SUGARCANE MOSAIC

Sugar Research Australia

INTRODUCTION

Sugarcane mosaic is a disease that has been found in all regions of the Australian sugarcane industry but is currently restricted to the Southern region particularly the Bundaberg/ Childers district and has been seen in Rocky Point. Effective management strategies have restricted the intensity of infestations. Mosaic can cause losses of 30% or more in susceptible varieties. Sporadic outbreaks of mosaic can occur when conditions are favourable for the aphid vectors and susceptible varieties are grown.

Mosaic can disrupt disease-free (approved) seed schemes because it is transmitted through planting infected material. Careful inspection and roguing of infected plants are required to maintain the integrity of disease-free seed plots.

In Australia, we have only one strain of the sugarcane mosaic virus. Sugarcane mosaic is caused by a range of different viruses in other countries. In Asia and North America, mosaic disease is very widespread and causes small losses but over vast areas of sugarcane.

CAUSAL AGENT

Sugarcane mosaic in Australia is caused by strain A of the sugarcane mosaic virus. Similar viruses cause disease in maize, sorghum and Johnson grass in Australia, but these viruses generally do not infect sugarcane in the field.

In other countries, mosaic diseases in sugarcane are caused by sorghum mosaic virus and sugarcane streak mosaic virus. These viruses do not occur in Australia and are serious biosecurity threats to the Australian sugarcane industry.

SYMPTOMS

Mosaic disease is characterised by a mottled pattern on the leaves produced by contrasting light green to yellow and dark green patches. The patches are irregular in shape and have diffuse margins. Infected plants appear paler and more yellow than healthy plants. The symptoms are most easily seen in young rapidly growing leaves and the symptoms tend to fade as the leaves age. In some varieties, particularly varieties with dark red to purple stalks, the mosaic pattern can be seen on the stalks.

YIELD LOSS

Infected plants can suffer yield losses of 20-30% or even greater in ratoons. However, if the incidence of the disease in a field is low, the overall losses are minimal. Only in highly susceptible varieties are large patches of infected plants usually seen. Plants to not die from mosaic infection, so severe losses are usually only associated with a large area of infection.

Losses in Australia have been negligible because the disease is restricted to one district and the incidence of the disease has been kept at low levels by limiting the planting of susceptible varieties and through disease-free seed schemes.

DIAGNOSIS

Visual inspection for the characteristic leaf symptoms is usually the only diagnosis required. Specific molecular diagnostic tests are available to distinguish strains and species of the mosaic viruses. These are used in quarantine for disease-free movement of cane.

(Above) *Close-up of mosaic leaf symptoms.*

SPREAD

Mosaic can be spread by a number of aphid species in a non-persistent manner. The aphids feed on infected plants and spread the virus via their mouth parts for a number of days.

Aphid numbers vary from season to season. Rapid spread of mosaic has been associated with bursts of aphid activity.

Young plants are much more susceptible than older plants, and if aphid activity coincides with young plant or ratoon crops, the disease spread can be dramatic.

Mosaic can also be spread by planting infected stalks. If infected cane is planted, the resulting infected plants will act as a source for further spread by aphids.

Mosaic is not spread by knives or harvesters, but it can be spread by rubbing infected leaf extracts onto healthy leaves with an abrasive pad in experimental situations.

MANAGEMENT

Sugarcane mosaic is managed by resistant varieties and disease-free (approved) seed. Only a small percentage of varieties are considered too susceptible to be grown commercially in Australia because we have a mild strain of the virus and it is under control in a relatively small area.

Regularly obtaining disease-free (approved) seed is important in the management of mosaic. Disease-free seed plots must be regularly inspected for mosaic and, if infected plants are found, they must be immediately destroyed to prevent further spread. Disease-free seed plots should be located away from known sources of mosaic infection.

(Above) *Mosaic pattern on the leaves of a susceptible variety.*

Controlling weeds on which the aphid vectors can breed within fields and surrounding headlands may help to reduce spread.

Quarantine is important to prevent the spread of infected plants to districts where mosaic is not present and to prevent exotic strains of mosaic from entering Australia.

FOR FURTHER INFORMATION

If you would like further information on management of mosaic, contact your local adviser.

REFERENCE

Grisham MP. (2000). Mosaic. In: A guide to sugarcane diseases (eds Rott P, Comstock JC, Croft BJ and Saumtally AS. CIRAD/ISSCT, Montpellier.