



Information Sheet

7. NUTRITION

7.8 Ratoon chlorosis

What is ratoon chlorosis?

Ratoon chlorosis is the yellowing of leaves in young cane due to interveinal chlorosis arising from a deficiency of iron (Fe). In its incipient stage, alternate green and chlorotic stripes, due to reduced chlorophyll content, extend along the full length of the leaf. With advanced deficiency the striping becomes less conspicuous and the leaves become uniformly chlorotic or white, with no green colour in the veins. Where the deficiency is acute the younger leaves may be entirely white, the intermediate leaves partly green, and the older leaves fully green. Iron deficient cane generally tends to show very patchy growth.

Why is it a problem?

The reduced chlorophyll content of sugarcane suffering from ratoon chlorosis results in reduced yields.

Occurrence

Two types of ratoon chlorosis have been identified. Alkaline chlorosis, or lime-induced chlorosis is frequently seen in young cane growing in Recent Sands around Mount Edgecombe, particularly where the pH of the soil is higher than 8 due to the use, many years ago, of large quantities of lime enriched filtercake. Lime-induced chlorosis may also occur in cane growing on old termittaria and, in the Northern Irrigated regions, in soils containing free deep limestone nodules and where filtercake containing excessive quantities of limestone has been applied. The presence of trash exacerbates ratoon chlorosis, but the recommended treatment causes symptoms to disappear in all circumstances.

The second less common chlorosis, occurs under acid soil conditions and is due to an induced iron deficiency resulting from excessive manganese uptake under cool, wet growing conditions in the Natal Midlands. Symptoms usually occur between October and December. Variety N12 appears to be more susceptible to 'acid' chlorosis than NCo376.

Treatment

Chlorotic cane should be sprayed with a 1.0 to 1.5% solution of ferrous sulphate as soon as there is sufficient leaf area, e.g. the five to six leaf stage. The ferrous sulphate with a suitable wetter should be applied at a rate of 300 to 400 litres/ha from a knapsack sprayer. The chlorotic symptoms generally disappear, but where the condition is severe, some cane stools do not recover. If symptoms do not disappear within three weeks of the first treatment, a further application of ferrous sulphate solution is recommended.



Characteristic iron deficiency symptoms in young cane.

Picture reproduced from *Sugarcane Nutrition*, Anderson DL and Bowen JE (1990)

Marked responses in yield have been obtained on Recent Sands with a high pH following the spraying of severely chlorotic cane with ferrous sulphate or ferric chloride. The results of a trial at Cornubia are shown in the table below.

| Treatments/ha | Tons cane/ha | Tons sucrose/ha |
|--------------------------|--------------|-----------------|
| Control | 139 | 18.0 |
| 3.4 kg FeSO ₄ | 150 | 20.4 |
| 6.8 kg FeSO ₄ | 156 | 20.3 |
| 3.4 kg FeCl ₃ | 166 | 22.1 |
| 6.8 kg FeCl ₃ | 163 | 22.5 |

When the results of all the treatments were pooled, a significant increase of 20 tons cane/ha was obtained, which was highly cost effective.

At this stage there is no effective economical *soil* treatment that can be applied to correct alkaline chlorosis. However, with acid chlorosis, dolomitic limestone applied at a rate of 3-6 tons/ha, depending on soil clay content, was found to be beneficial in reducing toxic levels of manganese in the leaf to below 300 ppm and stimulating the uptake of iron by the plant. Evidence from other industries has shown the treatment to be more effective if a silicate-based liming material is used.

Updated by Neil Miles (Senior Soil Scientist) January 2010