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Lompoc

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Alternaria Diseases

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Alternaria Diseases

Diseases caused by *Alternaria* spp. are very common and are worldwide in their occurrence. Important plant hosts include crops as diverse as apples, broccoli, cauliflower, carrots, potatoes, Chinese cabbage, tomatoes, pak choy, and citrus plus a variety of plants used as ornamentals and a number of weeds.

Symptoms: Since Alternaria can attack almost any part of its host, symptoms vary according to the tissues invaded. In the leafy vegetables, symptoms of Alternaria typically start as a small, circular dark spot. As the disease progresses, the circular spots may grow to 1/2-inch in diameter and are usually grayish, grayish-tan to near black in color.

Fig. 1. Leafspot caused by *Alternaria brassicae*, showing the typical target spot composed of concentric rings.

Since the pathogen usually does not have a uniform growth rate, the spots often develop a target pattern of concentric rings within each spot (see Figure 1). Where host leaves are large enough to allow unrestricted symptom development, the target spots are diagnostic for Alternaria as there are few other pathogens which cause this type of symptom expression. Besides the target pattern, the lesion is also often covered with a fine, black, fuzzy growth. This growth is the Alternaria fungus sporulating on the dying host tissues. Many *Alternaria* spp. also produce toxins which diffuse into host tissues ahead of the fungus. Therefore, it is not uncommon to see a yellow halo which fades into healthy host tissues surrounding the target spot.

Dark, sunken spots are usually how Alternaria infections are expressed on roots, tubers, stems, and fruit. The fungus may sporulate in these cankers, causing a fine, black, velvety fungus growth and spores to cover most of the affected area.

The Pathogen: The spores of *Alternaria* spp. have some resemblance of a bowling pin with a cross-check pattern. In some species the narrow end of the spore is elongated, so the spore appears to have a tail (Figure 2).

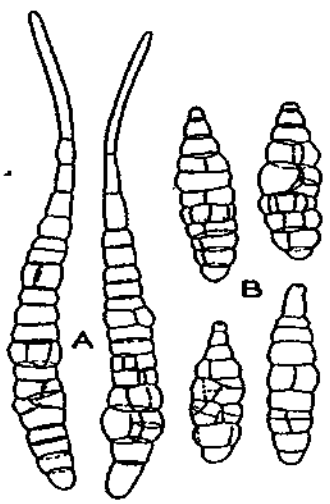

Fig. 2. Conidia of A, *Alternaria brassicae*, B, *Alternaria brassicicola*.

Alternaria spp. and the diseases they cause on specific hosts commonly found on the Central Coast include: *Alternaria dauci* — carrot leafblight, *A. radicina* — crown rot of carrot, *A. brassicae* — broccoli, cauliflower and cabbage leafspot, *A. solani* — tomato early blight and fruit rot, *A. brassicae* — broccoli headrot, *A. tenuis* and *A. alternata* — fruit spot on peppers, and *A. brassicicola* — leafspot on crucifers.

Biology: Plant pathogenic *Alternaria* spp. survive between crops as spores and mycelium in infected plant residues or in/on seeds. If the fungus is seed-borne, it may attack seedlings causing a damping-off, stem lesions or collar rot. Most often, however, the fungus grows and sporulates on plant residues during periods of rain, heavy dew or under conditions of good soil moisture. Spores are wind blown or splashed on to plant surfaces where infection occurs. The spores must have free moisture to germinate and infect. Penetration of the host can be direct, through wounds or through stomata (Fig. 3). Tissues that are stressed, weak, old or wounded are more susceptible to invasion than sound, vigorous tissues.

Disease Management: Suppression of Alternaria diseases can be accomplished in several ways. Some crop plant cultivars carry resistance. In crops, where the seed may be carrying the fungal spores, using disease-free seed or seed that has been treated can greatly reduce disease incidence in production fields. Crop rotation patterns in which susceptible crops follow non-host crops are a useful practice in reducing disease incidence. Crop residue destruction and weed control will also help reduce disease.

UV light has been shown to be essential for spore formation in *Alternaria* spp. Therefore, under greenhouse growing conditions, the use of UV light-absorbing film can greatly reduce the incidence of some Alternaria diseases.

Finally, there are a number of fungicides, which have excellent activity against Alternaria fungi. Chlorothalonil, maneb, mancozeb, and selected copper fungicides provide good control.

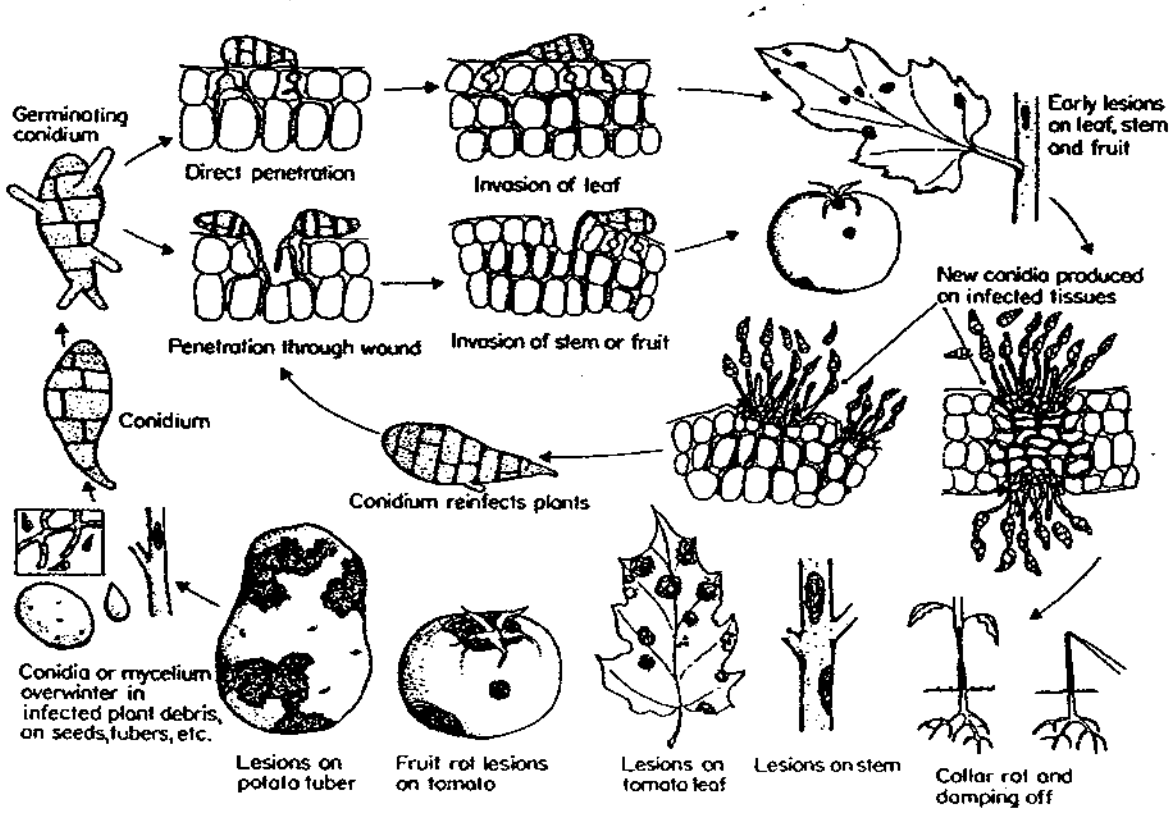

Fig. 3. Development and symptoms of diseases caused by *Alternaria*.

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