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Sugar Research
Australia

CaneConnection

Spring edition

Issue 1 | 2013

Welcome to the first edition of CaneConnection

Dr Andrew Ward

Executive Manager
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Communication Unit

With the formation of Sugar Research Australia (SRA) I am pleased to launch CaneConnection, our new quarterly grower-focused technical publication.

The Professional Extension and Communication Unit has spent a great deal of time this year out-and-about, and talking to you and the industry that supports you.

We've heard from every cane-growing region that you want to know about relevant information that could help you boost production and profitability on your farm.

And you want this information to be timely and topical.

In this edition we cover a variety of seasonally relevant issues as well as an update on our work into understanding Yellow Canopy Syndrome.

With sugar prices down, we focus on a range of areas that have the potential to minimise costs without reducing yields. Firstly, we look at pump efficiency, a potential source of savings with electricity costs continuing to rise. Secondly, we look at the impact of row spacing on yield and production costs, and finally we look at the important issue of optimising fertiliser inputs.

We also spend some time looking at diseases in plant cane as well as the management of rats. Finally, we discuss red witchweed, a recently discovered biosecurity threat to sugarcane and other crops in the Mackay area.

As this edition reaches you, I hope that the crush will continue seamlessly and that your yields and CCS levels will meet or exceed your expectations.

I trust that *CaneConnection* and the other informative publications we have planned for the rest of 2013 will meet your needs.

We value your input. If you have any suggestions about topics that you would like to see covered in future editions or have any suggestions on how we can improve this or any of our other publications, please let me know by emailing communications@sugarresearch.com.au

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Yellow Canopy Syndrome update



Davey Olsen

Project Leader

Solving the Yellow Canopy Syndrome research project

In each edition of CaneConnection we will update you on our progress in understanding Yellow Canopy Syndrome (YCS).

SRA is leading the Solving the Yellow Canopy Syndrome research project, which is funded by the Sugar Research Development Corporation, the Department of Agriculture, Fisheries and Forestry Queensland (DAFFQ) and BSES.

With our project partners – **Burdekin Productivity Services Limited (BPS)**, **Herbert Cane Productivity Services Limited (HCPSL)** and **DAFFQ** – we have made good progress in ruling out some possible causes and setting up new trials to learn more.

Transmission via planting material

We know that growers in affected areas are concerned about the possible use of YCS-affected planting material due to its potential impact on future crops.

To address this concern, we set up a trial – under optimal conditions –

After 10 weeks we did not see YCS symptoms expressed in the young cane, even when the plant source was severely affected. Germination was impaired, however, with reductions of up to 20 per cent when severely YCS-affected plant source was used.

Two new trials now underway

to see if YCS could be transmitted via planting material.

A water stress treatment has now been introduced to the trial. After a few weeks of this treatment we have seen some typical stress-related yellowing – but nothing resembling YCS symptoms.

We will continue to monitor this trial to see how the cane progresses under these conditions.

Observation trials

Within the Burdekin and Herbert cane-growing regions, a number of sites will be monitored regularly to track the development of the symptoms of YCS in two successive crops (plant crop and first ratoon, or a first and second ratoon).

With BPS and HCPSL we have identified and begun establishing these sites in the field. Soil sampling has started and data is being collected to assist with mapping and cataloguing site history and inputs.

BPS and HCPSL are also helping us assess the industry impacts of YCS on this year's yield and sugar. This data is being collected and YCS-affected blocks are being monitored through to the mill.

Trial one: Planting material and the impact of stress

Based at our Burdekin facility, this recently planted trial seeks to understand how water stress and Imidacloprid treatments impact on clean and affected cane.

Scientific Reference Panel now on board

This project is supported by an independent Scientific Reference Panel that is responsible for providing scientific opinion on the direction of the project.

The panel includes:

- > Professor John Lovett, Plant Biosecurity Cooperative Research Centre (PBCRC)
- > Dr Andre Drenth, The University of Queensland
- > Dr Geoff Inman-Bamber, Crop Science Consulting

In mid-August the panel travelled to the Burdekin and Herbert cane-growing regions and met with the SRA project team and industry representatives.

The panel reviewed all aspects of the project and toured both regions to assess first-hand YCS in the field. Once we receive the panel's report and recommendations, the SRA project team will meet to consider their input and adjust the project as required.

Trial two: Imidacloprid

Field trials have been established in the Herbert cane-growing region in collaboration with HCPSL to investigate the effects of Imidacloprid on YCS expression and severity.

Efficient pumps: keeping your costs down



Marian Davis

Development Officer - Irrigation
Professional Extension and
Communication Unit

As irrigation commences on plant and ratoon cane, it is a good time to consider the actual cost of applying that water. Poorly performing pumps could be adding substantially to your bill.

Knowing how much a pump costs to run and how efficiently it is pumping makes it easier to decide what to change. Replacing a pump is a significant investment, but poorly performing pumps could be costing more to run than the cost of replacement.

