Downy mildew of crucifers

G C. MacNish
DOWNY MILDEW OF CRUCIFERS

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DOWNY mildew of crucifers is of world wide distribution. In other parts of the world it has been recorded on a number of cruciferous plants, but to the present time this disease has only been recorded on cauliflower and cabbage in Western Australia.

Although mature plants are attacked, under local conditions most damage is done in the seed-beds. Here the young seedling can receive a severe growth check and in some instances may actually be killed.

Symptoms and Spread

The first symptom usually noticed on the young seedling is a yellowing or browning of the lower leaves. Closer examination of the leaf surface reveals a number of small brown spots about the size of a pin prick. Occasionally these marks have a light purplish halo. These spots are scattered over both surfaces of the leaf giving a peppered effect. The spots are usually more obvious on the under surface and here they may coalesce to form definite patches of diseased tissue. If the under side of the leaf is examined early in the morning before the leaves have dried it is often possible to see white tufts of fungus growing on the diseased areas. The name downy mildew is derived from these fungal tufts which give a "downy" appearance. If the disease is severe the whole leaf can become brown and papery.

Under field conditions downy mildew is rarely seen in Western Australia. When cabbage heads are attacked the disease causes numerous sunken black spots which vary in size from quite small dots up to about an inch in diameter. Occasionally parts of cauliflower curds are blackened by this disease. On exposure of the diseased area the white tufts of fungus can sometimes be seen growing from the affected tissue.

Downy mildew is caused by the fungus Peronospora parasitica (Pers. ex Fr.) Fr. This organism grows best and causes most
Close-up of a leaf (twice normal size) from a cauliflower seedling showing typical pepper spotting and white tufts of fungus (arrowed)

damage in cool damp weather. Most rapid development takes place when night temperatures of about 50° to 60° F. are accompanied by heavy dews and mild days. Under local conditions downy mildew is therefore most prevalent in the seed bed during the late autumn and winter months.

The disease may be initiated by special resting spores which remain viable from one season to the next. These spores which are found in trash from old crucifers or in soil where crucifers were grown in the previous year, cause infection of the young seedlings. From the point of infection, the fungus grows through the seedlings, producing characteristic white tufts of fungus on the seed leaves and stem. These fungal tufts carry many minute fungal seeds or spores which are easily dislodged and spread about by wind or water-splash. Those spores which alight on susceptible hosts when conditions are favourable for germination, produce new infections. When new fungal tufts are produced, the disease cycle is repeated, and further spread occurs.

Control

Under local conditions no control measures are justified in field plantings. However, during the autumn and winter months efforts should be made to reduce the incidence of the disease in the seed bed.
As prolonged moist conditions are most favourable for this disease, every effort should be made to avoid overcrowding of the seedlings in the seed bed and to keep the beds free of weeds. Cabbage and cauliflower seedlings are best sown in drill rows about 5 inches apart rather than broadcasted. This method gives the bed good ventilation, allowing quick drying after irrigation, rain or heavy dews and also makes weed control much easier.

Where mildew is known to have been severe in the past, regular applications of maneb spray, one ounce in four gallons of water, should be applied at three-day intervals during cool moist weather. This will help to protect the seedlings from infection. Here again the use of drill rows will facilitate proper coverage of the under surface of the lower leaves during fungicide application.

As the young seedlings can be infected by resting spores remaining in the soil from previous cruciferous crops, strict seedbed hygiene should be practised. Soil used in seedbeds should be new or, if this is impossible, it should be fumigated with Methyl Bromide in accordance with the maker's recommendations.

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