are all complaining about the mosquitoes around the district. At one stage we couldn’t buy mosquito coils. Now we are seeing some mosquito borne diseases as a result of the excessive rains.

Feral pigs are around, crocodiles on headlands, rats are prevalent and the cockatoos are now moving in for their chop at the cane. What else is new? Farmers are always the front-line fighters and, as always, never getting the credit they deserve.

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**BURDEKIN**

Wilmar Sugar has announced a season start date of June 12 for its Burdekin, Herbert and Sarina mills.

The Proserpine Mill will start crushing a week later on June 19.

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Michael Camilleri  
Northern Director  
May 8, 2018

Carol Mackee  
ACFA Herbert Director  
May 8, 2018
General Manager Cane Supply and Grower Relations Paul Giordani, said the start dates were based on a pre-season crop estimate of 16.22 million tonnes across Wilmar’s four milling regions. “This is a slight increase on last year’s total of 15.76 million tonnes, due to good recovery in cyclone-affected crops in the Proserpine and Sarina regions,” Paul said.

“It can also be attributed to exceptional plant crops and good early cut crops in the Burdekin region.”

Paul said estimates for the Herbert region were down on last year’s bumper crop. “Wilmar’s Herbert mills crushed more than 5 million tonnes in 2017 for only the fourth time in history. This year’s crop was shaping up to be a similar size until the region was impacted by flooding in March.”

Regional crop estimates are:
- Burdekin – 8.46 million tonnes.
- Herbert – 4.77 million tonnes.
- Proserpine – 1.76 million tonnes.
- Plane Creek, Sarina – 1.23 million tonnes.

Paul said Wilmar had consulted with grower representative groups in April about crop estimates, start dates and projected finish dates.

Wilmar Sugar is planning to run a series of mill tours and information sessions from early May to show cane growers some of the capital and maintenance work being completed ahead of the 2018 crush.

Wilmar’s AgServices Team is planning to run information sessions for Proserpine and Mackay region cane growers about the benefits of using Bio Dunder liquid fertiliser in their farming operations.

Agribusiness Agronomist Damian Baxter said the six presentations would include an overview of Wilmar’s Bio Dunder product range, an update on research and development and the latest on Bio Dunder farm trials. Bio Dunder is a co-product of Wilmar’s BioEthanol Distillery at Sarina, where molasses from Wilmar’s Plane Creek, Proserpine and Burdekin sugar mills is processed into ethanol. Wilmar AgServices has developed the Bio Dunder range of liquid fertilisers to ensure there are products to suit a wide range of farming applications.

Compiled by the Editor
Drawn with thanks from news releases featured on Wilmar Sugar Australia’s media centre
May 8, 2018

The wet season eventually improved from February to the beginning of April. The rain events in general have been effective rainfall events. The crop at this stage has been estimated at 4.8–5 million tonnes of cane. The crop has been affected by seven months of moisture deficit during the current growing season.

Cyclone Iris passed by after Easter. No damage as was recorded as was the case with Cyclone Debbie last year. Winds with waterlogged fields has lodged some cane. It was the first major rain event which allowed on farm water storages to be filled.

When the rain finally arrived at the end of January, the crop then showed great effects of YCS. This hindered the recovery after the dry and it needed to grow out to take advantage of the growing conditions. Research into identifying the problem has observed an insect which could lead to progressing the solution. The stress factors from weather conditions which occur in the Herbert River and Central Districts also seem to be a contributing factor.

Weather

The long, involved cyclone activity has resulted in the usual – “if it’s pouring up North, it’s drying out in the Wide Bay”. Most people were keen to irrigate, but closer to the coast, the stronger and more persistent are the South Easterlies. More flood and trickle has been set up even this late in the growing season.

Booms are booming. Perhaps as a side line I should go into pipes sales?

Solar and other forms of energy supply are always in the tech articles and irrigators will have to add this knowledge stream into their workday to, perhaps, keep the cost down. None of the published media in our Region gives any hope for a direct price reduction.

Perhaps a lesson from the fast food industry is worth noting. Along the highway I notice one of the diners came up with the $5 breakfast. The other joints had to follow suit or everyone simply walked. How does this work? Is bacon cheaper at their end of the street? Don’t know, but it was the fastest thing to happen in a long time in this ‘one horse’ town.

Harvesting

A new flyer at the recent Next Gen meeting showed the Canetec chopper harvester. Now this is interesting. A Bundaberg product. Efficiency is the buzz word. So far, all operations show this machine can do the same job using less inputs. As usual, if we can’t control the price, we must control the cost. From conversations with the builders, this is what the new machine is built to do. As a bit of humour, it’s the proper colour too.