Irrigation management has traditionally focused on water use efficiency; that is, applying the right amount of water in the right place at the right time. However, the Rural Water Use Efficiency (RWUE) program found that one

of the major impediments to good irrigation efficiency was poor pump performance.

Pumping costs are a major component of irrigation costs and energy use, with costs of over \$120 per megalitre being recorded (Jessen, 2011). Pump evaluations conducted in the Burdekin in 2011 calculated that for an energy cost of \$0.20/kWh, pumping costs were between \$8 and \$23 per megalitre (see Table 1).

With energy costs constantly increasing, growers should be assessing their systems to determine whether their pumps are operating at peak efficiency.

Pump evaluations conducted throughout Queensland under the RWUE program found that efficiencies ranged from 23 per cent to 73 per cent, with the average being just 48 per cent. It is generally accepted that pump efficiencies should be greater than 70 per cent.

Poor pump performance can be a result of age and wear of the pump and its components or it could be because the wrong pump has been installed. Some pumps, because of design and manufacturing limitations, are also simply less efficient.

Table One: Burdekin pump evaluation figures.

Pump	Type	TDH (m)	Flow rate (L/s)	Energy use		Pump efficiency per cent	\$/ML	kWh/ML/m head
				kW	kWh/ML			
1	River	18.5	123	44	100	56	20.0	5.4
2	River	22.8	46	17	102	73	20.5	4.5
3	Bore	13.0	46	19	115	34	22.9	8.8
4	Well	12.2	56	11	55	67	11.0	4.5
5	Well	10.7	68	11	45	72	9.0	4.2
6	Lagoon	8.2	103	18	47	53	9.5	5.8
7	Dam	6.9	133	19	41	50	8.2	5.9
8	Well	8.4	80	25	88	29	17.7	10.5

How pump performance is assessed

Pumps are always tested when they are operating under normal conditions. Obtaining a copy of the correct pump curve is also important. This will show the best efficiency point (BEP) for that pump.

When pumps are assessed, the following steps are followed:

1. Flow rate (L/s) is measured. This is easily done if a meter is fitted. If it's not, an external ultrasonic flow meter can be used.
2. Power consumption is measured. For electric pumps, this is the number of kilowatts (kW) consumed per hour of operation. For diesel pumps, it is the number of litres of diesel used per hour of operation.
3. Total dynamic head (m head) is calculated from the pressure at the outlet and the suction at the inlet.
4. When flow rate and total dynamic head are known, they can be plotted on the pump curve to compare the pump's operating

point with its best efficiency point.

Another measure of pump efficiency is the amount of power it takes to move a megalitre per metre of head (kWh/ML/m head).

It is calculated by multiplying the time (in hours) that it takes to pump 1 ML by the pump or motor's power consumption (kW) for that time and then dividing the answer by the total dynamic head. A number less than 5 is considered a good result.



Left: Furrow irrigation. **Center:** Centrifugal pump on a well. **Right:** Poorly performing pumps have high electricity costs.

Causes of inefficient pump operations

If a pump is performing poorly, the cause must be found.

- > Is the pump worn? Will it operate more efficiently if the worn parts are replaced or should the whole pump be replaced?
- > Is it the 'right pump for the job'? One of the worst performing pumps tested under the RWUE program was a new pump that had been installed in the wrong situation (Jessen, 2011).

- > If the pump is performing well but still costing a lot to run, is it on the correct tariff?

Reference

Jessen, M. 2011. On-farm pump testing for energy efficiency. *Irrigation Australia Journal*, Volume 26, Winter 2011.

Other reading

Irrigation Australia Journal, Winter 2011. Energy and Irrigation Feature. www.irrigation.org.au/publications-resources/irrigation-australia-journal

1. Pumping water is a major cost on most irrigated farms. Costs of over \$120/ML have been recorded (Jessen, 2011).
2. Poor pump performance is one of the main causes of poor irrigation efficiency.
3. Pumps tested under the RWUE program had an average efficiency of just 48 per cent, whereas the nominal benchmark is 70 per cent.

Which fertiliser should I apply on my ratoons?



David Calcino

Development Officer – Nutrition
Professional Extension and
Communication Unit



The 2013 harvest is well into the current season. Now until Christmas is the time the ratoons receive fertiliser to take them through the next 12 months. Which fertiliser do ratoons need and how much nutrient should be applied?

What nutrients does a sugarcane crop need?

All the nutrients in the diagram are necessary for cane growth.

Carbon, Hydrogen and Oxygen are supplied from water and the atmosphere. We don't have to worry about applying more of them.

Macronutrients and **silicon** are required in larger quantities than micronutrients. In most cane-growing regions, nitrogen (N), phosphorus (P) and potassium (K) must be applied in most years. Calcium (Ca), magnesium

(Mg), sulfur (S) and silicon (Si) might not have to be added. If they are required, they are applied at much less frequent intervals than N, P and K – for example, once per crop cycle or every second crop cycle.

