



Industry update

5 March 2014

sra

Sugar Research
Australia

In February 2014, SRA in conjunction with local productivity services groups – Burdekin Productivity Services Ltd, Herbert Cane Productivity Services Ltd, the Mulgrave Productivity Committee and Mackay Area Productivity Services – held Yellow Canopy Syndrome (YCS) information sessions in Ayr, Ingham, Gordonvale and Mackay.

The sessions were well attended by growers, millers and other industry participants who were keen to learn more of what we know about the condition and how our research is progressing.

Attendees were also invited to ask our researchers questions, some of which are contained in this industry update.

It is important for the entire sugarcane industry, even those in unaffected areas, to stay informed about YCS.

We will continue to provide updates on the condition on a regular basis.

YCS in Queensland in the 2014 season



Above: SRA addressing the Burdekin sugar community. (Image courtesy of CANEGROWERS Burdekin)



What we know about YCS

Possible causes of YCS that have been investigated	Possible causes that have been ruled out	Why this possible cause has been ruled out	Future research activity
Herbicides	Herbicide application	YCS has been seen on farms where no herbicides have been applied. Where symptoms have been seen they do not reflect the impact of one particular herbicide.	No further research at this stage
Nutrition	Nutrient deficiency or toxicity	The analysis of soil tests from some affected blocks showed no nutrient deficiency or toxicity. The widespread distribution of YCS on many soil types, over a number of regions, make it extremely unlikely to be a nutritional or chemical problem.	No further research at this stage
Root growth	Poor root growth	YCS-affected stools showed different root growth patterns ranging from good to relatively poor.	No further research at this stage
Insects	Linear bugs	Although damage by linear bugs may result in similar symptoms to YCS, extensive cage trials showed no correlation between a linear bug infestation and YCS.	No further research at this stage
Disease	Known systemic, viral, bacterial and fungal diseases	The symptoms of YCS and its distribution within regions are not the same as any known disease. International pathologists have agreed with this conclusion. Molecular testing found no evidence of Yellow Leaf Virus or other phytoplasma in YCS-affected plants.	<div style="border: 1px solid orange; border-radius: 10px; padding: 5px; text-align: center;"> <p>See: 'What our current research is looking into'</p> </div>
Environmental stress	Nil	Environmental stress has not been ruled out as a cause.	

What our current research is looking into

As more has been learnt about YCS we have fine-tuned our research program and the possible causes that we are investigating. Our current research efforts are focused on the following:

Monitoring YCS

A series of sites have been established in the Burdekin and Herbert cane-growing regions and are regularly monitored at various levels of intensity. Observing when YCS appears and how its general appearance may be impacted by farm management and weather conditions, will help build a better understanding of the condition.

Transmission of YCS

A range of pot and fields trials have been established in a number of locations to understand if YCS can be transmitted in plant material.



Above: The SRA pot trial at Woodford seeks to understand if YCS can be transmitted via plant cane.





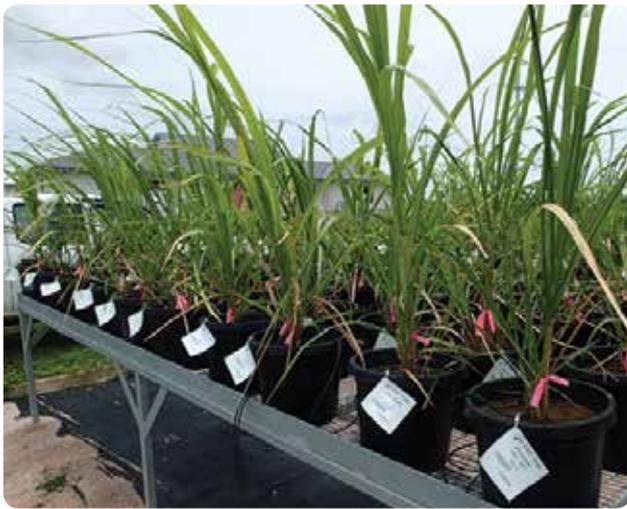
An unknown disease

Molecular work will continue in 2014 to determine if any previously unrecognised causal agent may lead to YCS.

YCS management

A range of trials are looking at whether certain conditions impact on the occurrence or severity of YCS. The treatments being tested include:

- water stress
- cold soak hot water treatment (CS-HWT) on YCS
- Imadacloprid.



