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CROWN DAMAGE TO LONDON PLANE, by J N Gibbs

Summary

Crown damage to London plane may result from the toxic effects of de-icing salt and from infection by the fungus *Apiognomonium veneta*. The former is much the more important cause.

Introduction

1. London plane (*Platanus x hispanica* Muenchh.) is one of the most highly esteemed ornamental trees in Europe. It is particularly prized for its tolerance of atmospheric pollution and its ability to root in compacted and covered soil. However, during the last few decades there have been periodic occurrences of crown damage in established trees in London and other British cities and these have led to some concern over the future role of this tree in the urban environment. It is now clear that the principal cause of this damage is de-icing salt applied during severe winters. In addition, infection by the fungus *Apiognomonium veneta* can cause striking, if temporary disfigurement.

Anthracnose caused by *Apiognomonium veneta*

2. *A. veneta* (also known as *Gnomonia platani*) belongs to the group of fungi called the ascomycetes. Anthracnose can affect various parts of the tree and distinct phases are recognisable:
 - i) Leaf blight. Distinctive symptoms start to appear on the leaves in early summer. Portions of the main veins become blackened, and on either side of these develop brown, irregular, necrotic patches, variable in width.
 - ii) Bud blight. The fungus overwinters in the bark of the young twig invading and killing the tissues for a few centimetres around the bud so that it does not open in the spring. The dead bark tissues are bright orange-brown and contrast with the olive colour of the healthy parts. If the twig is not girdled a small oval canker develops at the infected node.
 - iii) Twig blight. This occurs when the fungus girdles the twig and thereby kills the distal portion. Sometimes infection may spread down from a terminal bud to cause tip dieback. Again the diseased bark assumes a striking orange-brown colour.
 - iv) Shoot blight. Sometimes the fungus overwinters harmlessly in the twig only to invade and kill expanding shoots in the spring. These suddenly wilt, die and shed their immature leaves. When large numbers of shoots are killed this is a very spectacular form of the disease.

3. In some years the effects of anthracnose can be very noticeable. However, recovery growth is usually excellent: trees which are almost leafless in June can be densely foliated by August. A fuller description of the disease is given by Strouts (1991).

Toxic Effects of De-Icing Salt

4. Common salt, sodium chloride, is frequently applied to roads and pavements during severe winter weather.
5. The range of symptoms that salt can cause in trees and shrubs is reviewed by Dobson (1991A). On London plane the following symptoms are typical.
 - i) Post flushing dieback. The first symptom of salt damage is the death of leaves immediately after flushing. These small dead leaves persist until the autumn and thus aid diagnosis of the condition. Whole trees may be affected, but more commonly symptoms are present only on some branches while other branches are fully foliated. It is not unusual for badly affected branches to bear a few scattered normal leaves. The bark and xylem of twigs on which the leaves have died remain fresh and green until at least mid-summer.
 - ii) Foliage scorch. From July onwards fully-expanded leaves show a yellow-brown discoloration between the veins and at the margin.
 - iii) Basal lesions. Strips of dead bark, sometimes extending from well below soil level to several meters up the stem, are often found at the base of trees showing crown damage. Within a year or so, the dead bark falls away leaving the xylem exposed.
6. Some salt damage to planes occurs in most years, but its severity is closely linked to the occurrence of harsh winters. Data (unpublished) from a survey conducted in summer 1991 indicated that in London some 11,000 roadside plane trees were showing symptoms following salt application the previous winter. About a quarter of these had post-flushing dieback symptoms affecting more than half the crown. The incidence of damage was higher along main roads than side roads, and was particularly high outside shops and other public buildings, indicating that much of the problem was due to manual de-icing operations. Prevention and amelioration of the problem is reviewed by Dobson (1991B).

Field Diagnosis

7. Some of the symptoms caused by the two damaging agents are quite distinctive, but some are similar and careful observation is necessary to identify the cause (see Table 1). It must be remembered that a tree can be affected simultaneously by both anthracnose and salt.

Table 1:

Symptoms	Damage due to <i>Apiognomonina</i>	Damage due to salt
Current year's shoots partially flushed but dead.	Bark around shoot base dead and bright orange brown in colour.	Bark around shoot base green and fresh until mid-summer.
Leaf discoloration.	Tissue along main veins is first to blacken and die.	* Tissue between veins and around leaf edge is first to die. Leaves appear scorched.

* The chloride level in salt-damaged leaves is usually between 1 and 3% of the oven-dry weight as compared to 0.1-0.3% in leaves from healthy trees.

Further Reading

Dobson, M.C. (1991A). Diagnosis of de-icing salt damage to trees. Arboricultural Research Note 96/91/PATH. Forestry Commission.

Dobson, M.C (1991B). Prevention and amelioration of de-icing salt damage to trees. Arboriculture Research Note 100/91/PATH. Forestry Commission.

Strouts, R.G. (1991). Anthracnose of London plane. Arboriculture Research Note 46/91/PATH. Forestry commission

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