

YCS update

July 2015

sra

Sugar Research
Australia™



By Professor
John Lovett

Chair
Scientific
Reference
Panel

Introduction

This newsletter is to update you on SRA's extensive work on the critical issue of solving Yellow Canopy Syndrome (YCS).

With harvest underway, it is clear that YCS is again having a serious impact on our industry. SRA and its Board have recognised the importance of this challenge and have responded accordingly since YCS first became of concern in 2012.

The latest round of SRA-funded projects announced for 2015/2016 has put a top priority on YCS, with two new SRA-funded projects scheduled to start in July 2015. Growers, SRA scientists and SRA's Scientific Reference Panel have all identified further work on root systems as a priority. In the first project CSIRO will look closely at the roots of YCS-affected plants. In the second, run by SRA, the build-up of sucrose in the leaves, links with other disorders and the impact on productivity will be looked at in detail.

These are added to ongoing projects looking at the role of stress on YCS plants, diagnosing the problem, and examining the complex range of potential living and non-living causes affecting the plant to determine possible causes.

We are continuing to learn more about YCS in terms of how the symptoms present and its impact on yield.

While we don't yet know what is causing YCS, we are making significant progress and know much more about this problem than we did just six months ago. Our knowledge is building week-by-week and we have some of the best minds from not just SRA on the job, but also from other major research partners in Australia and around the world.

We now have tools that clearly distinguish YCS plants from healthy plants, and now that we are able to define the symptoms, we are able to better focus our research.

With the harvest underway, it is worth noting that in previous years the CCS levels in YCS cane has increased as the harvest continued, which is something to consider for those of you dealing with YCS in your paddocks.

We also believe it is important and helpful to minimise stress on your cane, as much as possible.

If you have questions about any of these issues, or believe you need a block assessed for YCS, you should contact your local productivity board.



Belinda
Billing

SRA
Development
Officer

Introducing Belinda Billing

YCS Extension and Communication Officer

Belinda Billing now leads SRA extension of information on YCS.

This will involve working closely with the research teams and reporting new findings, the nature of research being undertaken and any important and interesting information coming out of this large body of work being conducted for the industry.

Belinda works as a Development Officer with SRA in the Burdekin, and will be working across the industry to help growers answer questions and act as a link between industry and SRA-funded research.

You can contact Belinda on bbilling@sugarresearch.com.au or (07) 4783 8602.



Herbert region grower **Matthew Pappin** has seen an improvement in some of his YCS-affected cane, but remains desperate for answers.

Grower observation: YCS problem hits CCS and yield

Herbert region cane grower Matthew Pappin is now entering his third harvest dealing with Yellow Canopy Syndrome (YCS) and he has described the impact on his farming business as “devastating”.

Mr Pappin farms near Helen’s Hill south of Ingham and aims to cut over 12,000 tonnes from about 190 hectares, although in recent years he has cut closer to 10,000 tonnes, with a large part of the drop due to YCS.

“In this area of the district, because of our poor soils, we don’t get the tonnes per hectare of other areas, so we rely on our sugar content to produce our profits,” he said. “Our first year of YCS I was in the haulout thinking that the block would have some 16s (CCS), which is not uncommon here. But it ended up 13-14 and the mill was 13.80, so I was getting a double whammy.”

That year Mr Pappin cut a block of plant cane at only 29 t/ha with CCS of around 9. After meeting with his local productivity board and SRA researchers he decided to let the cane ratoon, and it came back much greener and cut around 50 t/ha.

Mr Pappin says he was happy that the cane came back in the second year, however he found the sugar did not recover enough to make the block profitable and will plough it out this year after the second ratoon.

Mr Pappin has met with SRA and the local productivity board, there has been a farm walk at his property, and he also attends SRA updates when he can to get the latest information. He is also keen to hear more about new SRA research underway looking at the root systems of YCS affected plants.

“My observation is that the root system is so poor that the plants can’t stand up to drought, water logging, and harvesting speeds,” he said.

SRA research is also rapidly increasing its understanding around a number of issues that Mr Pappin has observed and is learning about at his own property. SRA is conducting a number of useful trials looking at factors such as heat stress, water stress, and responses to rain. The SRA research program is looking at the problem from all angles, including possible living and non-living causes, the role of stress, the roots, and other factors such as how plants are metabolising sugars. SRA is also determining the best ways of diagnosing YCS – as not all yellow cane is necessarily YCS.

SRA CEO Neil Fisher said the objective was to identify the cause of YCS and management techniques for it as quickly as possible, and that SRA had made YCS a priority issue for growers and millers.

