



79	2012	
79	89	PATH

Arboriculture Research Note 79

Issued by the Arboricultural Advisory & Information Service

SCAB AND BLACK CANCKER OF WILLOW

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Summary

In some years Willow scab and Black canker cause serious damage to the leaves, shoots and young branches of several willow species. The diseases often occur together on the same tree and can easily be confused with each other. Repeated severe attacks can cause considerable dieback and in some cases may lead to the death of the tree. Chemical control may be necessary in commercial plantings but is rarely needed for ornamental trees. However, the currently approved chemical is for scab only.

Introduction

1. The two leaf and shoot diseases, Willow scab and Black canker, are very similar in most respects and therefore readily confused. The symptoms they produce are alike; they occur on more or less the same willow species; and, as they are both favoured by similar weather conditions, they often occur together on the same tree. Except where otherwise stated all that follows therefore applies to both diseases.

Symptoms

2. The overall appearance of trees affected by these diseases is of blackened shrivelled leaves on shoots which may have black, girdling lesions or appear completely black and withered. The earliest signs of the diseases, though, are the appearance on the young leaves and shoots of irregular, black spots. On the leaves these quickly enlarge to involve the whole leaf and leaf stalk and spread from this down onto the young shoots. Killed leaves shrivel and gradually drop and if shoots are girdled these die back. If conditions are right for the development and dispersal of the fungi, infections can be very numerous and spread the plant tissue very rapidly.
3. Minor differences exist between scab and Black canker in their symptoms. Black canker attacks leaves and shoots later in the season than scab and can cause cankers on larger woody twigs and small branches. Scab attacks leaves and only those shoots produced in the current year; tissues become less susceptible as they age during the season.
4. The effects of both diseases have been frequently mistaken for herbicide injury or pollution damage, especially with willows planted on or near agricultural land or industrial sites. Diagnosis of disease can be confirmed if the fruiting structures of the fungi can be found; but this usually requires laboratory examination and the scab fungus in particular tends to disappear later in the season.

The fungi and their spread

5. **Scab** is caused by the fungus *Pollaccia saliciperda* (= *Fusicladium saliciperdum*) which is the asexual or imperfect state of *Venturia saliciperda*. Although the sexual stage has been produced in laboratory cultures it has not been found in nature. The fungus overwinters as mycelium on dead twigs infected in the previous season. In spring the microscope spores (conidia) are produced in pustules (acervuli) on these diseased twigs and can then infect newly opened buds and young leaves. Shoots become infected when the fungus grows down through the leaf stalk. Spores are dispersed mainly in rain and dew. Small olive-brown

acervuli of *P.saliciperda* develop on the infected leaves, mainly along the veins on the undersides, and on the shoots. Under favourable conditions spores from these acervuli can give rise to secondary infections.

6. **Black canker** is caused by the fungus *Glomerella miyabeana* and its asexual or imperfect state *Colletotrichum gloeosporioides*. The fungus overwinters as mycelium or as fruit bodies (perithecia) of *G.miyabeana* in cankers and dead twigs infected in the previous season. In spring the pinkish (occasionally colourless) pustules of *C.gloeosporioides* develop in these cankers and diseased twigs alongside the minute perithecia embedded in the plant tissues. Spores are dispersed by water and infect leaves and succulent shoots. This newly infected tissue can produce acervuli which give rise to secondary infections. Lesions on current shoots and older twigs often arise at nodes where the fungus has grown down the leaf stalks. (Sinclair *et al* 1987).

Conditions favouring the diseases.

7. Persistent wet weather when leaves and shoots are being produced favours the development of these diseases. In the case of scab the greatest damage occurs during periods of cool, wet weather while Black canker spreads most rapidly when the weather is warm and wet. The onset of dry weather brings a rapid reduction in new infections of both diseases.

Susceptibility and resistance of willow

8. The taxonomy of the genus *Salix* has been in a confused state so species have numerous synonyms, many of which are still in regular usage. The names used here are from Meikle (1984). The relative susceptibility of willow species to these diseases is shown in the appendix. Of the resistant species the Cricket-bat willow, *Salix alba* var. *caerulea* is considered to be immune to both diseases, while the Weeping Pekin willow, *S. matsudana* 'Pendula' is also resistant to willow anthracnose (Rose 1989).

Control – General

9. As these diseases are so weather-dependant, trees badly damaged in one year may escape infection in another. Furthermore established willows can recover quickly from even severe injury.

Control measures for the professional

10. In commercial crops control may be desirable. Scab may be controlled using 'Topenco 100 EC' (Globachem). There is not a product approved for use against Black canker of willow.

Control measures for the amateur

11. In ornamental plantings chemical control is rarely warranted. However, there is not a product approved for amateur use against either Scab or Black canker of willow.

Before using a fungicide always read carefully the manufacturers instructions on the label (including any accompanying leaflet) and apply the chemical for the use, at the rate any by the method recommended paying particular attention o aspects of safety.

References

Meikle, R.D. (1984). *Willows and Poplars of Great Britain and Ireland*. BSBI Handbook No.4

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Published by:
 Arboricultural Advisory and Information Service
 Alice Holt Lodge
 Wrecclesham
 Farnham
 Surrey
 GU10 4LH

June 1989

Amended with minor alterations November 2012

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Appendix

Table 1: Susceptibility of willows to Scab and Black canker

<u>Species</u>	Scab	Black Canker
<i>S.alba</i> var. <i>caerulea</i> (Cricket-bat willow)	r	r
<i>S.alba</i> var. <i>vitellina</i> (Golden willow)	s	s
<i>S.</i> 'Americana' (American willow)	*	s
<i>S. Babylonica</i> (Weeping willow)	r	*
<i>S. caprea</i> (Goat willow)	mr	ms
<i>S.cordata</i>	ms	ms
<i>S.discolor</i>	ms	*
<i>S.fragilis</i> (Crack willow)	s	s
<i>S.matsudana</i> 'Pendula' (Weeping Pekin willow)	mr	mr
<i>S.matsudana</i> 'Tortuosa' (Twisted or contorted willow)	s	*
<i>S. x pendulina</i> var <i>elegantissima</i> (Weeping willow)	ms	*
<i>S. x pendulina</i> var <i>pendulina</i> (Weeping willow)	ms	*
<i>S.pentandra</i> (Bay willow)	r	*
<i>S.purpurea</i> (Purple willow)	r	*
<i>S. x sepulcralis</i> nothovar <i>chrysocoma</i> ¹ Common weeping willow)	ms	*

r = resistant; mr = moderately resistant; ms = moderately susceptible; s = susceptible; * = no information

¹ This is the most widely planted weeping willow, sometimes referred to, incorrectly as *S.alba* 'Tristis'.