

Do I have Yellow Canopy Syndrome (YCS)?

Yellow Canopy Syndrome (YCS) is a newly identified condition impacting sugarcane crops in north Queensland.

Although YCS is present in many fields particularly in the Herbert and Burdekin cane-growing regions, it is important to remember that there are many reasons for cane going yellow.

Why might my cane be yellow?

Cane can turn yellow for a variety of reasons including drought stress, phytotoxicity (or herbicide damage), insect attack, disease, nutrient deficiency or natural maturing. In this information sheet we describe the symptoms that are commonly observed from each of these causes and describe how they differ from YCS.

Key symptoms of YCS

Overall the crop generally looks quite 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 (Image 1).

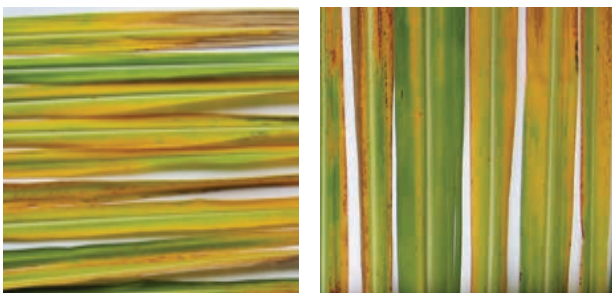


Image 1: Leaves showing typical Yellow Canopy Syndrome symptoms.

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.



Image 2: YCS-affected crop.

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.

Other factors which cause leaf yellowing

Diseases

Yellow Leaf Syndrome and Yellow Spot can be readily distinguished from YCS by examining leaf symptoms.

Yellow Leaf Syndrome (YLS) has various causes, one of which is sugarcane yellow leaf virus. The virus is known to occur in both Australia and overseas. YLS is characterised by:

- Yellow midribs in younger leaves (whereas midribs remain white in YCS).
- In YLS the yellowing may extend out from the midrib onto the leaf blade in later stages of the disease.



Image 3: Leaves showing symptoms of Yellow Leaf Syndrome. Note the yellow midrib.

Yellow Spot (YS) is caused by a fungus and is usually seen in the wet tropics. It is characterised by:

- Splotchy lesions which are initially yellow but turn brick red (whereas lesions are not a symptom of YCS).
- YS may cause the whole canopy to turn yellow/brick red/brown.

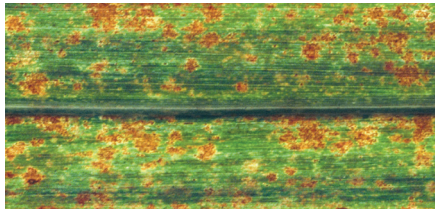


Image 4:
Yellow spot leaf symptoms.

Herbicide damage

Ask yourself, have herbicides been used on or near the affected crop?

Sugarcane can show a phytotoxic reaction to some herbicides. Leaf symptoms may be the result of herbicide uptake through the roots, leaves, or by leaf burn. Depending on the dose, soil texture, environmental conditions and variety, symptoms may vary but in general the following foliar symptoms are typically seen in cane:

Phytotoxicity symptoms due to systemic herbicides

- Yellowing of the whole leaf (diuron + hexazinone)
- Yellowing of the leaf margins and/or tips (atrazine)
- Yellowing of the leaf in combination with leaf stunting (imazapic)
- Bleaching (whitening) of the whole leaf (isoxaflutole)
- Leaf scorching and leaf tip dieback (2,4-D, MSMA)
- Slight reddish brown discolouration of the leaves covered by the spray (ametryn)
- Droopy, flaccid and yellow or necrotic leaves and marked growth reduction (glyphosate)

Phytotoxicity symptoms due to contact herbicides

- Leaf scorching and stunting (paraquat, diquat)

Usually phytotoxic symptoms are transitory and cane grows out of the symptoms with or without yield loss. However, cane harmed by glyphosate may continue to deteriorate and die.

Nutrient deficiencies

Cane can show yellowing in response to some nutrient

deficiencies. The table below describes how YCS differs from deficiencies likely to induce yellowing in the leaves of sugarcane.

Canegrubs

Crops affected by canegrubs look water stressed with leaves yellowing and eventually dying (Image 5). Damage to the root system is easily observed through a visual inspection, and symptoms include shortened roots, a lack of fine roots as well as chewing damage to the below ground stalks or stool.

Canegrub damage may reduce plant growth, and promote lodging and stool tipping. Between the months of February and May larvae should be easily observed amongst the root mass.



Image 5:
Damage typical of cane grub infestation.

Maturation and ripening of cane

Cane that is being dried down for harvest will also show signs of yellowing. Yellowing generally starts within the older leaves and gradually works its way up the plant.

Normal senescence is generally a light brown colour whereas YCS is a brighter yellow. The ripening phase corresponds to the cooler and drier time of the year, whereas YCS can occur anytime.

Water-stressed cane

Water stress may result from drought or water logging. Symptoms include the entire crop yellowing and in severe cases results in plant death. Yellowing starts in the older leaves and gradually works its way up the plant.

The tops of drought-affected cane will generally look dry before they turn pale brown. Water logging symptoms occur in the lower leaves and a pale yellow colour results. The crop will begin to show symptoms only after being water logged for a period of time.

Further information

Further information on each of these conditions is available on the Sugar Research Australia website www.sugarresearch.com.au. If you believe that you have any of these conditions or are unsure please contact your local productivity services organisation.

| Table of symptoms | Yellowing in | | Leaf death | Rubbery stalks | Other symptoms |
|---------------------|--------------|----------------|-------------------|----------------|--|
| | Older leaves | Younger leaves | | | |
| YCS | Yes | Yes | Older leaves | Sometimes | Uneven mottling |
| Nitrogen deficiency | Yes | No | On tips and edges | No | Reduced stooling |
| Calcium deficiency | Yes | No | Young leaves | No | Mottling or rusty appearance on older leaves |
| Copper deficiency | No | Some | None | Yes | Young leaves with interveinal chlorosis |