PLANT PATHOLOGY NOTE: NO. 15

BACTERIAL WILT

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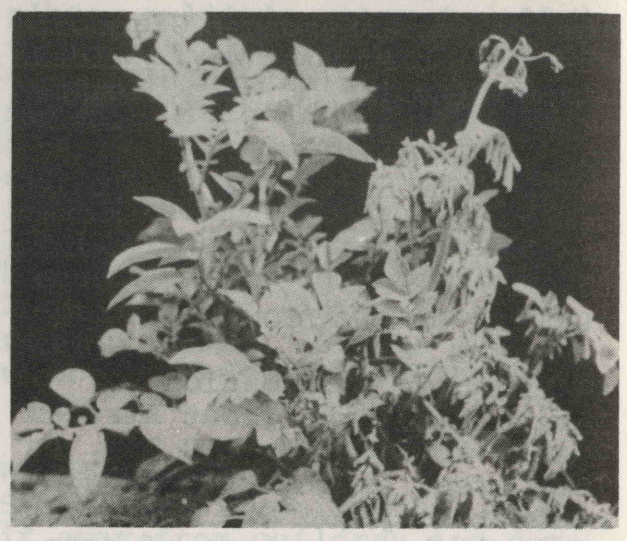
INTRODUCTION

Bacterial wilt can be a very serious disease of a number of crops grown in the warmer parts of the world. It is caused by a bacterium *Pseudomonas solanacearum* which exists as a number of different forms or races, each attacking a number of susceptible crops. The most important crops affected by this disease are banana, ground nut, tobacco, tomato, eggplant, pepper and English potato. Many other plants of minor economic importance are also attacked.



Early symptoms of bacterial wilt in potato. Some of the branches on the right are beginning to wilt.

SYMPTOMS

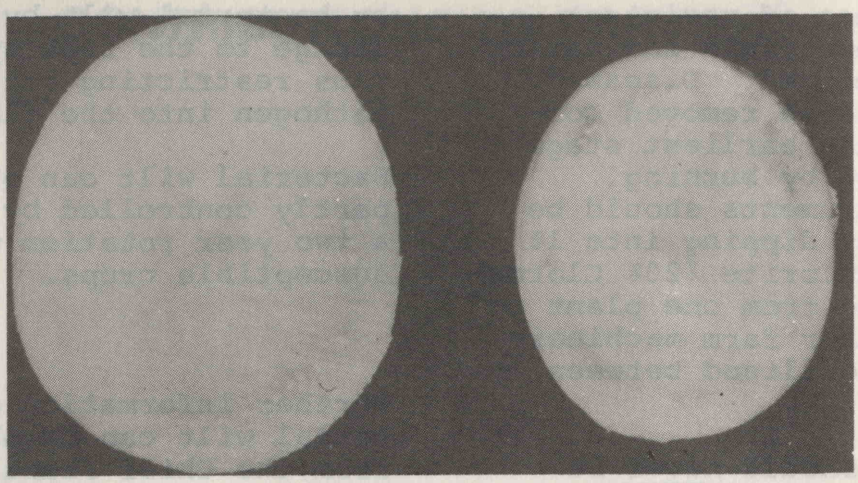
The first sign that a plant has been infected by this pathogen (organism causing a disease) is the wilting of a single branch or the leaves along the side of a single branch of the plant. This is caused by the pathogen partly blocking the water-conducting tissues to that branch.

Following the appearance of the first symptoms, further branches wilt one after the other, until the whole plant collapses and dies. Once infected, the plant cannot be saved.

If the stem of an infected plant is cut just above ground level, a brown discoloration of the internal tissues is seen. If the cut end of the stem is held just below the surface of water in a small glass container, a milky white ooze will leak from the end of the stem. This 'ooze' is made up of millions of bacteria. Similarly, if a diseased potato tuber is cut in half, a brown ring will be visible near the outer edge. When the tuber is squeezed, milky droplets exude from this ring.

SPREAD OF THE DISEASE

The bacteria normally enter the plant through the roots. However, in the banana the main method of spread is through insects passing bacteria between the above-ground plant parts. Where roots are damaged by insects or nematodes, infection can be much more severe.



Symptoms of wilt in potato tubers. Note the faint dark (brown) rings near the outer edges, with white droplets exuding from them.

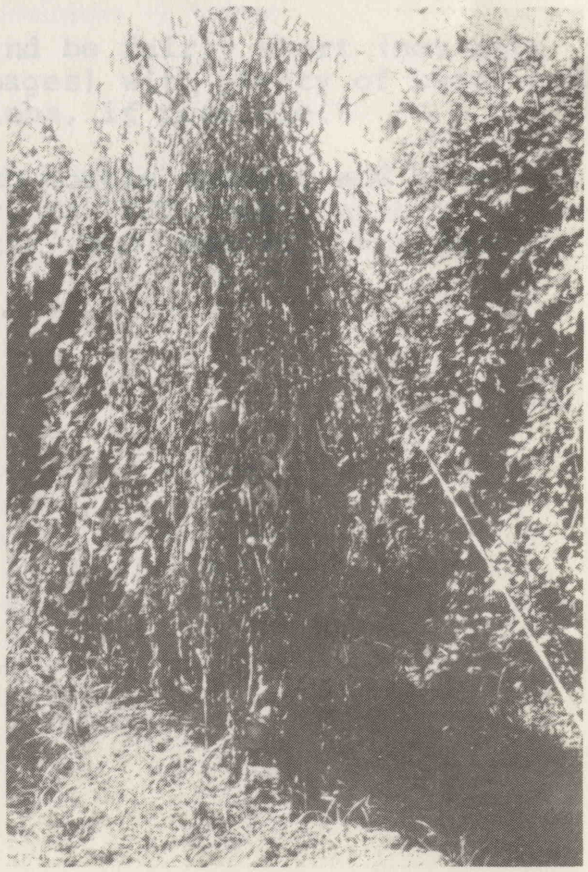
Infected pruning implements can also help the disease spread more quickly. During wet weather or when flood irrigation is used the disease can spread more quickly between root systems of different plants in the waterlogged soil. In potatoes, the bacterium can be spread from infected tubers. The infected tubers often show no outward symptoms of disease.

Once the pathogen has entered the plant it divides rapidly in the water-conducting tissues, which gradually become blocked by a mass of bacteria and slime. Passage of water to the plant parts above ground is prevented and this leads to the characteristic symptoms of the disease.

The pathogen can survive for a long time in the soil especially if diseased plant debris (rubbish) is allowed to remain in the soil. Such debris can act as a starting point for more infections.

CONTROL

The only really effective way to prevent bacterial wilt is to use varieties of crops that have inbred resistance to the disease. Resistant varieties of most crops except potato have been developed and some of these are available to the growers of this country.



The tomato plants on the right are healthy; those on the left are infected with bacterial wilt.

In the absence of resistant material, good field sanitation must be practiced. Diseased plants should be removed completely at the earliest stage and destroyed by burning. Pruning instruments should be sterilised by dipping into 1% sodium hypochlorite (20% Clorox) before moving from one plant to another. Other farm machinery should be sterilised between operations.

Seed potato should never be distributed from fields where the disease has been observed, because the tubers can still be infective even though they show no external symptoms.

Chemical control of nematodes and root feeding insects will often lower the losses caused by bacterial wilt by reducing damage to the root system, and thus restricting entry of the pathogen into the plant.

Bacterial wilt can often be partly controlled by at least a two year rotation with non-susceptible crops.

Further information about bacterial wilt 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.