Micronutrients or trace elements usually do not need to be applied.

However, zinc and copper deficiencies occur usually on lighter textured soils.

Iron deficiency is sometimes seen in very small patches but the crop almost always grows out of it.

Manganese (Mn), molybdenum (Mo) and boron (B) deficiencies have rarely, if ever, been diagnosed in Australian cane fields. If Mn, Mo or B applications are recommended, obtain a second opinion from a trusted advisor.

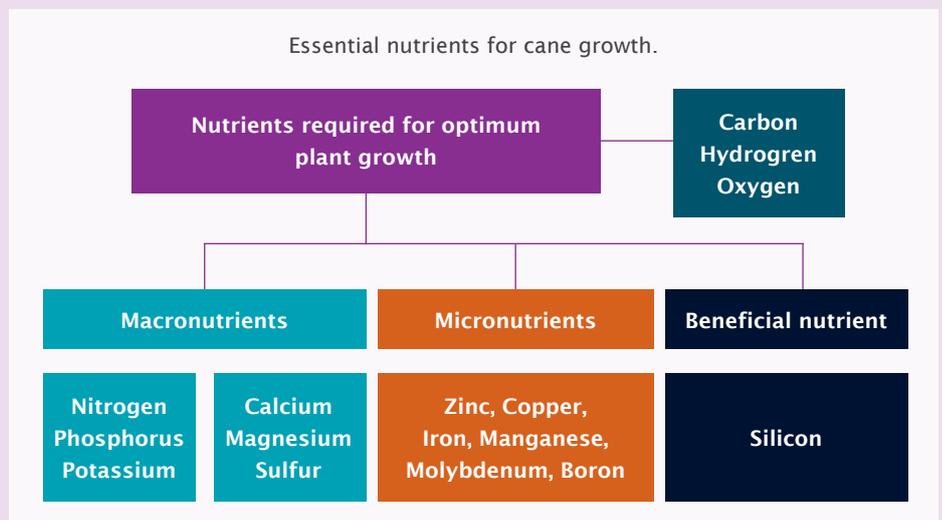
Soil test

Under Reef Regulation requirements, soil testing of blocks to be planted is mandatory. That soil test provides sufficient information on the nutrient requirements of the block for the whole crop cycle (e.g. plant cane and four ratoon crops).

The easiest, most reassuring way to work out which fertiliser a crop needs is to take a soil test.

While it costs a few dollars, a soil test can potentially save a grower far more money.

It provides the only sure method of knowing exactly what the crop requires.



Ratoon fertiliser rates

A soil test will identify which nutrients need to be applied to a particular block. With a SIX EASY STEPS Guidelines chart, the quantity of each nutrient that needs to be applied can be easily determined.

Types of fertiliser

Growers in some areas may have several options when choosing the type of fertiliser to apply.

Bagged fertiliser: The product all growers are familiar with, granulated or prilled fertiliser, is still the most commonly used source of nutrient.

Liquid fertiliser: Various liquid products are available to growers in some regions. They may contain some or all of N, P, K and trace elements. Customised blends are often available to meet the nutrient requirements of particular blocks as determined by soil test results.

Dunder-based fertiliser: These products are a valuable source of potassium, and, if urea or other solid fertilisers are added, of nitrogen, phosphorus and some trace elements.

Mill mud, mill ash and mud-ash mixtures: All three mill byproducts provide valuable quantities of nutrients. They can be a very

economic source of all the major nutrients, trace elements and silicon. To gain the most economic benefit from mill byproducts, their nutritional inputs must be discounted from any additional fertiliser applied to the ratoon crop.

Legumes: Legumes are grown in the fallow period prior to planting. While potentially providing high quantities of nitrogen to the plant crop, the nutritional benefits of legumes do not carry over to the ratoons.

No matter which product or combination of products is used, the recommended SIX EASY STEPS nutrient rates remain the same.



Left: Mill mud-ash contains the range of nutrients required to grow a crop. Adjust additional fertiliser inputs to your ratoon crop to account for these inputs by using the SIX EASY STEPS Guidelines for your region.

Right: After the crop is harvested, ensure you have a sound fertiliser strategy for the upcoming ratoon crop.

Leaf testing

A leaf test will check the adequacy of fertiliser inputs by identifying the level of uptake of all the nutrients and of any nutrients below the critical values. Leaf testing is recommended between December and April. Used in conjunction with soil testing, leaf analysis is a very handy tool to check on the nutritional health of the crop.

Summary

To manage the nutritional requirements of a ratoon crop, the results of a soil test are vital to guide decisions about fertiliser inputs. The SIX EASY STEPS Guidelines chart will allow an accurate assessment of the quantities of each nutrient to be applied. A leaf test will provide information on the nutritional uptake of the crop.

