PLANT PATHOLOGY NOTE: NO. 20

BARK CANKER OF COCOA

By C. Prior, Plant Pathologist, Cocoa Industry Co. Ltd,
c/o Lowlands Agricultural Experiment Station, Keravat, E.N.B.P.

INTRODUCTION

Bark canker is an infectious disease caused by the same fungus that causes black pod disease of cocoa, *Phytophthora palmivora*. It can infect and kill cocoa trees of any age but more often it is serious in trees over 10 years old because it tends to build up as trees get older. If it is not controlled it can kill trees very suddenly ('sudden death'), or more slowly, depending on the weather and the sensitivity of the trees to the disease.

Bark canker is a very serious problem in Papua New Guinea. It is a major cause of death in older trees - 'sudden death' can destroy a cocoa block before it is 20 years old. Bark canker is also a permanent source of the black pod fungus. Even after the driest weather, black pod infections will soon become serious when rain starts because the fungus spreads from cankers to the pods.

SYMPTOMS

Small cankers are very hard to spot. Many stay on the surface of the bark and do not develop into large and dangerous infections. When cankers become large and active the bark cracks vertically and a brownish-red liquid oozes out. In dry weather this hardens into black rubbery lumps. The liquid soon stains the bark black in the infected area and this is quite easy to see.

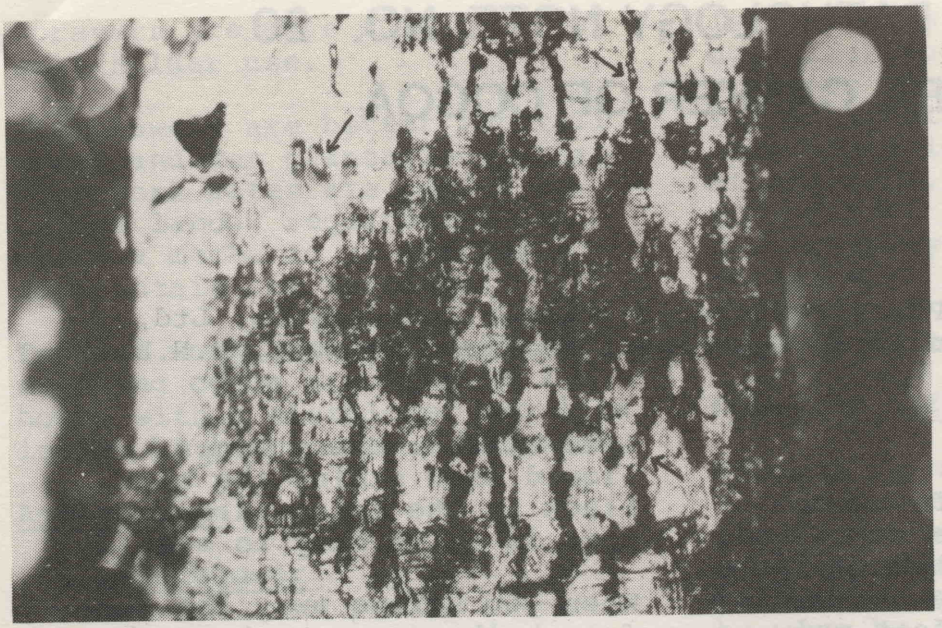
When you scrape away the surface bark over a canker, the infected bark underneath is brown or purple, usually with a sharp, irregular edge separating it from the paler, healthy bark. The edge may not be very clear if the canker is growing fast. Sometimes, scraping the bark reveals a lot more infection than was suspected.

HOW TREES BECOME INFECTED

It is important to recognise how canker infections start, because this can be the key to successful control. There are four main ways:

1. Through mechanical damage

This is the most important way in which trees become infected. Mechanical damage to cocoa trees is caused mainly by insect pests particularly longicorns and *Pantorhytes*. Trees attacked by these pests are at a high risk from canker infection. Canker spreads into the bark from insect channels and prevents the damage from healing. This is a major reason why these insects are such serious pests. Longicorns are particularly dangerous to young trees because they ring-bark them



An actively growing canker. Notice the drops of liquid (arrowed) oozing out of cracks in the bark

Canker (arrowed) around a channel in the bark made by a longicorn larva

near the base. This damage is serious enough by itself, but if the channel becomes infected by canker, the tree is very likely to die.

