

Extension Fact Sheet 47: Seedling diseases



Common name: Damping off

Scientific names: Commonly, *Pythium* and *Rhizoctonia* are involved, but *Fusarium* and *Phytophthora* may also cause similar diseases.

Host: Many kinds of fruit and vegetable seedlings show the disease in the nursery, with tomatoes, cabbages, and lettuces especially susceptible.

Damage

Seedlings are attacked by damping off fungi and water moulds (*Pythium* is not a fungus) either before they emerge (called pre-emergence damping off) or after (called post-emergence damping off). The first results in gaps in the rows of seedlings, whereas the second results in seedlings that fall over due to root rots and stem infections, often at soil level (photo, right). Those that survive the attack may be stunted, or grow slowly.

Seedlings that have strong stems, such as cabbages, do not always fall over; the plants have thin, twisted, discoloured stems (known as *wire stem*). If the infection girdles the stem, the seedlings die eventually.

Biology and Life Cycle

The fungi and water moulds involved in damping off are widely distributed in soil. They live on organic matter, but also on the roots of living plants as parasites. Most prefer wet soil conditions, and some have spores that swim in soil water, e.g., *Pythium* and *Phytophthora*. *Rhizoctonia* and *Fusarium*, by contrast, do not like waterlogged soils.

Plants that are growing poorly, because the soil is waterlogged or the temperature is unsuitable, are more likely to be infected by damping off fungi and water moulds, in contrast to those seedlings growing rapidly.

Spread of these fungi and water moulds occurs in water splash, on contaminated tools, in potting mixes and in infected plants.

Detection and inspection

Look for gaps in the row, and if present look to see if the seed is decayed. Look for seedlings that have fallen over due to soft rots on the stem or decayed roots. Look for lesions and cankers (open lesions) on seedlings with strong stems. Threads of the fungi involved may be present over the soil and seedlings (photo, left).

Management

Cultural control:

Cultural control is important. The following should be done:

- Sterilise the soil mix: a) heat the soil in an earth oven over hot stones covered in leaves or sacks for at least one hour, or b) place the soil mix in boxes or place it on the ground between bamboo sections, and pour boiling water over the soil;
- Keep the treated soil in clean bags until it is used, to prevent reinfection from water splash or contaminated tools;
- If outbreaks of damping off occur in seed beds, move the beds to a different site;
- Water soil and plants with rain water, not with water from ponds, streams, etc.;
- DO NOT overwater seedlings; ensure the seed boxes have good drainage
- Raise nursery seed boxes above ground level (at least 1 metre) to avoid rain splash from the soil;
- Always use a nutritious soil mix: rotten coconut mixed with soil is best. If using home made compost make sure it is well rotted before mixing it with the grated coconut. (See leaflet, *Growing lettuces, Chinese and English (ball) cabbage the organic way* by Joini Tutua).

Resistant varieties:

It is unlikely that in any one kind of vegetable there will be differences in the susceptibility of varieties to damping off.

Chemical control:

If cultural control methods fail, treat seed with a fungicide, such as thiram. Fungicides can also be used to treat seedbeds and/or seed boxes. See MAL for advice.

Note, *Pythium* and *Phytophthora* are not fungi; they are algae. However, to most of us they look like fungi, act like fungi, and can be managed like fungi.