A recent morning drive through of the Rocky Point area has the crop at varying stages of growth. It will take a bit of planning to get the most out of what they’ve got. I am planning to get around there and see how 2018 is shaping. I realise the urban sprawl problem and the dollars side of that, but, there is
some good paddocks and an old word ‘equable’ climate. I am reminded there are worse places.

Isis Mill has got a grip on the Walliville new rail project and after some wild rumours and the knockers factory has settled down it must surely happen. One story from a conversation with an engineering sales rep was that even ground where Bjelke Joh grew peanuts is going under sugarcane!

**Next Gen**

If you missed Next Gen, you really missed something special. Please look it up and chase up the presentations and the presenters. All those involved had no hesitation in saying “I will be there next time!” Why? Because you won’t find so much good oil in a week’s march. Make sure you just do it next time!

**NEW SOUTH WALES**

The NSW crop will not be a record by any means, although it will be respectable at each mill. No one really knows at this time of the year but the projections are for 670,000 tonnes at Harwood, 700,000 Broadwater and 480,000 at Condong, with the possibility of some cane coming from Rocky point in Southern Queensland to be crushed at Condong.

The wet November/December harvest has not helped the late ratoons that were cut in the wet – the rain continued through the early growth and much of this cane has been setback badly.

**Soybean crops**

While some will harvest well, there has been enough adverse weather to ensure that they will not put the dollars in grower’s pockets that they have in many other years.

**Growth of the cane**

Those who measure growth of their cane on a weekly basis have had some surprises with growth being measured at around two cm per day during March. I would suspect that this could slow dramatically now we have lower night time temperatures but should help with the building of sugar in the crop.

Just over 12 months ago Tweed experienced the largest flood since European settlement in the valley all crops were totally submerged for a time. Today I checked the flood level marks and some of the year-old cane would have been showing if a similar flood height was present today. Never count your tonnage until it is in the mill, but much of the Tweed crop looks OK!

**Drainage**

There is a need to improve drainage especially, in the low lying areas of the three mill zones. This is now being worked on by NSW Cane Growers Council and Local Governments in the cane growing areas. The aim is to cut the red tape that is slowing the cleaning of drains from the flood gates to the river.

Last week another layer of control came over many of these drains through the coastal wetlands policy mapping – these maps appear to cover an area about 400 metres each side from the main river and some of the internal channels on farm land. I am unsure if this will allow existing use in the new zones – if not, life could become very difficult for many of us farming close to the rivers which is, by its very nature, our most productive alluvial country.

In January this year I was fortunate to be able to attend Bansuri week in Nicaragua. While there, I was able to talk with growers from Central and South America. In particular the growers from Brazil are doing it tough. Like us, they are not subsidised and sell on the global market.

Mills are closing in Brazil but they are still one of the price setters for sugar globally. This year our colleagues in Queensland – with rising electricity prices and the cost of irrigation water – will struggle to cover their cost of production.

Is NSW the place to invest in sugar cane? NSW has one of the lowest costs of production in the world – and I think I can speak with some authority on this after visiting over 30 sugar cane growing countries – we have one of the highest levels of sugar tonnes per hectare for rain fed cane in the world. If anyone is thinking of investing in sugar cane growing

NSW has to be the place. The returns on investment are very good. With our Bonsucro certification, we were the first group in the world to have all our production at the three mills certified from the farm to the shelf. The innovation at mill level which includes low GI sugar most certainly makes us a leader for the world.

The answer to the question I put above is a resounding yes!

**Mike Hetherington**

ACFA Southern Region Director

May 8, 2018

**Robert Quirk**

ACFA New South Wales Director

May 8, 2018

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April–May 2018
Of wind and rain and bloody games!

By Phil Jackson – Fly, Tye and Tackle

T’S raining, or more correctly it’s still raining – from memory it did this last year as well. In fact when I cast my mind back over the past six and a half decades of living memory getting wet at Easter was as predictable as a forgotten political promise.

I avoid the waterways and boat ramps at this time of year for that very reason. The once-a-year anglers and would be mariners dust off the tinny and make life difficult for everybody.

Easter for me revolves around early morning and late afternoon walks along the tree line, casting an eye over mobs of deer, culling the poor genetics and filling the freezer. Fawning last year went well and many of the does carried twins and combined with this past year’s particularly good early rain and good growing conditions, survival rates have been high.

