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CANKER STAIN OF PLANE, by D.A. Burdekin

Abstract

Canker stain is a serious disease of plane trees, especially London plane, in southern Europe and the United States which has not been recorded in Britain. The symptoms, biology and control of this disease are described.

Introduction

London plane (*Platanus x acerifolia*) is an important urban and roadside tree through-out much of Europe. In recent years (prior to 1980) there has been concern about the possible spread through the continent of a serious disease 'Canker stain', caused by the fungus *Ceratocystis fimbriate* f. *platani*. The disease was first identified in the United States in 1935, but was only recorded in Europe in the Lucca area of northern Italy in 1972. Since then it has been reported from a number of other places in the Mediterranean region including Naples in Italy, Marseilles in France and Barcelona and Valencia in Spain. In Marseilles some 1800 trees, out of an original population of 12,000 were killed over a twelve year period.

In southern Europe anxiety about the disease has led to the assumption that most deteriorating planes are suffering from canker stain where as there are many other causes of damage, including adverse soil conditions and diseases such as anthracnose. A detailed description of canker stain is given below so that arboriculturists may be aware of the symptoms of the disease and of the measures needed to control its spread.

Symptoms

The first clearly visible symptoms of canker stain include a dwarfing and yellowing of the leaves either over the whole or a part of the crown. However such symptoms usually become apparent only when fungal infection is far advanced. The primary symptoms of the disease are rather less obvious and are present on the trunks or branches.

On trees up to 30-years-old, the first signs of infection are slightly depressed and elongated areas of dead bark. These areas, up to 100cm long but usually no more than 5cm wide, are often associated with pruning wounds. During the first year, the infection may not be sufficiently noticeable to attract attention. In the second and subsequent years the areas of dead bark become wider and longer and separate areas may coalesce. Elongated cankers develop and the dead bark within the cankered areas becomes dark brown or black.

On mature trees, the first symptoms to become apparent are elongated dark blue or black strips of depressed bark, often in groups parallel to one another. As in younger trees, these symptoms are usually found close to pruning wounds. On pollarded trees a dark, discoloured strip may extend down from the cut surface and eventually reach the main trunk.

Observations in France have indicated that the margins of the cankers do not normally develop callus tissues. The dead bark within the canker remains attached for some time and cracks into small, more or less rectangular sections, rather than the much larger and irregularly shaped plates which occur in healthy bark. The fungus infects the wood beneath the diseased bark, causing a violet, bluish black or reddish brown stain. In cross section of the stem this stain is most intense in the medullary rays. The cankers finally girdle the branch or stem and the distal parts die. It is at about this stage that the foliar symptoms mentioned earlier will appear. Experience in the United States and in France suggests that the development of a girdling canker takes from 1 to 7 years.

The exact nature of the symptoms and their development depends on a number of factors including the age and condition of the tree and its previous history. Because diseases and disorders other than canker stain can cause some or all of the symptoms described above, a firm diagnosis can only be given following a thorough investigation and positive identification of the causal fungus.

Transmission of the Pathogen

The fungus is transmitted from diseased to healthy trees principally by the activities of man, most commonly during tree pruning operations. Research in the United States has shown that infection develops in many pruning wounds on previously healthy trees if the saw is first used on a diseased tree. Fungal spores or contaminated sawdust are readily transferred from one pruning wound to another. Further studies in the United States have shown that one of the most insidious methods of transmission is via certain bituminous pruning wound paints which contain either no fungicide or only an ineffective one. Contaminated sawdust is carried to the paint container on the brush following application to an infected wound and can then be spread to healthy wounds. A number of other less common means of fungal transmission were identified in the United States, including contaminated footwear, and even contaminated climbing ropes and ladders. Recent research in France has suggested that the disease may also be transmitted through root grafts but further evidence is needed to confirm this finding.

Control

Bearing in mind the methods by which the fungus can be transmitted it is clear that canker stain is a destructive disease which can be brought under control. The following practical measures have been recommended for control:

- a) Removal and destruction of diseased trees.
- b) Sterilization of pruning tools and equipment following use on diseased or suspect trees. In France it is recommended that saw blades and detached chains and guide bars should be dipped into or sprayed with methylated spirit and then flamed. Care must, of course, be taken to ensure that this operation is carried out under safe conditions. All other equipment should be thoroughly cleaned.
- c) If a wound dressing is necessary a suitable fungicide must be included in the formulation. Benomyl has proved effective in experiments conducted in the USA. (Note: Benomyl does not have approval for use in the UK in 2010)

The Risk of Introduction to Britain

Under current plant health regulations plants of plane (or any other tree species) imported from abroad must be inspected prior to export and certified free from dangerous pests or diseases. Whilst the risk of importing canker stain on plane trees is in any case very small, the official certification will provide an additional safeguard. The disease could also be introduced on pruning tools (including pocket knives!);

arboriculturists and others should therefore exercise great care in examining any diseased planes whilst on holiday or at work in southern Europe.

Any suspected cases of canker stain should be referred immediately to the Pathology Branch at Alice Holt.

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