Benefits of controlled traffic farming

The Mackay experience

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Bradley Hussey

Development Officer –
Farming Systems

Professional Extension and
Communication Unit

Many growers in the Mackay region have moved to controlled traffic farming. This system is built on permanent wheel tracks where the crop zone and traffic lanes are permanently separated. Growers using this system have reaped a number of benefits.

Experiences from the Mackay district

An analysis of 2012 Mackay region productivity data established the level of adoption and productivity of controlled traffic farming.

Table 1 shows the production areas in hectares for the various row spacings used in the district. In cane farming, controlled traffic systems are based on row widths of 1.8 to 2.0 metres because they are best suited to the harvesting and haul-out equipment.

From the table it can be seen that the most popular row spacing is 1.6 m at 42.6 per cent of area, 1.5 m at 26.2 per cent of area and 1.8 m at 23.9 per cent of area. If we consider 1.8 m and above as a suitable row spacing for controlled traffic then 28 per cent of the Mackay district is farmed at this spacing.

Productivity

To analyse the productivity of this system, we combined the yields of the row spacings from 1.8 m and above as being controlled traffic and compared that to the yield of the narrow row spacing, from 1.5 m to 1.7 m. **Table 2** compares the yields

of controlled traffic farms against that of non-controlled.

These totals show there is no yield penalty in moving to wider row spacing. In fact, there is very little difference between the yields of the two farming systems, though note that this result is from commercial mill data with a sample size of 60,000 ha from farms with varying practices. The large sample size adds to the confidence we can have in the data that there is no yield penalty in moving to wider row spacing.

To analyse the data further, we looked at the yields achieved for various crop ages at the various row spacings. We had data out to 6 ratoons and kept a large sample size of a minimum of 50 blocks for each comparison. We chose to compare the 1.5 m conventional row spacing to the 1.8 m controlled traffic row spacing as each had a total area of about 15,000 ha.

Figure 1 shows that the cane yield for 1.8 m row spacing was slightly higher than for the 1.5 m spacing for all crop ages out to 6th ratoon.

We also looked at the yield achieved for each major row spacing used in the industry. The yield data showed

very little difference between the spacings of 1.5, 1.6 and 1.8 metres. This fact should give growers confidence that they can move to wider row spacing without losing yield.

Benefits of controlled traffic

While similar yields are produced for all row spacings, the wider rows suited to controlled traffic lead to increases in field efficiency.

The move from 1.5 m to 1.8 m rows reduces the travel required per hectare by 1,100 m which lowers production costs.

Economic analysis of the controlled traffic system has shown a drop in growing costs of \$153/ha. Most growers who use controlled traffic have also adopted zonal tillage and fallow legumes to cut costs even further.



Table One: 2012 Mackay Area Productivity Services data.

Row spacing (m)	Production area (ha)	Per cent of total area
2.0	1,867	3.1
1.9	540	0.9
1.8	14,225	23.9
1.7	1,905	3.2
1.6	25,368	42.6
1.5	15,578	26.2

Table Two: Yields for controlled and non-controlled traffic farms.

Controlled traffic yield (t/ha)	Non controlled traffic yield (t/ha)
81.2	79.4

Key features of controlled traffic system

- > 28 per cent of the Mackay region farmed this way
- > No yield penalty
- > Similar yields at a lower cost
- > Costs cut by \$153/ha

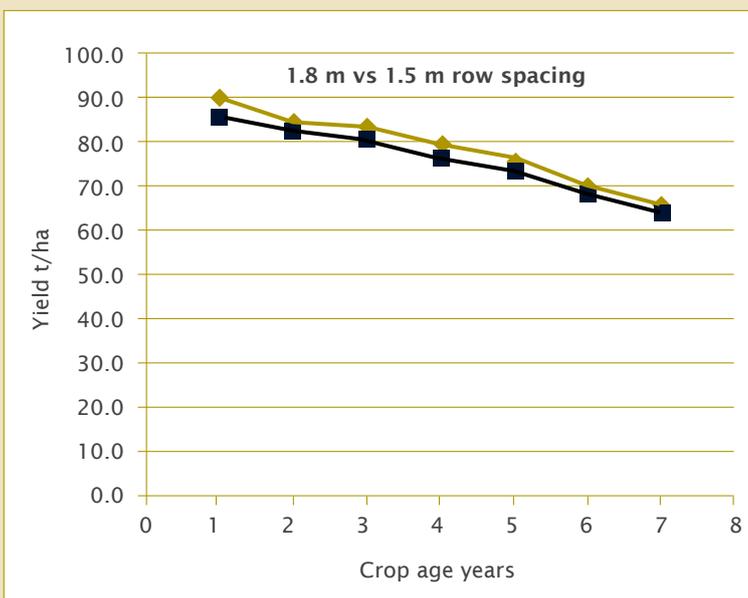
Sweet success

Vince Germanotta, a canegrower from the Homebush area south of Mackay, has adopted a controlled traffic farming system using 1.83 m single rows.

Vince cultivates plant cane with three-row equipment at a 5.5 m width per pass. This produces a work rate of over 4 ha per hour.

