

EastPack Update

4 September 2013

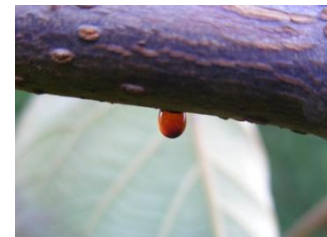
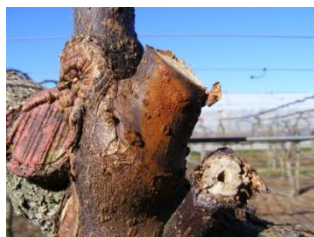
Dealing with Psa Cankers and associated symptoms in the Spring

By Tim Torr

What are Psa Cankers?

Psa cankers occur where Psa has survived inside the kiwifruit plant and conditions have become favourable to support the rapid growth of the Psa bacterium.

Typically Psa is relatively dormant in the plant over winter and until sap movement starts we see no symptoms. However as soon as there is some moisture, which happens to be loaded with carbohydrate, a rich food source, the Psa starts to grow very rapidly until it bursts out of the plant. These wet exudates are what we see as weeping cankers. The wet ooze is often coloured from being forced through woody tissue and can be coloured a cloudy white, through red to a very rusty orange colour.



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Why are Psa Cankers important?

Psa cankers are important because this is how Psa survives the winter in your orchard.

In the spring these cankers are evidence of Psa growing in these plants and this has occurred without a new infection cycle occurring.

Our Psa prevention strategies rely on measures which break the infection cycle.

Currently we have no way of dealing with Psa once it becomes established inside the plant, except to physically remove it.

Cankers can provide a concentrated source of Psa inoculum in your orchard.

How serious are Psa cankers?

Psa behaves differently in different kiwifruit varieties depending on how each variety is able to deal with the infection. Some Kiwifruit varieties seem to be very tolerant and others, particularly Hort 16A are very susceptible.

What are the differences?

- **Hort 16 A** is very susceptible and the canker can spread freely through the plant with little resistance.
- **G3** seems to be quite tolerant and appears to be able to cut off the infection and heal itself to a degree that we don't see in the other Gold varieties.
- **G9** seems to be between Hort 16A and G3 but probably closer to Hort 16A.
- **Gold males** can be the first to show signs of cankers in the orchard. Probably worse than G3 but not as bad as Hort 16A. M91 might be slightly worse than M33. Often the cankers are small and clearly defined.
- **Hayward** again at the tolerant end of the spectrum and it is relatively uncommon to see weeping cankers in Hayward.
- **G14** similar to Hayward
- **Chieftain** where the canopy is open and spray penetration good, cankers can be rare. Where they do occur the cankers tend to be small, clearly defined and not spread far.
- **Matua and M series males** more susceptible than Chieftain.

What do I do if I find Cankers?

If you are in:

- an **exclusion zone** or have no Psa in your orchard
Immediately remove all infected tissue being careful to disinfect, protect and seal any cut surfaces.
Contain all infected material in a plastic bag, double bag, seal and remove from the orchard for destruction by burning or burial.
Mark the plant with coloured paint or flag tape with the date written on it
Contact your EastPack grower services rep and KVH for further assistance.
- a **containment zone** or a **recovery zone**
Remove infected tissue as described below being careful to disinfect, protect and seal any cut surfaces.
Remove from the orchard for destruction by burning or burial.

Varietal differences when I find Cankers?

In G3; in exclusion zone remove all infected tissue and contact KVH.

Other zones: G3 often has the ability to slow the Psa infection with healthy growth coming away, and growing apparently normally, from very close to where the infection has been stopped. Where this is the case it would appear to be safe to leave the plant alone and allow it to deal with the infection in its own way.

The assumption is that you have an effective Psa protection program in place and the only risk is to the plant that has the infection. If you cut the plant out it is gone anyway, so there is nothing to lose by letting the plant have a chance.

If there is no evidence that the infection is slowing then the diseased tissue should be cut away and destroyed. Allow at least a 40cm margin of clear wood.

In Hort 16A or G9; in an exclusion zone remove all infected tissue and contact KVH.

Other zones: Cut out the diseased tissue as soon as it is found, taking care with tool hygiene, containing all of the diseased tissue in a plastic bag and cutting back to clear unstained tissue and then at least another 40 cm of healthy wood. Be very careful to make the last cut with a freshly disinfected tool, disinfect the cut surface and seal with a pruning paint.

In Hayward and Chieftain; in an exclusion zone remove all infected tissue and contact KVH.