Above: Cold-soak-hot-water treatment trial established by SRA in partnership with Burdekin Productivity Services Ltd.

What's next for the research program?

The Scientific Research Panel, an independent group of plant scientists was appointed as part of the Solving the Sugarcane Yellow Canopy Syndrome research project.

Last month the panel, SRA's YCS research project leaders, and SRA management attended meetings with industry in the Burdekin, Herbert and Mulgrave regions and toured affected farms.

This month these groups will meet with the SRA research team to review what we have learnt so far and identify any new areas of research that we should look into.

Answers to common grower questions

I have found YCS in my crops. What will it do to my cane as it grows?

YCS can impact cane in a number of ways. This can range from yellowing in one or two leaves to yellowing right through the canopy. Depending on the degree of symptoms, crop growth can be compromised with potential impacts on final yields. YCS symptoms may 'come and go' in waves through the season.

If you notice yellowing in your crops ensure that you check the symptoms with your local productivity services group. They will help confirm that you have YCS.

I have found YCS in my crops. Can I treat it?

Until we identify the cause of YCS, we cannot advise about on-farm management strategies to treat it. However, as part of our research program we are investigating a number of management strategies to see how they impact on YCS. Therefore, we recommend that crops are well managed with optimised inputs.

What happened to growers who were affected by YCS last year?

It has been difficult to assign yield losses solely to YCS except in cases where blocks were severely affected and where repeated waves of yellowing were observed over an extended period of time.

In these blocks yield reductions of between 30-70 per cent were measured. It should be noted that these severely impacted fields represented a small percentage of the fields that expressed symptoms.

Based upon our data, in less impacted fields (the majority) yield losses of 0-15 per cent were more typical.

Although CCS levels appeared to be lower in severely affected cane early in the crush, the levels improved as the crush continued. Little if any apparent losses of CCS were recorded as the season progressed.

Some growers have reported that fields affected last year are not yet showing YCS symptoms, while others report that YCS is present again.





Can YCS be transmitted via plant cane?

It has been suggested that YCS may be transmitted in planting material. Although our current trials that look to answer this question are still in progress, we have noticed that when growth conditions are ideal, no yellowing has occurred.

We therefore encourage growers to use approved seed cane where possible and to adopt good farming practices.

Is YCS worse in a plant crop or ratoon crop?

YCS has been seen at all stages of plant growth and in all crop classes.

Is YCS caused by or made worse by environmental or other stresses?

From our observations and those provided by growers in affected regions we believe that stress plays an important role in the expression of YCS.

Has YCS been found in other grass crops?

YCS has not been identified in other grass crops. It is important to investigate this further as it may provide new clues about what YCS is and how it behaves. In trials we are currently investigating if other grasses—including Gatton Panic, Rhodes Grass and Maize—are affected by YCS.

Is there a link between YCS and Golden Leaf Syndrome which is seen in Papua New Guinea?

The two conditions are similar and have similar symptoms. As there is no definite test for Golden Leaf Syndrome (GLS) and we have not yet identified what YCS is, we cannot say that they are the same condition. Nor can we say that YCS has come from Papua New Guinea.

More detailed observations of GLS in PNG will be made to see if further insights can be gained, that add to our knowledge of YCS.

Key symptoms of YCS

Overall the crop generally looks quite orange-yellow, with the yellowing extending into the youngest leaves in the worst affected crops.

Young leaves show faint yellowing at the tip. This progresses to a stronger yellowing generally to one side of the leaf and towards the leaf tip.



Above: Leaves showing typical Yellow Canopy Syndrome symptoms.

Leaves 5 or 6 generally show uneven coarse mottling, with areas of uneven green and yellow tissue developing.

Unlike typical viral or nutrient deficiency symptoms, this symptom is uneven, and looks more like a stress condition or herbicide effect. It extends right down the leaf blade.

With YCS, the midrib remains white and is the last part to turn yellow.

Leaves in the lower canopy are more uniformly yellow, showing areas of brown-black necrotic spots. Leaf tips and some margins begin to die, with older leaves senescing earlier.

Once affected, yellow leaves do not recover. In extreme cases, cane stalks may become thin and rubbery and root health is compromised. Symptoms may also 'come and go' in waves.