"The controlled traffic farming system has improved my farming efficiency," said Vince.

"By using this system I have also been able to adopt zonal tillage and band spraying, which has reduced my input costs but still maintained my yields."

**Figure One:** Comparison of cane yields at row spacings of 1.8 m and 1.5 m for various ratoon ages.

—◆— 1.8 —■— 1.5

Steps to consider when moving to controlled traffic farming

- > Deep ripping and cross ripping blocks to remove any underlying compaction before implementing the new system.
- > Block layout and farm design: realigning and amalgamating blocks done while changing row spacing.
- > Building improvements to the whole farm drainage plan into new rows and layout.
- > Using GPS to set the new row spacing, if possible.
- > Adjusting tractor wheel widths and machinery spacing to suit the new row width.

It's planting time and diseases are waiting to attack



James Ogden-Brown

Development Officer - Biosecurity

Professional Extension and
Communication Unit

With spring planting approaching, it is important that growers are aware of the soil-borne diseases that could affect their overall crop performance. The two diseases that could have the most impact are pineapple sett rot and pachymetra root rot. By understanding the diseases, you can plan to prevent and control the diseases to maximise emergence and crop yield.

A new registered fungicide for pineapple disease (also controls smut in plant cane) is available.

Use proven strategies to control both diseases:

1. Pineapple sett rot

Cultural practices and registered fungicide

2. Pachymetra root rot

Rotate with resistant varieties



Above: Pineapple sett rot. Note the central blackening.

Pineapple sett rot

The main disease that affects crop emergence is pineapple sett rot.

This soil-borne disease is favoured by conditions such as cold, wet soil or excessively dry soil that slows germination of the cane. The fungus (*Ceratocystis paradoxa*) is present in all sugarcane soils and can multiply on any organic matter such as stubble and billets left over from the previous crop. The fungus enters through the end of the sett or damaged parts of the sett.

When infected setts are freshly split, they smell like an overripe pineapple (hence its name). You can also identify this disease by the reddening and central blackening of the internal sett - the blackening is caused by the massive number of spores.

Prevention and control

- > Use a registered fungicide to thoroughly cover the sett, particularly the cut ends.
- > If possible, plant when the weather

favours rapid germination and soil temperatures are above 18°C.

- > Try to reduce the number of spores to limit the potential of the disease - use a rotational crop or a bare fallow between crops.
- > Do not plough out replant because it creates an ideal environment for the fungus to multiply in the soil.
- > Plant two or three bud setts to increase the likelihood of germination. The nodes act as a barrier which can slow the spread of the fungus in the sett. They also protect the buds sufficiently until they germinate.
- > Optimise the harvest by synchronising the rollers and cutters. This helps avoid crushing setts - a very important way to reduce harvest damage. Rubber coating rollers is another modification used to reduce sett damage.
- > Ensure soil has a good tilth and that there is good soil-sett contact - try pressing the rollers to compact the drill after planting.



Table One: Registered fungicides for Pineapple sett rot.

Trade name	Active ingredient	Rate	Remarks
Sinker®	500 g/L flutriafol	500 mL/ha or 7.5 mL/100 m row	<p>For the prevention of primary infection of sugarcane smut and pineapple disease in sugarcane.</p> <p>Apply as a spray onto setts in the planting chute. The spray should be applied with a minimum of 4 nozzles arranged in the planting chute to give thorough coverage of all surfaces of the setts before they are planted in the furrow. Apply in a minimum water volume of 350 L/ha and calibrate the planter prior to application and planting to give the correct rate of fungicide (500 mL/ha or 7.5 mL/100 m row).</p> <p>The use of a non-ionic wetting agent at recommended rates will enhance coverage of the fungicide on the planting material.</p> <p><i>* The rate is based on single row cane with a 1.5 m row spacing. If row spacing varies from 1.5 m then apply at the use rate according to mL/100 m of row.</i></p>
<p>Sinker® is a new registered fungicide for the control of pineapple sett rot. This product also controls smut in the plant crop.</p> <p>Note: It does not replace smut-resistant varieties. It is used only as a management tool.</p>			
Tilt® 250ec, Bumper® 250ec, Throttle®	250 g/L propiconazole	20 mL/100 L water	Ensure thorough coverage of the cut ends of sugarcane setts.
Tyrant® 500	500 g/L propiconazole	10 mL/100 L water	Ensure thorough coverage of the cut ends of sugarcane setts.
Bayfidan® 250ec	250 g/L triadimenol	20 mL/100 L water	Apply to setts by dipping or spraying. Ensure thorough wetting of cut ends.
Sportac®	450 g/L prochloraz	40 mL/200 L water	Apply as a dip or spray to setts at planting. Ensure thorough coverage of all cut ends.
Shirtan®	120 g/L mercury (Hg) present as methoxy ethyl mercuric chloride	250 mL/200 L water	For dipping of small quantities use wire mesh baskets or crates to contain the cut setts and dip for approximately 30 seconds. Move the setts about in the solution to ensure thorough wetting. The solution should be discarded after completion of the dipping. If the solution changes in colour from red to black it should be discarded. For use in spray or dip planters. Ensure thorough wetting of cut ends or setts. If solution colour changes from red, or it becomes contaminated with soil, it should be discarded.