The Herbert region is among the worst affected by YCS, along with Mulgrave, Burdekin and Mackay. YCS is also present in the Tablelands, Mossman, South Johnstone, Tully, Proserpine and Plane Creek. Pre-season, the tonnage loss for the Herbert due to YCS had been estimated in the range of 250,000 tonnes.

For Mr Pappin, the worst of the impacts at his farm were in 2013, and he has had some positive results from removing varieties that he believes are the worst-affected such as Q200[®], and is also managing to get a better response from irrigation.

Nonetheless, he is expecting the 2015 harvest to be down and is keen for answers on this mysterious problem.

YCS Frequently Asked Questions

What is YCS?

YCS is a syndrome that affects the sugarcane crop canopy by causing yellowing in the leaf. The yellowing has associated internal symptoms that impact the plant's ability to photosynthesise and mobilise nutrients and sugars.

What is the cause of YCS?

The cause of YCS remains unknown; however the on-going research program has improved understanding of YCS symptoms and patterns. (See page four for some of the SRA-funded research work currently underway.)

How will YCS impact on my crop yield?

Yield reductions associated with YCS vary greatly. Reductions of 10% have been noted and in some very severe cases 30% and above. Losses tend to be higher in cane that is first affected at an early age.

Will a YCS impacted block have YCS the following year?

Affected crops sometimes ratoon reasonably well and in some cases there has been little to no YCS found in the subsequent ratoon crop. There have been instances where YCS has re-appeared the following year, however what you see in your crop this year may not be there next year.

Will YCS reduce my crop sugar?

The impact of YCS on CCS has been difficult to quantify, however it is known that blocks with less than five active green leaves can have historically low CCS due to poor levels of photosynthesis.

What should I do?

YCS has been found in all varieties of sugarcane and under all manner of management practices and soil types. This makes it difficult to make recommendations for preventing and dealing with YCS. However, we can make some recommendations based on over-all good practices.

Planting

- Use the best planting material you have, preferably from a YCS free source.
- It is best to have a range of varieties growing across your property
- Plant cane that has the most green leaves possible

Crop stress

Attempt to minimise crop stress where possible.

Possible cause of YCS ruled out

Herbicide application	YCS has been identified on farms where no herbicides have been applied. Where herbicides have been used, active ingredients and brands vary across YCS affected sites.
Nutrition 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.
Linear bugs	Trials have been conducted and shown that YCS symptoms are not related to an infestation of linear bugs.
Heavy metals	Site testing has shown YCS is not related to heavy metals in soils.
Grower management practices	YCS is expressed across a range of farm management practices.
Soil type	YCS is found on blocks across all soil types.
Cane varieties	YCS has been found in all varieties of cane.
Fertiliser type, brand and additives	Researchers have reviewed fertilisers used across many affected blocks with no correlation found.
Weeds	YCS is found where a variety of weeds are present and with very high and very low weed pressure. Researchers have found no direct correlation between weeds and YCS.
Nigrospora fungus (used as a biological agent for controlling some grass weeds)	No signature metabolites for Nigrospora were found during an detailed analysis of the SRA YCS database.
Known pathogens	No known pathogen (virus, bacterium, fungus) has been found associated with YCS.

For more information contact YCS Development Officer Belinda Billing or your local productivity services board.

Or visit www.sugarresearch.com.au

SRA research looks at YCS from all angles

1

Leaves aren't able to **photosynthesise** as well as they should, and other leaves don't compensate.

2

Are there **biological vectors** spreading YCS? Our research is looking at possible causes such as fungi, viruses, bacteria, insects, and others.

3

Detailed molecular investigations are in progress at SRA and UWS. But so far there are no confirmed metabolic or genetic signatures pointing to the occurrence of known pathogens.

4

Researchers are looking at **outside stress factors** including water logging, dry conditions, radiation and heat. There are some indications that stress has an impact on YCS expression.

5

Crop management practices and soil health issues are being thoroughly analysed. Given the wide spread of YCS, it is **not thought** to be related to nutrients, herbicide use or other current crop management practices.

6

YCS plants have accumulation of **soluble sugars in the leaves**. Something is wrong with the metabolism of the plant, stopping it from transporting these sugars out to the stalk.

7

Further trials are looking at variability in YCS symptoms at different **crop maturity levels**. All cane varieties tested so far are susceptible.

8

Work in progress at UWS will be complemented by a **new project** led by CSIRO that will look at the links between root health and YCS.

