

# Pacific Pests, Pathogens and Weeds - Online edition

## Tomato powdery mildew (314)

### Common Name

Tomato powdery mildew

### Scientific Name

*Leveillula taurica*. Other names are *Erysiphe taurica* and *Oidium sicula*. It exists as different strains. There are other powdery mildews affecting tomato. They are: *Oidium lucoopersici* and *Oidium neolycoopersici*.

### Distribution

Asia, Africa, North, South and Central America, the Caribbean, Europe, Oceania. It is recorded from Fiji (*Euphorbia* species), New Caledonia (capsicum, globe artichoke, tomato, *Tropaelum*), Papua New Guinea (*Drymaria*, *Euphorbia*, *Oxalis*), Solomon Islands (*Euphorbia* species), and Tonga (capsicum, *Euphorbia* species).

### Hosts

Tomato, capsicum, chilli, eggplant and others in the potato (Solanaceae) family, as well as members in the cotton (Malvaceae), onion (Amaryllidaceae), cucumber (Cucurbitaceae), legumes (Fabaceae), carrot (Apiaceae), and *Euphorbia* species (Euphorbiaceae) families, and more. It is particularly known as a disease of onion.

### Symptoms & Life Cycle

A major disease of tomato and many other crops, ornamentals and weeds. Generally, the lower leaves are infected first and then the disease moves up the plant. Whitish powdery patches of the fungus occur on the underside of leaves, causing mild distortions. Sometimes the fungus is restricted by the main leaf veins. On the top side of the leaf there are yellowish irregular-shaped spots, turning brown with age, and shrivelling. Unlike other powdery mildews, the fungus does not grow much over the leaf surface; it is inside the leaf, and the spores form on long stalks growing out of natural openings.

On the top surface of the leaves, the yellowish spots and patches look like those of tomato leaf mould (**see Fact Sheet no. 076**), but there are no velvety spore masses on the underside typical of leaf mould.

Spread is by spores on the wind. Germination and infection occurs at temperatures under 30°C, and at medium to high humidity. Powdery mildews do not need water on the leaf surface for germination, but humidity must be sufficient.

### Impact

A common and potentially serious disease during warm, dry weather. It can lead to loss of leaves, and early ripening and sunscald of the fruit (**see Fact Sheet no. 085**). In commercially grown tomatoes in the USA, yield losses may exceed 50%, depending on the age of the crops when the disease occurs, environmental conditions and effectiveness of fungicide control.

### Detection & inspection

Look for the yellow spots and patches on the leaves somewhat bounded by the main leaf veins. Look on the underside of the leaves for white patches of spores protruding through the surface (there is little cottony growth over the leaf blade with this powdery mildew).



Photo 2. Symptoms of tomato powdery mildew, *Leveillula taurica*, on the underside of a chilli leaf. Note the patches are bordered by the main veins.



Photo 1. Tomato powdery mildew, *Leveillula taurica*, on the upper leaf surface showing yellowish patches.

## Management

### CULTURAL CONTROL

Before planting:

- Avoid overcrowding of seedlings in the nursery, and check each for infection before field planting.
- Weed around the nursery, especially removing plants in the potato family (e.g., nightshade).
- Remove volunteer plants from the previous crop.

During growth:

- Do not apply excessive amounts of nitrogen fertilizer; abundant leafy growth promotes conditions for disease development.
- Choose open sites where there is good air movement around the plants.
- Ensure plants have adequate amounts of water as moisture stress may increase susceptibility.

After harvest:

- Collect all the trash and burn or bury it.
- Avoid over-lapping crops to prevent spores from older crops infecting newer ones at an early age.
- Practise crop rotation, choosing a non-host crop, e.g., root crops or those in the cabbage family.

### RESISTANT VARIETIES

Check company descriptions of varieties. Resistance has been found in cucurbits, chilli and onions, but note that there are strains of the fungus and crop varieties may not be resistant to all of them. And note, there are many species of powdery mildew and crops resistant to one may not be resistant to others.

### CHEMICAL CONTROL

Cultural control and the use of resistant varieties should be sufficient to manage this disease. If the disease is known to be a problem, and based on previous experience fungicides are likely to be needed, inspect the crop regularly to detect when infections first occur. Start spraying immediately symptoms are seen, and spray routinely every 7-10 days, depending on the severity of the disease. Do the following:

- For large commercial plantings, apply any of the following: (i) wettable sulphur products, (ii) chlorothalonil (also useful for gummy stem blight control of cucurbits) or (iii) check availability of other products (e.g., triazoles).
- If following an organic regime, use products containing horticultural oil, potassium bicarbonate or wettable sulphur. The last two are best applied before disease symptoms appear. Oils are eradicants, meaning they can cure plants that are already infected, but also have some protectant activity.
- Apply wettable sulphur in the early morning or evening, at the coolest times of the day. Never spray sulphur within 2 weeks of the last application of an oil spray. Also, sulphur can burn the leaves, so read the label carefully before applying. (Wettable sulphur has been used for many years for powdery mildew control.)
- Where the number of plants is small, use milk: normal strength milk diluted 1 part in 10 parts of water. Repeat at 7-10 day intervals, spraying in sunlight.

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*When using a pesticide (or biopesticides), 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 (2016) *Leveillula taurica* (powdery mildew of cotton) Crop Protection Compendium (<https://www.cabi.org/cpc/datasheet/30540>). Photos 1&2 (taken by Eric McKenzie), and used in this fact sheet, appeared previously in McKenzie E (2013) *Leveillula taurica*. PaDIL - (<http://www.padil.gov.au>).

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