Above: Poor emergence caused by pineapple sett rot.

Sugar matters

Stopping the spread of unwanted pests and diseases

Plant material or machinery that has been in contact with a sugarcane plant, or soil on which a sugarcane plant is or has been growing must have an Inspector's Approval to move between pest quarantine areas.

In the past Inspector Approvals were managed by BSES.

If you need to move a machine between pest quarantine areas you should contact your nearest Plant

Protection Act Inspector. In most areas some productivity service staff have been appointed Inspectors by the Department of Agriculture, Fisheries and Forestry Queensland (DAFFQ) for the inspection of machinery.

For approval to move sugarcane plants between pest quarantine areas or for further information visit the DAFFQ website www.daff.qld.gov.au or call 13 25 23.

Pachymetra root rot

Pachymetra root rot (*Pachymetra chaunorhiza*) greatly reduces root growth and yield in susceptible varieties. It is a major disease in many parts of Queensland and the Condong mill area in New South Wales. To minimise losses, appropriate controls must be used.

Affected root systems typically exhibit a soft, flaccid rot of the larger roots, and are much smaller than healthy root systems. The fungus invades individual roots, usually near the root tip, and breaks down the internal root tissues. These roots either stop growing or are completely destroyed. Expect yield losses of up to 40 per cent from this disease.

Prevention and control

The only strategy for controlling pachymetra root rot is the use of resistant varieties. Some Australian varieties have good resistance to the disease and all varieties are screened for resistance before release.

Pachymetra spores are long lasting and can survive for more than five years in the soil. Short-term fallows (less than 12 months) have minimal effect on pachymetra root rot, and exposing soil to direct sunlight also has a minimal effect.

A soil assay for pachymetra root rot, based on counting spores of the fungus in field soil, can be used to determine the likely severity of the disease in commercial fields.



Above: Damage caused by pachymetra root rot.



Above: Pachymetra root rot effect on root growth. A more resistant variety (left) is not as damaged as the more susceptible variety (right).

Table Two: Soil assay for pachymetra root rot.

Probable disease severity	Fallow field	Standing crop
Low	0 - 30,000 spores/kg	0 - 50,000 spores/kg
Medium	30 - 60,000 spores/kg	50,000 - 100,000 spores/kg
High	> 60,000 spores/kg	> 100,000 spores/kg

The resistance ratings for all approved varieties are available from your local Productivity Service Officer, or from QCANESelect™ on the SRA website.

For our growers in New South Wales

New soil management guidelines to help you manage costs and farm more sustainably

On-farm nutrient management should be based on a sound understanding of soils.

Soil type influences decisions on the variety to plant and the amount of fertiliser to apply. It also has an impact on the choice of tillage practices, planting techniques, drainage and harvest schedule.

A good understanding of the different soil types, including their appearance in a landscape, can help growers farm more precisely.

If you haven't already picked up a copy of the *Soil-Specific Nutrient Management Guidelines for Sugarcane Production in New South Wales* from the Ag Office at your local mill, make sure you collect one during your next visit.

Developed in conjunction with the NSW Sugar Mill Co-operative Limited (NSW Sugar), the booklet combines

the SIX EASY STEPS program with unique aspects of growing cane in NSW to produce nutrient management guidelines specific to the soils of the three cane-growing districts.

Soil management guidelines for Isis and Mackay will be released by the end of the year, followed by guidelines for the Wet Tropics in early 2014.



(Continued)

Helping you improve your harvesting

This year's crush is well underway but with harvesting still to continue for another three months it's important to get it right.

Research by SRA's engineering division has shown that not using best practices – such as reducing harvester fanspeed and managing bin weights – could cause financial losses over \$1000 per hectare.

To help growers we will be conducting demonstrations in the NSW region to showcase the economic benefits of Harvesting Best Practice (HBP).

At the demonstrations you can learn more about the changes you can make during harvesting to reduce losses.



**4-11 September 2013
New South Wales**

You will also have the opportunity to see first-hand a prototype mobile system that accurately measures sugar loss in the field.

To register to attend a demonstration, contact Phil Patane, Development Officer – Harvesting, SRA on 0431 818 482.

Are you rat ready?



Phil Ross

Development Officer – Weed and Pest Management

Professional Extension and Communication Unit



Cane growers are allowed to bait for rats from 1 October through to 30 June. However, there are a few things you need to consider in managing rats.

