

NEW KIT TO HELP IDENTIFY YELLOW CANOPY SYNDROME

YELLOW CANE DOESN'T ALWAYS EQUAL YELLOW CANOPY SYNDROME. WITH A RANGE OF FACTORS THAT CAN MAKE CANE LEAVES TURN YELLOW, SRA IS DEVELOPING AND REFINING A TESTING KIT TO HELP THE SUGARCANE INDUSTRY MORE ACCURATELY IDENTIFY YCS.

One of the first steps with managing any crop issue or syndrome begins with diagnosing the problem.

Therefore, to manage yellow canopy syndrome (YCS), it is important to first understand how this syndrome changes plant health and the development of symptoms.

While the cause of YCS is unknown, early identification is key to managing the syndrome. With this in mind, one of the major focus points of the YCS research program has been on finding ways to identify cane that is developing or has YCS.

Targeting this objective, SRA has recently been validating a prototype testing kit that will help productivity and adoption officers better understand if a crop has YCS.

This work has been led by SRA Principal Technician Gerard Scalia and is occurring through the project, *Leaf sucrose: the link to diseases, physiological disorders such as YCS and sugarcane productivity*.

"Early detection is one of the key objectives of our research," explained Mr Scalia. "It could help industry with potential cost savings, and would be vital to making an assessment on potential control options, once they are understood."

The kit is designed to help train industry service providers and researchers to

better identify YCS in the field and help reduce misidentification, particularly given the range of other factors that can cause sugarcane leaves to turn yellow.

Over the last six months the prototype kit has been tested in the field with the assistance of Veronica Chapman (SRA) and Mike Turner (Bundaberg Sugar Services Ltd) in the Southern Region.

This work has helped validate the kit to the point where it is now being tested in more regions, although it is not yet ready for widespread distribution.

Once further validation has occurred, the kit may be useful in providing a clearer understanding of the severity and distribution of YCS throughout the industry.

Field Officer with Bundaberg Sugar Services Ltd, Michael Turner, said the kit had helped him work with growers to determine the cause of yellowing in a paddock – helping to identify which blocks had YCS, and also where there was some other issue affecting the crop.

"I have also used it to identify a block that was quite green – a block of KQ228[®] that was just turning yellow – and successfully identify that it had YCS," Michael said. "The dry summer in the region has been our main focus in this region, and YCS is not front of mind for growers here this season, but the kit has been helpful to

give an indication of what is happening, especially with some YCS occurring after some late rain."

Adoption Officer Veronica Chapman said the kit was easy to use and had been helpful in identifying true YCS as opposed to other conditions.

"The testing kit allows us to identify elevated levels of sucrose and starch in the leaves, which is a key symptom of YCS," she said.

"We are also looking for visual symptoms, which generally start with yellowing on one side of the midrib and then can move to both sides as the symptoms progress.

"We are looking for these yellowing symptoms in the mid canopy – above that natural senescence, and not in the new leaves in the upper canopy."

The kit works by applying a solution to a cut midrib section of the leaf. When viewed with a small magnifying glass, the mid-rib of YCS-affected cane has notably darker veins than non-YCS cane. Because sucrose and starch begin to elevate naturally throughout the day, the test needs to be conducted before 8am.

"We are seeking to couple the visual assessment of the leaf with the result from the kit, and if we get those two together then it is a fair indication that the grower has YCS," Veronica said.

SRA Executive Manager, Strategic Initiatives, Dr Frikkie Botha, said that there was also work occurring within the research program to develop more accurate identification methods.

"The in-field kit is a simple way of testing for sucrose and starch in leaves, but we are also working on finding more precise methods," Dr Botha said.

"We are continuing work to develop a biomarker that is unique to YCS looking within the DNA and RNA."

In parallel with work to diagnose YCS, other aspects of the research program continue to search for the cause and management solutions. This is occurring through a range of field trials, in the Burdekin, Herbert and Far North Queensland. ■

SRA acknowledges the funding contribution from the Queensland Department of Agriculture and Fisheries towards this research activity.

To see a video of the YCS testing kit in use, visit sugarresearch.com.au



(Above) Field Officer with Bundaberg Sugar Services Ltd, Mike Turner, and SRA Adoption Officer Veronica Chapman assessing YCS in the Bundaberg region recently. (Below) Sugarcane leaves that have been stained using the testing kit, with YCS cane on the left and healthy cane on the right. (Bottom) Advanced symptoms of yellow canopy syndrome.