Other zones: The cankers tend to be small and clearly defined. They seem to be sited in the bark tissue and are clearly defined by a dark stain. Cut away this stained tissue, making sure to get it all. Be careful to make the last cuts with a freshly disinfected tool, disinfect the cut surface and seal with a pruning paint.

What do I do if I find Cankers in the rootstock?

If they are just **isolated** cases, consider trying to cut out the canker especially if it appears to be small and clearly defined. If the diseased tissue is widespread within the trunk, prepare to remove the whole plant. Consult with your EastPack rep or technical advisor.

Where there are more than just a few diseased rootstocks in a block, consider replanting with a more tolerant rootstock.

Chinensis, and Kaimai are more susceptible to Psa than mature Bruno rootstocks. Seek advice from your EastPack grower services rep or technical advisor.

What do the cankers look like?

Cankers are different in some varieties

- **G3** often partitions off the Psa infection and the resulting canker has a clearly defined edge to it. If left untouched there is often a growth of healthy callous tissue around the margins and the plant may continue to function normally unless the cane or leader has been completely ring-barked.



- **Hort 16A** the cankers spread along the vascular tissue just under the bark and are often not clearly defined. They can be very long indeed, and narrow so that when they are being removed, it is necessary to cut into clear tissue beyond the obvious limits of the canker. Cut all the way round the removed limb to ensure there is no evidence of canker anywhere. Hort 16A can be tricky to remove; cut a significant margin (more than 40cm) of clear tissue if attempting to remove these cankers.
- **Hayward and Chieftain** cankers are at the other end of the spectrum. They tend to be small and well defined by staining in the tissue just under the bark. They seem to be self-contained and do not exhibit a tendency to spread far.



Prevention is by far the best strategy and the **Key messages** are still pretty much the **same**

- **Protect** your Orchard – use an effective Spray Program
- **Mark, Monitor** and **Deal with** cankers and other secondary symptoms.
- Enforce **strict hygiene** protocols

Hygiene protocols for orchards

Tools

Tools used to cut kiwifruit vines are potentially a high risk because they make direct contact with the vascular tissue of the vine.

The risk is of unclean tool contact vine to vine.

- Only clean tools should be allowed to be used on the orchard.
 - Consider having a set of pruning tools exclusively for use on each orchard. This will eliminate the risk of disease being brought to the orchard from somewhere else.
 - Otherwise ALL pruning tools must be thoroughly cleaned by soaking in a suitable sanitizer and any plant residues being scrubbed off before pruning starts
 - Alternatively a hot flame from a blow torch or similar can be used to sanitise the cutting surfaces.
- Pruning tools should be sanitised between plants.
 - Spraying with a suitable sanitizer or soaking in a bucket of sanitizer solution.
- Cut surfaces should be treated with a Psa protectant product as soon as practical after cutting.
 - Cuts of more than 10 or 12 mm should be treated with a suitable pruning paint.
 - Pruned blocks should be sprayed with a suitable Psa protectant product (Copper) as soon as is practical after pruning or at least before the next “High risk” weather event.



Vehicles and people

- Vehicles should keep to the formed tracks and not be free to be driven to any area where there is a risk of direct contact with vines.
- People should come to the orchard in a clean set of clothes.
- If they are coming to work on your orchard directly from another orchard, it is a good idea for them to bring and change into a fresh set of clothes.
- No children or pets should be allowed on orchard.

Summary

- Exudates are evidence that Psa is growing inside the kiwifruit plant.
- Exudates are where the Psa has burst out through the plant tissue.
- Psa exudates can be any colour from milky white through bright red to rusty orange.
- Cankers are evidence of Psa surviving the winter inside the Kiwifruit plant.
- We have no way of killing Psa once it becomes established inside the plant.
- Different kiwifruit varieties have different levels of tolerance to Psa cankers.
- Hayward, G14 and G3 are most tolerant and Hort 16A and G9 most susceptible female varieties.

- If you are in an exclusion zone, evidence of cankers or any other Psa symptoms must be reported to KVH and should be removed immediately.
- Cankers in Hort 16A and G9 can spread rapidly and should be removed with a buffer zone of clean tissue.
- Cankers in G3 can sometimes be left to heal themselves.
- Cankers in Hayward and Chieftain are often small, discreet and can be successfully removed if all stained tissue is taken out.
- When removing cankers make the last cut with a freshly disinfected tool, disinfect the cut surface and seal with a pruning paint.
- Some rootstocks are very susceptible and total replacement with a more tolerant variety should be considered.

Prevention is by far the best strategy

- **Protect** your Orchard. Use **Copper**, KeyStrepto and Actigard sprays.
- **Mark, Monitor** and **Deal with** cankers and other secondary symptoms.
- Enforce **strict hygiene** protocols.