Canker can also start around other types of damage such as knife wounds. The fungus can be carried on harvesting hooks and therefore it may be possible to infect branches and flower cushions during harvesting but this is probably not an important source of infection.

Severe canker infection may occur around pruning wounds. This does not occur often, but a protectant paint of 3% red or green copper is worth considering if pruning is carried out in areas where canker is known to be a serious problem. The cost effectiveness of this measure is not known.

2. Through infected chupons

Chupons (water shoots) become infected very easily in wet

weather. The infection spreads through them very quickly, especially through the small ones which are easily missed in chupon pruning rounds. If the infection reaches the base of the chupon before dry weather returns, a canker will form in the bark.

3. From black pods

Infection can spread back to the flower cushions from infected pods. These infections may develop into cankers and kill the cushions. Over the years this can lead to a loss of cushions from the older parts of the tree. Sometimes the infection remains in the cushion without killing it but can grow out again and subsequently infect more pods.

4. Through apparently undamaged bark

Whether infections can occur through completely undamaged bark is not known. However, the spores of *Phytophthora* are very tiny and can enter through very small wounds, even those that are too small to see. The bark of older trees, though thick, is a mass of cracks and surface damage through which an infection might occur.

WHAT TO DO ABOUT IT

1. Control by improved management

Do everything possible to prevent the build-up of canker. Prune the edges of blocks, keep the grass cut, prune overshaded branches and lighten the shade. All these measures will increase the air flow and help to dry out the trees. *Phytophthora* likes it wet. Do not leave black pods on the trees because these can infect flower cushions. Prune out chupons regularly.

Most importantly, control longicorns and *Pantorhytes*. Put 1% Ridomil 25 wp (0.25% a.i. metalaxyl) into the channel paint mix. This will kill the insects and also eliminate the infections. See other articles in this issue for details about these insect pests.

2. Chemical control

Locate cankers and scrape them with a bush knife so that you remove just enough of the outer bark to find out how large they are. Do not try to cut them out. Paint them with 1% Ridomil 25 wp. This completely eliminates *Phytophthora* from the infection. Protection lasts about 2 months.

You can buy Ridomil 25 wp in small packets containing 50 g. This will make 5 litres (half a bucketful) of fungicide for painting cankers.

You cannot expect Ridomil to give miraculous cures if the infection has killed the inner bark. The bark grows from the inner layer. If this is killed the bark can only regrow inwards from the edge of the infection. This is a very slow process and may not be completed within the remaining life of the tree. If the tree has been ringbarked by canker it will only survive if the bark can grow back across the dead area after Ridomil treatment and before the crown dies.

In very severe canker attacks it may be quicker to treat the whole tree than search out individual cankers. The Ridomil should still be applied carefully - 1% Ridomil is too expensive to waste. Ideally, cankers should be found and treated before the whole tree becomes infested with them.

3. Resistance

This is being looked at for future hybrids. Good resistance to canker does occur in some clones.

FURTHER READING

Prior, C. (1979). Cocoa canker and sudden death. *Harvest* 5(2): 71-76.

Prior, C. (1980). A new treatment for bark canker on cocoa. *Harvest* 7(2), 92.

FURTHER INFORMATION

For further information and advice about bark canker of cocoa, you can contact:

The Chief Plant Protection Officer, D.P.I., P.O. Box 417, Konedobu (Tel: 214699)

or The Officer-in-Charge L.A.E.S., P.O. Keravat E.N.B.P. (Tel: 926251)

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.

STOP PRESS

A new type of Ridomil will soon replace Ridomil 25 wp. Please contact L.A.E.S., Keravat for the latest information