

# Pacific Pests, Pathogens and Weeds - Online edition

## Maize mosaic (074)

### Common Name

Maize mosaic, corn mosaic

### Scientific Name

*Maize mosaic nucleorhabdovirus*; the abbreviation is MMV.

### Distribution

Asia (restricted), Africa, North (Florida, Hawaii), South and Central America, the Caribbean, Oceania. It is recorded from Fiji and Solomon Islands.

### Hosts

Maize, sweet corn and *Rottboellia cochinchinensis* (itch grass).

### Symptoms & Life Cycle

Apart from stunting, the virus causes light green to yellow stripes along the leaves (Photos 1&2). These stripes are either narrow, the width of a single leaf vein, or in bands 1-2 cm wide.

The virus particles are bullet-shaped when seen under the electron microscope. The virus is not seedborne, nor is it spread in infected plant material. It is spread by planthoppers, *Peregrinus maidis*, that live and breed on maize and the grass weed, *Rottboellia cochinchinensis* (Photo 3). The planthoppers feed on these plants, acquire the virus and, after a few days, during which time the virus multiplies in the insects, the planthoppers then spread it to other plants. Once infected, the planthoppers continue to spread the virus until they die.

Another virus, *Maize stripe virus*, causes similar symptoms in maize and *Rottboellia*, and is spread by *Peregrinus maidis*. However, this virus has not been found in Pacific island countries, but is reported from Australia. *Maize stripe virus* particles are long flexuous rods.

### Impact

Plants are stunted, and either the cobs do not develop, or they are deformed with fewer seeds than normal. However, the number of plants infected with the disease is usually quite small, perhaps 1-2%, and so it is unlikely that yields overall are reduced greatly. Sweet corn appears to be more susceptible than maize.

### Detection & inspection

Look for stunted plants, often present at or near the borders of the fields. Look for the yellow and green stripes, sometimes running the entire length of the leaves; these may be narrow, a single line or in bands, 1-2 cm wide. Importantly, look for populations of planthoppers in the 'funnel' of the young leaves; this is an indication that the symptoms (if present) are likely to be caused by *Maize mosaic virus*.

### Management

#### CULTURAL CONTROL

Pull out plants as soon as symptoms are seen. Do not wait; otherwise, the insects will breed and spread the disease. When pulling out the plants grasp the young leaves, holding them together, preventing the insects escaping from the 'funnel' of leaves. Put the plants into a sack and burn them, destroying plants and insects.

#### RESISTANT VARIETIES

It is likely that varieties of maize imported into Pacific island countries are from countries where

#### CHEMICAL CONTROL

Chemical control is not appropriate for this disease. Although insecticides could be used to kill the planthoppers that spread the virus, their use would not be economic as the number of plants with symptoms is usually low. Removal of infected plants is a better method of control.



Photo 1. Stunted maize with deformed ears (right) infected with *Maize mosaic virus*. Note the thin yellow stripes.



Photo 2. Stunted maize with single yellow lines and broad yellow bands running parallel to the length of the leaves. Note the ears are not only deformed, but mostly lack seeds.



Photo 3. Maize mosaic is spread by the planthopper, *Peregrinus maidis*. The planthopper breeds in the 'throat' of maize, and that is the place to look for colonies; sometimes, ants will be present too.

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Information from Maize mosaic virus (corn mosaic virus) (2019) Crop Protection Compendium. (<https://www.cabi.org/cpc/datasheet/32399>); and Tsai JH, Falk BW (undated) Insect vectors and their pathogens of maize in the tropics. CFANS, University of Minnesota. (<https://ipmworld.umn.edu/tsai-maize-tropics>); and from Kohler F, et al. (1997) *Diseases of cultivated crops in Pacific Island countries*. South Pacific Commission. Pirie Printers Pty Limited, Canberra, Australia. Photo 3 Richard Markham, ACIAR, Canberra.

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