

Bacterial spot of stone fruit

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Causes and Consequences

Bacterial spot is caused by the bacterial pathogen *Xanthomonas arboricola* pv *pruni*. Losses occur directly from infection of fruit. Up to half the fruit may be unsaleable on susceptible varieties. Additionally, extensive defoliation and twig dieback results in stunting and gradual loss of leaders from season to season.

Symptoms

Buds: Expanded buds become blighted, and may fail to unfurl.

Leaves: Leaf spots appear in spring as greasy or water-soaked angular areas (partially confined by leaf veins). Spots dry to a light tan colour then darken with age, becoming dark brown to black. As the leaves expand, diseased tissue separates from surrounding healthy tissue and may drop out to give a shot-hole symptom (Figure 1). This is easily confused with fungal shot hole caused by the pathogen *Wilsonomyces carpophilus* but the bacterial spot disease can usually be recognised by the oily sheen and angularity of young lesions.

The spots often join, and where infection is heavy, affected areas become pale yellow-green or reddish particularly along the mid-vein (Figure 2). Extensive spotting results in ripping and tattering of the leaves. Premature defoliation may occur.



Figure 1. Infected leaves with a shot-hole appearance



Figure 2. Bacterial spot infections join to give a reddish streak along the mid-vein

Stems: Small greasy lesions appear on the rapidly growing young branches in early spring. They become elongated, depressed and tan in colour (Figure 3). Cracks may form in the lesions and develop into open cankers from which gum exudes. Cankers may also develop during summer after leaf symptoms are well developed.

Stem cankers are rarely larger than 1-2 cm but, if numerous, may cause shoot distortion or dieback (Figure 4).





Figure 3. Lesions on young branches



Figure 4. Shoot distortion and dieback.

Fruit: Lesions appear in late spring as circular greasy spots which become sunken and darken as the fruit enlarges. The centre of spots frequently crack and may ooze gum. Roughened cork tissue develops on the edges of lesions as the fruit continues to expand.

Plums develop fewer, larger lesions (Figure 5) whilst peaches and nectarines develop numerous small spots (Figure 6), sometimes with deep cracking and pitting.



Figure 5. Infected plum fruit



Figure 6. Infected peach fruit

Prevention

No effective method for totally controlling this disease has been developed. Therefore preventing the disease from entering orchards is important.

Choosing species and varieties

Bacterial spot affects plums, peaches, nectarines and apricots. The most serious symptoms occur on plums. Although no varieties of plum are resistant some are more susceptible than others. Ask your nurseryman about the susceptibility of varieties before buying.

Orchard design

Orchards in exposed conditions are more vulnerable to attack by the disease than those in sheltered situations. Plant trees into sheltered sites where wind damage is low (but air movement is enough to prevent frost damage and allow rapid drying of the tree)

Overhead irrigation is a serious obstacle to disease control. Avoid irrigation systems that wet the leaves. Windbreaks should be planted because they reduce the chance of spread by windblown rain, however dense windbreaks can block spring and summer breezes which dry trees. Therefore make sure that the undergrowth at the base of windbreaks allows some gentle air movement.

Plant on heavier, rather than sandy soils. Reports in both Australia and overseas have observed that bacterial spot is more severe on heavier soils, compared to loam or heavier soils.

Susceptible trees should be planted in blocks adjacent to resistant varieties. This will minimise the possibility of bacterial spot spreading from infected trees to these newly planted trees.

Examination of nursery trees

On receiving trees from a nursery it is important to inspect them for cankers.

Pruning and shaping trees

Pruning to allow thorough spray penetration and more rapid drying of the canopy helps to reduce the severity of the disease.

Pruning of visible disease cankers is of little value in controlling the disease.

Fertility

Bacterial spot development should be minimised by maintaining adequate fertility in order to avoid excessive foliar growth or weakening of trees from poor nutrition.

Monitoring

When to look

Bacterial spot is a difficult disease to control. Control measures are rarely successful after symptoms are seen. It is important that orchardists monitor their entire enterprise throughout the season and are aware of how badly individual blocks are infected. This will allow planning for next season's activities.

Bacterial spot is a potential problem in regions with high humidity. Bacterial spot is favoured by periods of rain, heavy dews, hail, warm temperatures and high winds during the growing season. Be particularly careful with your monitoring during these times.

What to look for

[Table 1](#) is an approximate production schedule for plums and gives an indication of what symptoms orchardists should look for.

Control

In cases where bacterial spot has been a serious problem in previous years it is best to be cautious

There are no bactericides registered for bacterial spot in NSW. However if orchardists apply a full control schedule for leaf, curl, shot hole and rust which includes early season copper application it is likely to help to control bacterial spot.

Schedules for these diseases can be found in the [Orchard plant Protection Guide for Deciduous Fruits in NSW](#). Copper fungicides will have their maximum effect on bacterial spot when applied late, at budburst. However correct timing is necessary to avoid damage to emerging new growth.

ALWAYS READ THE LABEL

Users of agricultural (or veterinary) chemical products must always read the label and any Permit before using the product, and strictly comply with the directions on the label and the conditions of any permit. Users are not absolved from compliance with the directions on the label or the conditions of the Permit by reason of any statement made or not made in this publication.

WARNING

Pesticide residues may occur in animals treated with pesticides, or fed any crop product, including crop waste, that has been sprayed with pesticides.

It is the responsibility of the person applying a pesticide to do all things necessary to avoid spray drift onto adjoining land or waterways.

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Disclaimer: The information contained in this publication is based on knowledge and understanding at the time of writing (October 2005). However, because of advances in knowledge, users are reminded of the need to ensure that information upon which they rely is up to date and to check currency of the information with the appropriate officer of New South Wales Department of Primary Industries or the user's independent adviser.

Table 1. Production schedule

Budswell	Blossom	Mid-Season	Harvest	After Harvest	Dormancy
Bacteria ooze from active cankers and infect young stems and developing leaves		Fruit develops sunken, greasy spots which may ooze		Bacteria survive the winter months in dormant summer cankers	
	New cankers appear on twigs	Bud death	Leaves develop lesions, shot hole symptoms and become tattered.		