

Lompoc

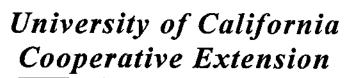
Row Crop Pest Management

Project



No. 14

Damping-Off Diseases



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IPM Information Series

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DAMPING-OFF DISEASES by Franklin Laemmlen

Damping-off diseases of seedlings are found worldwide and can be caused by several species of fungi under various weather conditions. The name damping-off is in standard use in the literature, and usually refers to the disintegration of stem and root tissues at and below the soil line. The plant tissues become water-soaked and mushy, and the seedling wilts and topples over. Damping-off disease, however, can have several phases. The fungi that cause this disease may attack the seed or the seedling before it emerges above the soil surface, causing a seed rot or pre-emergence damping-off. When this happens, the result is a poor stand which may be blamed on poor seed quality or seed maggots rather than the presence of a disease. The death of seedlings after emergence or transplanting is called post-emergence damping-off and is the condition most often recognized as damping-off.

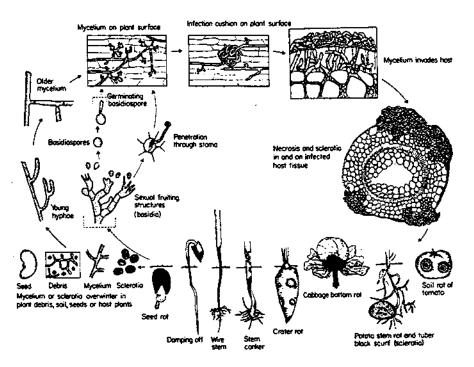
Most pathogens that cause damping-off can also continue to cause disease as the plant

grows to maturity. Root rot, crown rot, stem lesions, basal rot, crater rot, bottom rot, and stem girdling diseases may all be associated with damping-off fungi attacking mature plants.

The two fungi that are most often associ-

ated with damping-off in Central Coast crops are Rhizoctonia solani (disease cycle shown in Fig. 1) and Pythium spp. (disease cycle shown in Fig. 2). Rhizoctonia is found in most agricultural soils, where it survives between crops on crop residues and as microsclerotia (Fig. 1, 7 o'clock). This pathogen usually attacks seedlings at or near the soil surface. Initial symptoms are stem lesions, which are brick red to brown and sunken. If the disease progresses, the stem may be girdled. "Stem canker," "soreshin," "wirestem" and "damping-off" are names associated with Rhizoctonia seedling and young plant post-emergence diseases. Damping-off and wirestem are frequent

causes of transplant losses in cole crops on the



Central Coast.

Figure 1. Disease cycle of Rhizoctonia solani (Thanatephorus cucumeris).

Pythium spp. damping-off disease usually begins as a root rot. This group of fungi survive as oospores (Fig. 2, 7 o'clock) in the soil which germinate to attack root hairs and root tips causing a progressive deterioration of the root system. The seedling may wilt before above-ground lesions are evident or the seed may rot in the ground. Pythium is often present in pre-emergence damping-off. The Pythium may also progress into the lower stem and cause a mushy, watery stem and root rot which results in the typical post-emergence damping-off syndrome.

Other fungi, which are often associated with seedling or transplant damping-off, are Botrytis cinerea (see IPM Information Series No. 2), Sclerotinia sclerotiorum, and S. minor (see IPM Information Series No. 5), Alternaria spp. (see Information Series No. 13), Phytophthora spp., Fusarium spp., and Thielaviopsis basicola.

The environmental conditions which favor damping-off vary according to the pathogen. Rhizoctonia often causes injury to beans in the spring during germination. Cole crops transplanted in the fall often fall victim to wirestem

caused by Rhizoctonia. Sclerotinia and Botrytis damping-off can be severe during spring transplanting. *Pythium* spp. also tend to be most active during the spring months when soil temperatures are still cool and soil moisture plentiful.

Control of damping-off diseases is difficult during and after the disease has been identified in the field. Damping-off must be anticipated and prevented by using seed treatments and transplant treatments before the seed or plants are put in the field. In-furrow treatments at seeding and banded treatments over the plant line after transplanting can also be useful. Shallow planting of seed and seedlings so that less stem is exposed to the soil has been used to reduce losses from Rhizoctonia damping-off. Fungicides used for Pythium control, either as seed or seedling treatments, include metalaxyl, ethazole, some copper compounds, and captan. Rhizoctonia-caused damping-off may be suppressed with pentachloronitrobenzene (PCNB), chlorothalonil, benomyl, thiophanate methyl, carboxin, mancozeb, vinclozolin, and iprodione. Always refer to the product label for crop registration and dosage information.

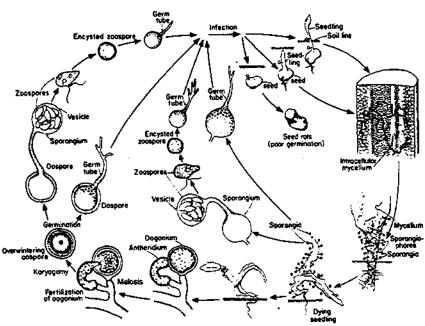


Figure 2. Disease cycle of damping-off and seed decay caused by Pythium sp.