A rising tide raises all ships, as the saying goes, and the cattle have responded in kind – there’s no such thing as a beast in poor condition and, like the deer, most have young at heel.

The down side is feral dog numbers have increased to meet supply so our trapping efforts have increased accordingly. I wish local authorities took the issue seriously and made bounties worthwhile, at least to cover expenses.

The wind and rain

Meanwhile, you’ll probably recall, Cyclone Linda cracked a major tizzy fit and swept through the north, reaping heartache and havoc. My in-laws in Ingham have been spending their boat time surveying the damage and making house calls instead of fishing.

Naturally this is a major concern in the southeast – or until something like the games comes along and then it’s all just yesterday’s news and, as long as latte prices don’t change, all’s well.

The chain stores are also big supporters of regional productivity by “sourcing products from alternate suppliers so consumers won’t be disadvantaged” and life will go on.

The games

In theory I support the idea of the Commonwealth Games as much as the next person. I know the sales pitch and, theoretically, the games will bring a financial boom to the state and showcase our potential – yarda, yarda, yarda.

But I can’t see the sense on spending the housekeeping on a party when there’s repairs to be done. The cost of that pathetic opening ceremony alone would have gone a long way in flood relief and getting infrastructure back on track.

Come to think of it, where does all the money go? The states infrastructure is a mess, the hospitals and emergency services are begging for funds, correctional facilities are crowded to the point of melting down and we have a party instead? I know the bid for the games was made years ago and
has been planned and budgeted for. So that proves it’s possible. So why can’t someone plan and budget for stuff that really matters?

And to make matters worse the fishing’s stuffed!

The effects on fisheries of cyclones like Linda are obvious in the short term. But the long-term effects are with us for decades – when we have an annual cyclone – or ‘extreme weather event’ if you watch CNN – the recovery process never really gets completed.

I first got involved in the sediment and nutrient monitoring programs in Queensland waters back in 1983 – all the correlated data shows that the marine environment is capable of natural repair and renewal if it gets the chance and if the window for natural cleansing is open long enough.

Cyclones are a natural and necessary event. Rivers get rerouted to create new flood plains and expand
People, especially greenies, have to realise that not every wild creature is the reincarnation of an ‘all knowing’ god! Critters die in storms and cyclones because they’re old, infirm, too weak or too stupid to survive. Sometimes the gene pool needs to be scrubbed out.

Having said that, nature does help. Have you noticed none of the apex creatures, like wales and so on migrate at the times of year when there’s a likelihood of extreme weather events?

**The fishing**

Meanwhile, I need a feed of fresh fish, so where do I go?

The creeks and rivers are running a banker and the turbid water is virtually fresh. Table species like whiting (*Sillago ciliath*) have an extremely low tolerance to fresh water, but the ubiquitous bream (*Acanthopagrus australis*) along with all the flathead species can survive in the freshest of water so they won’t go far – I just have to find them.

Back to the vital signs, deductive reasoning and applied logic.

The prevailing currents are southerly so any outpouring from the creeks and rivers will be swept north. This should leave the southerly side of the outpouring relatively clean, or at least within the tolerance range of most table species.

If there’s a rock groyne of headland at the river mouth there will be clear water trapped inshore of the outpouring. This will be your best bet because any crustacean or invertebrate swept out by the floodwater will be carried northwards and will attempt to get back to the shallow clear water along the beach.

A bait jig or cast net will get you all the bait you need. This is the place to catch big mulloway and barramundi on live baits and big plastic jigs. Plastics work well, especially if they have lots of attention getting wobbly bits like squid.

Off shore the plume of the outpouring will show as a distinct colour line between turbid floodwater and the clean salt water. Trolling this colour line with surface, mid and deep water lures will be productive.

In the rivers and creeks, the tide will still come in even though the floodwater is running out – the fresh will be on the top and the clean salt water underneath.

Bream, flathead, mulloway and barra will come in on the flooding tide so fish deep with live baits and big fifteen to twenty centimeter plastics. I’d fish dark lures here like bronze, orange and lime green would be a good starting point.

Words of warning. Crocs, bull and whaler sharks will be in these locations for the same reason you are, so don’t wade too deep, swim or spear fish. Remember you’re part of the gene pool and we know what happens to the dumb ones!

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**ANSWER TO IAN’S MYSTERY TRACTOR QUIZ**

The mystery tractor is a 1954 Lanz Bulldog D1706 equipped with a Bosch pendulum starter motor and a powered down thrust three point linkage, both fitted as standard. Restored by the author.