

Pacific Pests, Pathogens and Weeds - Online edition

Maize aphid (330)

Common Name

Maize aphid, corn leaf aphid, green corn aphid

Scientific Name

Rhopalosiphum maidis

Distribution

Asia, Africa, North, South and Central America, the Caribbean, Europe, Oceania. It is recorded from Australia, Cook Islands, Fiji, New Caledonia, New Zealand, Northern Marianna Islands, Papua New Guinea, Solomon Islands, Tonga, and Wallis & Futuna.

Hosts

Maize, sorghum, barley, millet, and many grasses.

Symptoms & Life Cycle

Aphids suck the sap of plants, often occurring in large numbers, causing plants to yellow and wilt. Sooty mould fungi develop on honeydew discharged by the aphids that falls onto the leaves. Large numbers of aphids occur on maize 'tassels' (the male flowers) preventing the development of pollen (Photo 1).

Male aphids are very rare, and females give birth to living young without mating. Nymphs are light green, darkening to bluish or olive green adults, with black antennae and legs, and purple areas at the base of the two upright, backward-pointing tubes ('cornicles') at the rear of the body (Photo 2). The adults are somewhat rectangular, about 2 mm long, mostly without wings (Photo 3). Nymphs become adults within 7-14 days, depending on temperatures.

The aphids are mostly in the whorls of leaves and on the tassels in the upper parts of the plants. When populations increase some of the aphids are born with wings allowing them to move to other plants in the field or to other fields. Spread also occurs in wind currents.

In many countries, ants protect them from predators and parasitoids.

Impact

Impact is greatest on maize, sorghum and barley. Direct effects occur when the aphid feeds on plant sap, and indirect damage occurs from discharge of honeydew and the spread of viruses. Losses depend on the variety, stage of infection and environmental conditions. In some countries, losses of more than 60% are reported on maize.

In Pacific island countries, the aphid is not usually a serious pest of maize, but in Fiji it is said to cause some wilting during dry periods. There, and in other countries, honeydew, and the fungi that grows on it, can reduce photosynthesis. Infestations of aphids on tassels leads to honeydew covering silks probably reducing pollination. Honeydew on cobs is unsightly and lowers market appeal.

The aphid spreads many viruses, e.g., *Sugarcane mosaic virus*, which infects both sugarcane and maize, and it is a major vector of *Barley yellow dwarf virus*, one of the most important diseases of cereals.

Detection & inspection

Look for colonies in the whorls of leaves at the top of the maize. Look for ants that are attracted to the aphids' honeydew. Look for honeydew on leaves, tassels, and cobs.



Photo 1. Colonies of the maize aphid, *Rhopalosiphum maidis*, on the tassels of maize.



Photo 2. Maize aphids, *Rhopalosiphum maidis*,



Photo 3. Adult maize aphid, *Rhopalosiphum maidis*,

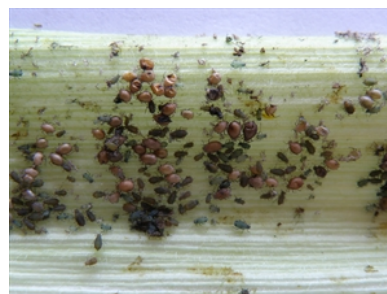


Photo 4. Colony of maize aphid, *Rhopalosiphum maidis*, with numerous 'mummies', swollen parasitised individuals. The papery skin of some has collapsed after the exist of the parasitoid.

Management

NATURAL ENEMIES

Aphid populations are controlled by environmental factors, several parasitic wasps, fungal diseases, ladybird beetles, syrphid fly larvae, and lacewing larvae and adults. Of the many wasps that attack the maize aphid, *Aphelinus maidis* is common in Hawaii and populations are controlled by this introduced parasitoid. Other species of *Aphelinus* have been used elsewhere with equally beneficial results, as well as the braconids, *Lysiphlebus* species. Parasitised swollen aphids are called 'mummies' (Photo 4).

CULTURAL CONTROL

Methods have been tried, e.g., changing planting times, intercropping, altering spacing, but none have provided useful results. Others can be tried:

Before planting:

- Do not plant down-wind from crops with aphids. Some aphids have wings, but they are not strong fliers, and are more likely to be blown in the wind onto new crops.

During growth:

- Remove weeds from within and also outside the crop.
- Inspect crops often and regularly; destroy leaves heavily infested with aphids by hand (or if necessary use insecticides - see below).
- If ants are present, find the nest, and destroy it with boiling water, if practical and plants are not at risk of damage, or use a pesticide (see below). Without ants, predators and parasites will bring about natural control.

After harvest:

- Collect, burn or bury the remains of crops after harvest.

RESISTANT VARIETIES

In sorghum, hybrids with open heads are less infested than tight-headed hybrids. Resistant varieties of maize and barley are known too; these have leaf compounds which have a defensive role against the aphid.

CHEMICAL CONTROL

If insecticides are necessary, use any of the following "soft" insecticides on aphids:

- Soap sprays (5 tablespoons of soap in 4 litres water).
- Vegetable oil (1 cup cooking oil; 2 cups water; 1 teaspoon dishwashing liquid. Dilute the mixture at 3 teaspoons per half litre of water and spray on the infested leaves).
- Commercial products with petroleum oil: follow the instructions on the product label.

These sprays work by blocking the breathing holes of insects causing suffocation and death. Spray the underside of leaves, as the soap and oils must contact the aphids. Home-made preparations are ideal for small numbers of plants, but commercial products are probably the only practical solution when crop areas are large.

Alternatively, use:

- Plant-derived products, such as neem, derris, pyrethrum and chilli (with the addition of soap).
- Note, varieties of *Derris* exist in Papua New Guinea and Solomon Islands that contain 2-3% rotenone, and are effective insecticides. However, they should be used with caution. (For methods of preparation, **see Fact Sheet no. 56.**) Check if *Derris* is available locally in your country.
- Synthetic pyrethroids are likely to be effective, but will also kill natural enemies. However, they can be used to kill ants, which often tend aphids for their honeydew, and protect them from effective control by predators and parasitoids.

When using a pesticide (even a biopesticide), always wear protective clothing and follow the instructions on the product label, such as dosage, timing of application, and pre-harvest interval. Recommendations will vary with the crop and system of cultivation. Expert advice on the most appropriate pesticide to use should always be sought from local agricultural authorities.

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Information from CABI (2015) *Rhopalosiphum maidis* (green corn aphid). Crop Protection Compendium. (<https://www.cabi.org/isc/datasheet/47318>); and *Rhopalosiphum maidis* (Fitch) (1992) Crop Knowledge Master Department of Entomology, Honolulu, Hawaii. (<http://www.extento.hawaii.edu/kbase/crop/type/rhopalos.htm>); and Mound L, et al. (2007) corn leaf aphid (*Rhopalosiphum maidis*): PaDIL - (<http://www.padil.gov.au>); and from *Rhopalosiphum maidis*. Wikipedia. (https://en.wikipedia.org/wiki/Rhopalosiphum_maidis). Photo 1 Eric Burkness, Bugwood.org. Photo 2 Kansas Department of Agriculture, Bugwood.org. Photo 3 Brendan Wray, AphD, USDA APHIS ITP, Bugwood.org.

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