# PLANT PATHOLOGY NOTE NO. 28

# BLACK ROT AND LEAF SCALD OF CRUCIFERS

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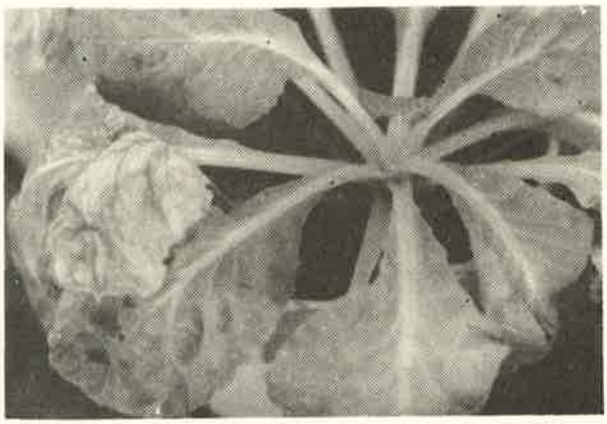
## INTRODUCTION

Most cultivated species of the cabbage family (Cruciferae) can be affected by the diseases known as black rot or leaf scald. These diseases are found in most parts of the word, but losses are often more severe in the hot, humid tropics. They are probably the most destructive diseases of the cabbage family worldwide.

Both diseases are caused by a bacterial plant pathogen (disease-causing organism), *Xanthomonas campestris*. Different strains of this bacterium infect a wide range of cultivated plants. The same strain of *X. campestris* is thought to cause both black rot and leaf scald in species of the cabbage family.

In Papua New Guinea, one or both diseases have been recorded on cabbage, Chinese cabbage, cauliflower, Brussels sprouts, broccoli and turnip. In other countries many weeds of the cabbage family have also been found to be affected by the disease.



*A young chinese cabbage infected with black rot*

*Leaf scald symptoms on Chinese cabbage*

## SYMPTOMS

The first symptom of <u>black rot</u> is the development of yellow, V-shaped areas at the edges of leaves. Leaf veins in these areas become blackened and the affected leaf tissues dry out and become brown. The black veins may extend down the leaf into the main stem. When the stem is cut off, these blackened veins are often clearly seen.

The first symptom of <u>leaf scald</u> is the development, between veins, of small, greasy, light brown, circular spots with a yellow margin. As the disease develops, the spots get bigger and join together to form large brown areas which dry out. These areas are easily torn, giving the leaves a tattered appearance.

The only difference between the two diseases is in the part of the leaf infected. In black rot, the pathogen infects mainly through the water pores at the edges of the leaf. In leaf scald, the pathogen infects mainly through the stomata (breathing pores) over the whole surface of the leaf.

## SPREAD OF THE DISEASES

The diseases are most often spread in infected seed. The pathogen can also survive on unrotted remains of diseased plants, and on some weeds on which it may not produce any symptoms.

If seeds are infected, they will grow into infected seedlings which will almost certainly not reach maturity. The diseases spread from infected seedlings or weeds to healthy seedlings nearby, by the action of wind and rain splash. In wet or humid conditions, the disease can quickly spread through the whole crop. Overhead irrigation may also help the disease to spread in the same way as rain.

## CONTROL

The standard method of controlling black rot and leaf scald has been to treat the seed, by soaking in hot water. This kills the pathogen and so prevents the disease from spreading via infected seeds. In Australia, seeds are soaked in water at 52°C for 25-30 minutes for cabbage and cauliflower; and at 50°C for 20 minutes for Brussels sprouts and broccoli.

It is very important to use the exact treatment times and temperatures recommended. Even if the recommended treatment is followed, some seeds may die, and the pathogen is not always completely killed.

In the nursery or in the field black rot and leaf scald can be reduced if the following measures are carried out:

- Sow in seed beds free from any unrotted plant remains
- Transplant into ground that has not been planted with crops of the cabbage family for at least 2 years
- Do not grow plants too close together, as this will help the diseases to spread from plant to plant
- Any diseased seedlings should be immediately removed from the nursery
- Plough in diseased plants immediately after harvesting and allow them to completely rot down before planting another crop.

## FURTHER INFORMATION

Further information about black rot and leaf scald can be obtained from the Chief Plant Pathologist, D.P.I., P.O. Box 417, Konedobu.

Copies of this Plant Pathology Note, and of others in the series, are available from the Publications Officer, Publications Section, D.P.I., P.O. Box 417, Konedobu.