

Lettuce mosaic (228)

Common Name

Lettuce mosaic

Scientific Name

Lettuce mosaic virus; the abbreviation is LMV.

Distribution

Asia, Africa, North and South America, the Caribbean, Europe, Oceania. It is recorded from Australia and New Zealand.

Hosts

Lettuce, and many other members of the Asteraceae family. The main hosts, other than lettuce, are, chicory, and several ornamentals (e.g., *Osteospermum* and *Coreopsis* species), and common weeds: *Sonchus* (sowthistle) and *Stellaria* (chickweed).

Symptoms & Life Cycle

Light and dark green patches on the leaves, puckering, sometimes with browning of the veins (Photos 1&2). Generally, the plants are stunted, yellow, with the edges of the leaves rolling downward, and unmarketable.

There are two ways that the virus is spread. It is spread in seed and also by aphids. Seedborne infections are important as they can be very common, depending on the time that the mother plant was infected, the virus strain, the lettuce variety, and the temperature. Up to 40% of the seed can be infected. The virus can be spread long distances in seed, possibly between countries.

Spread by aphids is usually over shorter distances, between plants in the same crop or between crops in the same region. There are many species that spread viruses naturally, although some species are more efficient than others. In Pacific islands, *Aphis gossypii* is a common species and is known to transmit the virus in a non-persistent way (from research done elsewhere); this means that aphids pick up the virus on their mouth parts after a short feed on an infected plant (less than a minute), then infect a healthy plant the next time they feed, but soon after lose the ability to infect.

Apart from spread between lettuces, it also occurs from several ornamental daisies and weeds.

The virus is also present in pollen, and seed becomes infected at fertilisation.

Impact

Lettuce mosaic is an important virus disease, with varieties differing in their reaction to infection. Affected plants do not produce marketable heads. There have been several major epidemics of the virus, and because it is seedborne, there are schemes in many countries to produce seed certified free from infection.

In Australia and the USA, seed is certified free from infection if there is only one seed infected per 30,000. In Europe, it is less than this. Experience has shown that levels as low as 0.1% are sufficient to start an epidemic if there are aphids migrating through the crop, probing the plants as they stop to feed.

Detection & inspection

Look for light and dark green patterns on young leaves that have ragged edges.



Photo 1. Small yellow lettuce with down-turned leaves infected with *Lettuce mosaic virus*. Compare with green healthy plant behind.



Photo 2. Patches of yellow and green patterns - a mosaic - on a lettuce leaf infected with *Lettuce mosaic virus*.

Management

QUARANTINE

As this disease is not recorded in Fiji, Samoa, Solomon Islands and Tonga, biosecurity authorities should consider the potential pathways for entry. Note that it is seedborne.

CULTURAL CONTROL

Before planting:

- The virus is seedborne, therefore make sure that seed is certified free from *Lettuce mosaic virus*.
- Do not plant new crops next to those that have the disease, as transfer of the virus from old to new will be rapid, possibly leading to epidemics of the disease.

During growth:

- Keep weeds to a minimum, both within and around plots of lettuces; some weeds are hosts of the virus, and also host to aphids which spread it.

After harvest:

- Collect and remove all debris and burn or bury it.

RESISTANT VARIETIES

There are commercial varieties available that are resistant to this disease; check to see if they are available from retailers in your area.

CHEMICAL CONTROL

The use of insecticides for the control of aphids that spread the virus is not recommended. The time is too short between an aphid sucking up the virus when it feeds on a diseased plant and spreading the virus as it feeds again on a healthy plant. By the time the insecticide has killed the aphid it has spread the virus.

Should growers wish to use an insecticide to kill aphids, use those given under Aphids (**see Fact Sheet no. 38**):

- 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.
- Plant-derived products, such as neem, derris, pyrethrum and chilli (with the addition of soap).
- Synthetic pyrethroids are likely to be effective, but will also kill natural enemies.

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 (2019) Lettuce mosaic virus (lettuce mosaic). Crop Protection Compendium. (<https://www.cabi.org/cpc/datasheet/30269>); and (Photo 1) Diseases of vegetable crops in Australia (2010). Editors, Denis Persley, et al. CSIRO Publishing; and Lettuce mosaic virus. Wikipedia. (https://en.wikipedia.org/wiki/Lettuce_mosaic_virus); Lettuce mosaic virus (Lettuce mosaic virus, LMV). GroVeg. (<https://www.growveg.com.au/plant-diseases/uk-and-europe/lettuce-mosaic-virus/>). Photo 2 Kohler F, et al. (1997) Diseases of cultivated crops in Pacific Island countries. South Pacific Commission. Pirie Printers Pty Limited, Canberra, Australia.

Produced with support from the Australian Centre for International Agricultural Research under project PC/2010/090: Strengthening integrated crop management research in the Pacific Islands in support of sustainable intensification of high-value crop production, implemented by the University of Queensland and the Secretariat of the Pacific Community.

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