The rats that cause most damage to cane, the ground rat (*Rattus sordidus*) and climbing rat (*Melomys burtoni*), are both native mammals and are protected under the *Nature*

Conservation Act 1992. Baits may be used as part of a management program under the conditions of an industry-wide Damage Mitigation Permit, issued by the Department of Environment and Heritage Protection.

For the cane industry to maintain this permit, it is important that growers meet the following requirements.

> Before baiting, provide details of blocks to be baited and the species targeted. You can do this in two ways:

1. Provide details to your local productivity service company, or
 2. Go to the website www.hcpsl.com, then to Prod Services Groups section, then to the Rat Monitoring Program for all Prod Services Groups. You will find an Excel spreadsheet where you can enter your baiting details. You will need to download it to your own computer, and email it back to your own productivity service company after filling in details. Growers in all regions are able to use it.
- > Bait only between 1 October and 30 June.

> For in-crop baiting, both Racumin® applied in bait stations or Rattoff® may be used, as directed by the product label.

> The only non-crop harborage areas permitted for baiting are manufactured infrastructure and in these areas, only Racumin® in bait stations may be used.

Baiting is only one component of a rat management program and, ideally, neighbours should work together to manage them.

Rats cannot reproduce on a diet of sugarcane only. Males and females need the protein in grass and weed seed to maximise their reproductive capacity.

To prevent rat numbers from exploding:

- > Reduce the initial numbers of rats recolonising blocks after harvest.
- > Prevent reproduction.

This can be achieved by the following methods:

- > Eliminate weeds in cane fields. No weeds = no seeds = no protein = no breeding.
- > Manage non-crop harborage areas to eliminate suitable cover and weed seeds.
- > Encourage natural predation by owls by retaining habitat trees in remnant vegetation.
- > Bait strategically to reduce the rat population – before they breed.

Baiting by itself is unlikely to control rats!

To provide rat baiting details, regardless of where you farm visit:

www.hcpsl.com

Click PROD SERV. GRPS and follow instructions

The screenshot shows the HCPSSL website interface. At the top, it says 'HCPSSL Servicing the Herbert sugar industry'. On the left is a green navigation menu with items like HOME PAGE, SERVICES, UPCOMING EVENTS, VARIETIES, FACT SHEETS, HARVEST MGMT, PRECISION AG, PROJECTS, PROD SERV. GRPS, and CONTACTS. The main content area includes a 'MISSION STATEMENT' section with bullet points: 'A not for profit company, limited by guarantee' and 'Funded by voluntary membership from the Herbert cane industry'. Below this is a table titled 'Current HCPSSL Board Members' with names and roles: Roy Pace (Chairman), John Pratt (Deputy Chairman), Peter Allen, Ian Davies, Michael Waring, and Michael Reinaudo. On the right side, there are links for 'Week 6 WILMAR Crush Report', 'PRESS RELEASE', 'Managers Report June, 2013', and 'May Newsletter to all HBT Growers'.



Left: Ground rat damage at the base of stalks.

Right: Climbing rat damage about 1 to 1.5 m above ground.



Exotic weed finds its way to Australia

Red witchweed:
Striga asiatica



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- > If you suspect that you have red witchweed on your property, you **must report it immediately to Biosecurity Queensland on 13 25 23.**
- > Mark or clearly note the location of the weed and, where possible, take photos that may be used to help with identification.
- > Do not attempt to remove any flowering plants as this may allow the weed to spread tiny, dust-like seeds.

- > If red witchweed is suspected, soil, machinery or products that might contain soil should not be moved off site until a Biosecurity Queensland officer is consulted.

Left: *Striga asiatica* on a Mackay farm. It looks different to other weeds you'd expect to find in sugarcane. (Photo by M Mackenzie).

Above: *Striga asiatica* from Reunion Island (near Africa) where it is common in sugarcane. (Photo by E Fillols).

Be alert but not alarmed

Growers will be aware that the Class 1 Declared weed *Striga asiatica* (red witchweed) is present on a few farms in the Mackay area.

Biosecurity Queensland is continuing to survey properties to define the weed's distribution. To date the weed has been confirmed on four farms.

