Black leg of cabbage and related plants

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Available at: https://researchlibrary.agric.wa.gov.au/journal_agriculture4/vol4/iss3/6
BLACK LEG is a disease which attacks many kinds of cruciferous plants. Under certain conditions it can cause serious damage. In Western Australia it has been recorded on cabbages, cauliflowers and kales. The dry rot form damages swedes.

If correct control measures are carried out black leg is not important, but faulty seed treatment and wrong rotations can lead to heavy losses.

**SYMPTOMS**

Any part of the plant can be attacked by black leg.

**Stems**

Early stem attacks appear as blackened dry areas, shown in Fig. 1. Oval areas (Fig. 2) appear as the disease advances. The centres of these lesions gradually turn to an ash-coloured grey.

The oval areas become studded with many black spots about the size of a pin point (Fig 3). These are fruiting bodies (pycnidia) of the black leg fungus.

The lesion may enlarge, causing complete girdling of the stem. Plants so affected will die.

**Roots**

When black leg attacks the roots the root system may be blackened and largely destroyed. New roots produced above the diseased area may keep the plant alive.

Plants badly affected on the roots may keep growing until a fair sized head has formed, then topple over when the decaying roots can no longer support the head weight.
The disease is usually introduced to clean areas by the use of untreated seed collected from diseased plants. When seeds carrying the fungus are planted in the seedbed they die soon after germinating. Water splashing the spores (fungus seeds) from these dead plants on to healthy ones spreads the disease in the seedbed.

If these infected seedlings are planted out the disease soon appears in the field, where it can be very destructive. Damage may be more severe if conditions are wet and drainage is poor.

Spread in the field often follows rain or sprinkler irrigation due to spores being splashed from diseased to healthy plants.

**CAUSE AND SPREAD**

Black leg is caused by the fungus *Phoma lingam* (Tode ex Fr.) Desm.

This fungus can be carried by seed, both on the outside of the seed coat and inside the seed. The disease is usually introduced to clean areas by the use of untreated seed collected from diseased plants.
2. Seedbeds should be established well away from cruciferous crops. The soil should be new or taken from areas that have not grown other cruciferous crops. Soil carrying the fungus can only be used if it is disinfected. Formalin solution, or methyl bromide are both good disinfectants to use.

After a diseased crop the ground carries black leg for several years, the number of years depending on the time required for the remains of old infected plants to decay. Healthy seedlings planted in the field straight after a diseased cruciferous crop will almost certainly become infected. Implements, tools and gardeners' boots may also spread the disease from infected areas to clean fields.

**CONTROL**

Black leg and the more common disease black rot are controlled by similar measures:

1. **Seeds must be hot water treated.**
   Steep seed in water at 122° F (≈ 50° C) for 25 minutes for cabbage and 15 minutes for all other cruciferous plants. Spread the seeds out thinly to encourage quick drying. Dusting with an organic mercury dust just before sowing gives added protection.
3. **Seedlings should be protected from water splash.** If seedbed covers are being used they should be applied during rainy weather to protect the plants from rain splash. Care to prevent splashing of seedlings during watering is recommended.

4. **Seedlings should be transplanted into the field as soon as possible.** Remove and destroy any plants showing black leg symptoms or stunted unthrifty growth.

5. **Practice a rotation including not more than one cruciferous crop in three or more years.**

6. The likelihood of disease is reduced if fields are kept clean. Remove and burn all stalks, butts and other residue of diseased crops. This will reduce the carry-over of the fungus in the soil. Encourage rotting of any root residue left in the soil by rotary hoeing it in. Tools and machinery from fields carrying black leg should be cleaned down before moving them to new areas. Do not feed remains of diseased plants to cattle. This would lead to spread of the fungus around the garden in manure.
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