

Extension Fact Sheet 63: Cucurbit Powdery Mildew



Common name: Powdery mildew of cucurbits

Scientific name: In Solomon Islands, and other Pacific Island countries, only the asexual state has been found; this is known as *Oidium*. The *Oidium* or asexual state of many powdery mildews looks the same. However, from research elsewhere, it is known that Cucurbit powdery mildew belongs to one of two sexual states: *Sphaerotheca fuliginea* or *Erysiphe cichoracearum*.

Hosts: Cucurbits: cucumber, melon, pumpkin, squash and zucchini. Some legumes and ornamentals are also susceptible.

Damage

The disease can be a major problem. Powdery mildews seldom kill their hosts, but use their nutrients, reduce photosynthesis, impair growth and reduce yields. Yields are reduced because the size or number of fruit declines, or plants die early. Early death of the leaves lowers market quality because fruit become sunburned, ripen prematurely, do not store well, or the flavour is poor. In addition, plants with powdery mildew are more likely to become infected with other diseases, Gummy stem blight in particular (see Fact Sheet No. 7).

Biology and Life Cycle

The fungus is unusual in that it cannot survive in the absence of a living host. It is also unusual in that it grows over the leaf surface, and that is the reason why the leaf appears white (photo, left: cucumber & right: pumpkin). In order to feed, the fungus sends special cells into the leaf and these extract the food it needs for growth. Spores, called conidia, are produced in chains on single strands of its cottony growth that stand erect from the leaf

surface. The spores are spread in the wind; they need high humidity to germinate, but not water. The time between infection and symptoms is short, 3-5 days (depending on temperatures). Spread is fast, especially if plants are close together, humidity is high, and there is no rain.

Signs and Symptoms

Look for white, powdery fungal spots on upper leaf surfaces, petioles and stems. Look for the fungus on the shaded older leaves. Infection on the under surface is often not as clear because of the lighter colour of the leaf; although on the pumpkin (photo, right) it is exceptionally clear. The fungal spots expand and multiply rapidly, so look for leaves that gradually turn yellow, then brown, dry out and die.

Management

Cultural control:

Cultural control measures are important to reduce the disease:

- Plant in sunny places, and, if possible, choose areas with good air circulation;
- Do not plant successive crops of cucurbits in the same gardens;
- Do not plant new crops next to those that have the disease; otherwise spread of the disease to the new crop will be rapid and devastating;
- Remove weeds from within and around the crop: many weeds are hosts of powdery mildew, so make sure they are controlled.

Resistant varieties:

- There are varieties of cucumber and melon with resistance. Check company descriptions of varieties of pumpkin and squash, and choose those with resistance.

Chemical control:

If fungicides are used, inspect the crop regularly to detect when infections first occur. Start spraying immediately, and spray routinely, every 7-10 days depending on the severity of the disease. **READ THE INSTRUCTIONS BEFORE USING ANY PESTICIDE.**

- 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.
- Wettable sulphur has been used for many years for powdery mildew control. Apply 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.
- Where number of plants is small, use milk: normal strength diluted 1 part in 10 parts water.
- For large commercial plantings, apply wettable sulphur products, chlorothalonil (also useful for Gummy stem blight control) or check availability of other products (e.g., triazoles), and seek advice from MAL extension officers.