

Bacterial canker of stone fruit

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Causes and Consequences

Bacterial canker is caused by the bacterial pathogen *Pseudomonas syringae* pv *syringae*. *P. syringae* pv. *morsprunorum* is also present in Australia. This disease can affect all parts of all stone fruits although some are more susceptible than others.

Economic losses result from a reduction in fruit yield, and branches or whole trees dying. This is particularly the case in cherries which are the most severely infected species.

Symptoms

Trunks and branches: The bark is killed and when the sunken surface bark is removed underlying bark tissue is orange to brown, often with a strong sour smell. Copious amounts of gum may exude from the trunk and bark cankers. Dead areas of tissue become sunken as surrounding areas of healthy tissue continue to grow, resulting in the typical canker (Figure 1).

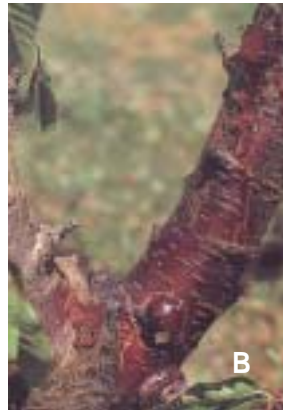


Figure 1. Typical cankers on peach (A) and cherry(B)

Peach trees can carry cankers not visible externally, but which will weaken the tree throughout its life.

Cankers girdle branches and kill them (Figure 2). There is often extensive suckering following infection.



Figure 2. Branches on a peach tree killed by bacterial canker

Shoots: Soft new shoots wilt and die back from the tips and turn brown. Cankers can form on shoots as a result of infection through the leaf scar (where leaf was attached - Figure 3).



Figure 3. A canker formed from an infected leaf scar

Buds: Dormant buds become brown and fail to break. Behind the bud, an area of dead tissue develops on the shoot. This area may be sunken and appear brown and damp underneath.

Flowers: Infection in spring causes flowers to turn brown and die.

Leaves: On younger leaves, infection appears as water soaked spots. As leaves age, the spots turn brown and drop out giving a 'shot hole' effect. Other symptoms can occur, such as thin, narrow, often rolled, yellow leaves particularly on peach and plum trees.



Figure 4. Cherry leaves showing symptoms of bacterial canker

Fruit: Infection causes sunken spots with dark centres and sometimes underlying gum pockets.

Prevention

Choosing species and varieties

All species of stone fruit are susceptible to bacterial canker. Cherries and apricots are more susceptible than peaches, nectarines and plums. Therefore in orchards prone to bacterial canker infection, avoid planting cherries and apricots.

Orchard management

- Avoid any damage to trees during the highly susceptible autumn period.
- Protect trees from wind-driven rain.
- Avoid overhead irrigation.
- Avoid using high nitrogen fertiliser rates in mid to late summer as this will encourage late season growth and soft tissue becomes infected as cankers become active.
- Do not damage trees when moving equipment around the orchard, particularly around headlands.
- Avoid wounds caused by sunscald by painting tree butts with white acrylic paint.

Control

1. Pruning

In badly affected orchards avoid pruning in winter when cankers are active. Winter pruning will spread the disease. It is recommended that:

- Pruning be delayed, possibly until as late as bud burst. This is particularly the case for young non-bearing trees, cherries and apricots which are highly susceptible or;
- Pruning should be done after harvest, well before leaf fall.

Bacterial canker can also be spread by pruning implements. Prune areas in the orchard with bad canker problems last and be sure to disinfect pruning implements frequently in an effective disinfectant (such as a 1 in 10 solution of household bleach). If pruning out discrete cankers on limbs, ensure the cut is at least 15 cm below the visible lesion.

Prune so that the weight of a heavy crop isn't likely to split the tree at the crotch. Splits create sites for canker infections.

Paint large pruning wounds, with white acrylic paint; particularly where canker has been a problem.

Bud-swell	Blossom	Mid Season	Ripening to Harvest	After Harvest	Dormancy
Pruning ¹				Pruning ¹	
					Remove badly infected young plantings ²
					Assess disease level in the orchard ³
					Control four-legged pests ⁴
					Protective Spray program

2. Remove badly infected young plantings

Don't neglect young trees (less than 4 years old). Winter is a good time to assess if recent plantings have bad bacterial canker infections. Pay particular attention if there has been hail. Treatment depends on the severity of the problem. If the problem is small to moderate, treat young trees as you would mature trees. If the problem is serious, consider pulling out the affected trees and planting healthy ones. Seriously infected young trees are unlikely to ever do well and will be a source of infection for the rest of the orchard.

3. Assess disease level in the orchard

Quantify the number of trees with the disease in your orchard every winter. Examine 20 trees in each hectare and record the number with bacterial canker.

This allows you to determine whether your control strategy is working and plan for next season.

4. Control four-legged pests

Wounds are prime sites for bacterial infection as well as for a number of other diseases. Try to minimise rabbit, hare and wallaby damage. Young trees can be severely damaged from early May through to late August. Place apple or plum prunings around headlands – these are very attractive to pests and help to divert them from trees. Scatter a fresh lot of prunings every 2-3 weeks. Another option is to cover the trunks with aluminium-coated paper. Staple the paper around the tree, foil side out. Plastic guards are also available commercially. Sound netting fencing may keep pest animals out.

Monitoring

When to look

Orchardists should look carefully at trees during winter to determine the number of active cankers. This will help to plan for next season. Pruning out cankers is only effective when there are relatively few of them.

Bud-swell	Blossom	Mid Season	Ripening to Harvest	After Harvest	Dormancy
	Cankers become dormant			Cankers form and develop	
Bud death noticeable	Occasional leaf infections				



MONITORING CRITICAL

Also consider the amount of rain during the growing season, as this spreads the disease through the orchard. In all but the mildest of infestations, pruning should be considered supplementary to a thorough spray schedule.

When considering pruning, there are two critical times for monitoring for bacterial canker:

Early to mid bud swell

- Check weekly
- Prune as cankers become dormant

After harvest but before leaf fall

- Check weekly
- Prune before cankers become active

What to look for

When monitoring the orchard look for rough cankers with amber coloured gum (Figure 5). Sometimes gum is not produced but when the bark is peeled back the flesh of the tree is fermented, brown and sour smelling. Look particularly hard around crotches.



Figure 5. An active canker on a Trevatt apricot tree

Beware

Increase the frequency of monitoring if:

- There are wet windy conditions in autumn before leaf fall.

Paint wounds if:

- The tree splits at the crotch.
- Trees are damaged by hares, wallabies etc. when cankers are active.

Spray as soon as possible if:

- Wind-driven rain and hail rip leaves off and damage bark when cankers are active.
- The orchard has a history of bacterial canker infection.

Protective spray program

Where conditions favour the disease, or disease levels during the last dormancy indicates heavy disease pressure, a full schedule of protective copper bactericide applications is recommended. This disease has the potential to seriously reduce yield and under conditions conducive to this bacterium a conservative approach is warranted.

Thorough spraying is essential. Aim to get the best possible coverage of the limbs. Details of recommended spray schedules are available in the [Orchard Plant Protection guide for Deciduous Fruits in NSW](#).

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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