



## Pacific Pests, Pathogens & Weeds - Fact Sheets

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### Cabbage grey leaf spot (310)



Photo 1. Cabbage grey leaf spot, *Alternaria brassicae*.



Photo 2. Grey leaf spot, *Alternaria brassicae*, on cabbage. Note the concentric rings typical of *Alternaria* infections.



Photo 3. Grey leaf spot, *Alternaria brassicae* on cabbage.

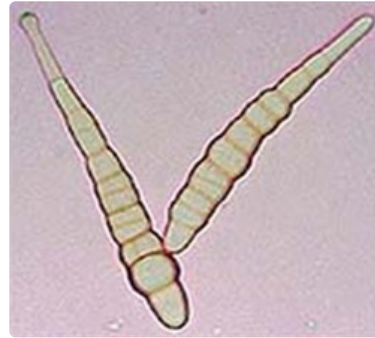


Photo 4. Spores of grey leaf spot, *Alternaria brassicae*. Compare with spores of *Alternaria brassicicola* (see **Fact Sheet 319**).

#### Common Name

Cabbage grey leaf spot

#### Scientific Name

*Alternaria brassicae*. Another *Alternaria* fungus, *Alternaria brassicicola*, cabbage black leaf spot, also occurs, and causes similar symptoms (see **Fact Sheet no. 133**). Microscopic examination of the spores is needed to distinguish between the two species (Photo 4).

#### Distribution

Worldwide. In temperate as well as tropical countries. Asia, Africa, North, South and Central America, Europe, Oceania. It is recorded from Australia, Guam, New Caladonia, New Zealand, Niue, Palau, Papua New Guinea, Vanuatu, and Wallis & Futuna.

#### Hosts

Members of the brassica family, e.g., broccoli, cabbage, cauliflower, mustard, oilseed rape, and cruciferous weeds. Chinese cabbages and mustards are especially susceptible to *Alternaria brassicae*.

#### Symptoms & Life Cycle

Grey leaf spots, circular or irregular, and mostly between the veins, occur on the leaves (Photo 2). The spots, up to 25 mm diameter, show concentric rings, giving a target-like appearance. The spots have a well-defined margin surrounded by a halo (Photo 1); and they are usually lighter than those caused by *Alternaria brassicicola*. Spore masses form on the lower leaf surfaces. As spots age, they become papery, and the centres fall out giving a 'shot-hole' appearance. Under favourable conditions (wet and warm, 20-30°C), the spots merge, causing the leaf to dry out and look scorched. Spots also develop on stems, leaf and flower stalks, and on seed heads. Dark,

sunken rots occur on the heads of broccoli and cauliflower.

Spread of the fungus over short distances occurs in water droplets splashed from infected plants to those nearby; further spread occurs in wind-driven rain, and in wind alone when the crop is harvested. Spread over long distances occurs on seed.

## Impact

A fungus is the cause of the leaf spot. It is an important disease, causing economic loss in several different ways. Its effect on seed is twofold: (i) seed infection causes both pre- and post-emergence damping-off (see **Fact Sheet no. 47**) leading to stem cankers of the survivors; and (ii) seed infection also affects the amount of seed harvested and its quality. On mature plants, the spots on the head and/or outer leaves are unsightly and reduce market price, as well as the time that cabbages and related crops can be stored.

## Detection & inspection

Look for the brown or grey leaf spots with concentric black rings - the target spot appearance is characteristic of this disease. Look with a x10 lens to see the velvety appearance of the spots on the lower surface of the leaf where the spores form. Look to see the "shot-holes" as the centres of the spots dry and fall away. But note that microscopic examination of the spores is needed to separate *Alternaria brassicae* (Photo XYZ) from *Alternaria brassicicola* (see **Fact Sheet no. 133**; Photo XYZ). Symptoms alone are not enough.

## Management

### CULTURAL CONTROL

Before planting:

- Treat seeds with hot water at 50°C for 25-30 minutes, and then dry them.
- Grow seedlings in soilless or pasteurized media in clean trays. Check regularly for signs of disease, and discard any plants with symptoms.

During growth:

- Plant cabbages apart so that air can circulate between them; this will help to dry the leaves and reduce the time that spores have to germinate and infect.
- Remove weeds from in and around the plots of cabbages (and related crops).
- Avoid overhead irrigation, especially from the time leaves start to show infections.

After harvest:

- Remove the remains of the crop after harvest, and destroy. Note, infections on the leaves produce spores until the leaves are completely decomposed. Alternatively, plough in the remains as deeply as possible.
- Rotate crops, leaving a 1-2-year interval between crops of cabbages (and related crops) planted on the same land.

### CHEMICAL CONTROL

- *Seed treatment*: Iprodione has been used as a seed treatment. Captan, or thiram can be used as alternatives.
- *In the field*: Fungicides used against *Alternaria* leaf spot include chlorothalonil, copper formulations, mancozeb, iprodione and members of the strobilurin group.

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Information from *Diseases of vegetable crops in Australia* (2010). Editors, Denis Persley, Tony Cooke, Susan House. CSIRO Publishing, and from Gerlach WWP (1988) *Plant diseases of Western Samoa*. Samoan German Crop Protection Project, Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) GmbH, Germany. Photo 1 Gerald Holmes, California Polytechnic State University at San Luis Obispo, Bugwood.org. Photo 2 Yuan-Min Shen, Taichung District Agricultural Research and Extension Station, Bugwood.org. Photo 3 Howard F. Schwartz, Colorado State University, Bugwood.org. Photo 4 (taken by Eric McKenzie), and used in this fact sheet, appeared previously in McKenzie E (2013) *Alternaria brassicae* PaDIL - (<http://www.padil.gov.au>).

Produced with support from the Australian Centre for International Agricultural Research under project PC2010/090: *Strengthening integrated crop management research in the Pacific Islands in support of sustainable intensification of high-value crop production*, implemented by the University of Queensland and the Secretariat of the Pacific Community.

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The mobile application is available from the Google Play Store and Apple iTunes.