The potential impact of red witchweed

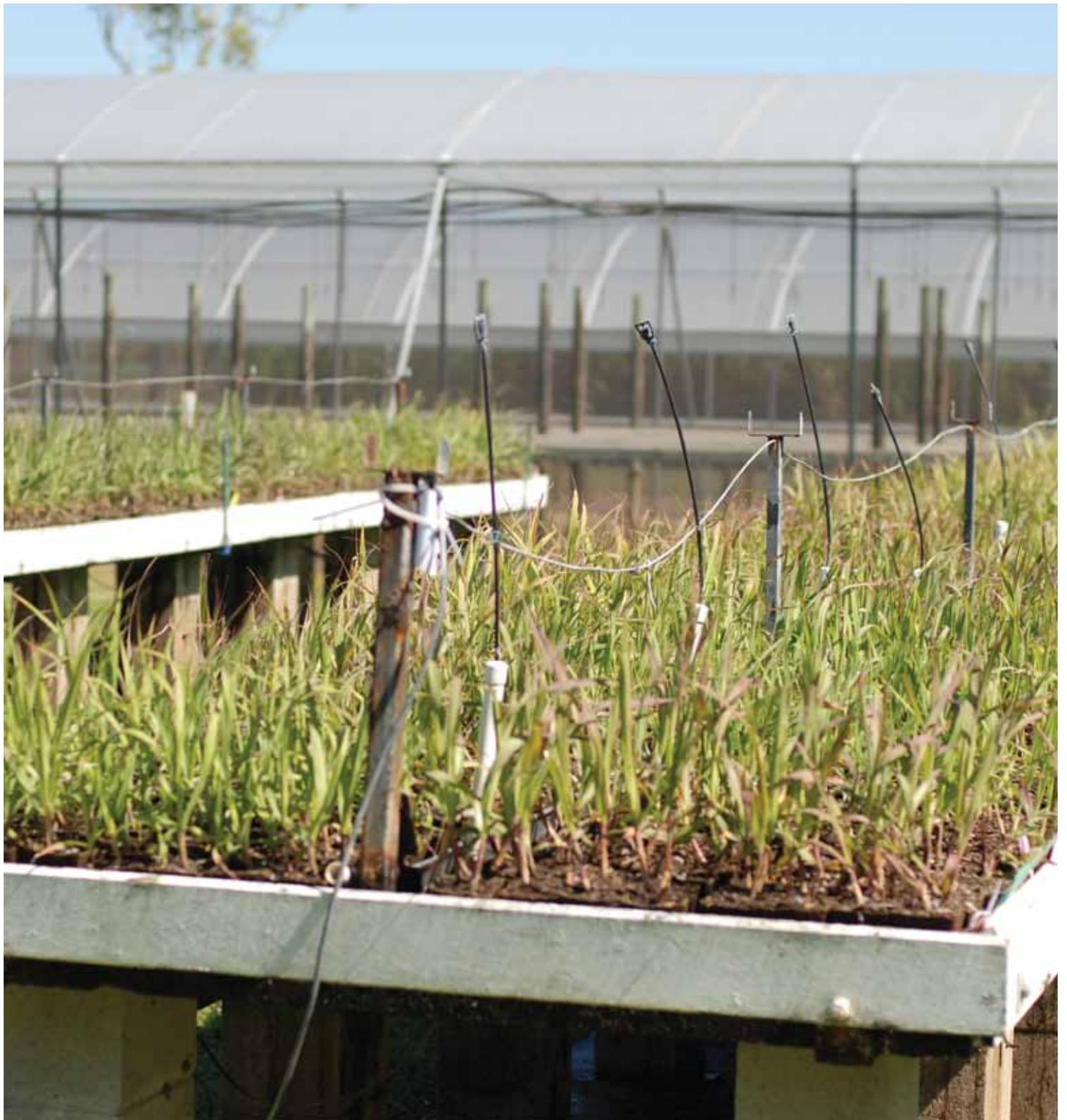
Experience from overseas suggests that *Striga* is of **minor importance in sugarcane**. It is, however, of **major importance in other crops** such as sorghum, rice and wheat, in which it can reduce yields severely.

SRA researcher, Emilie Fillols, spoke with weed research colleagues in CIRAD (Centre de coopération internationale en recherche agronomique pour le développement), a French agricultural research centre, about their experience with the weed.

Their research indicates the following:

- > *Striga asiatica* has been recorded for decades in sugarcane overseas. It has been considered a minor weed as it generally does not affect the yield of sugarcane.
- > It is a parasitic weed that takes nutrients and water from its host.
- > The seeds of *Striga* germinate only after stimulation by chemicals from the host's roots.
- > Sugarcane, as well as sorghum, rice, wheat and corn, exude these stimulants from their roots and are hosts.
- > Some other plants, such as soybean, peanut, lablab, cowpea, desmodium, stylo, couch grass and Brachiaria, also stimulate the seeds of *Striga* to germinate but do not allow the weed to parasitise them, which kills the newly germinated seeds. This is used as a method of control overseas.
- > To germinate successfully, *Striga* seeds need:

1. Soil moisture to hydrate the seed.
 2. An optimum soil temperature of 30°C (germination is possible between 25 and 35°C).
 3. To be within 10 mm of the host plant root tips to receive the chemical germination stimulation.
- > Seed may be dormant for 10 to 20 years.
 - > Seed can be spread by wind, run-off, farm machinery and exportation of mulch.
 - > *Striga* plants emerge about 6–7 weeks after the germination. Flowering occurs 5–6 weeks after emergence, with mature seeds disseminated 2–3 weeks after flowering (Madagascar conditions). One plant produces 10,000 to 100,000 microscopic seeds (black dust) contained in small capsules (5–6 mm long).
 - > *Striga* thrives in poor soils with low organic matter and nitrogen, and in areas with low and irregular rainfall.



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