

Bramley Orchard Canker Dieback – Spring 2021

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There has been a substantial amount of branch dieback and some general decline in bramley trees this spring. This is particularly widespread in orchards on dwarfing rootstocks (M9, M27), although a few trees on other rootstocks have also shown limited symptoms. The problem has affected both established orchards (older than 10 years) and new plantings (younger than 3 years). One observation made in previous years is that the worst affected areas are in low-lying sites with wetter soils.

Causes and Contributing Factors

Evidence suggests canker dieback arises from a combination of factors. There were a series of spring frosts combined with a prolonged dry period from late March through April (the Armagh region received 50% of average rainfall amount over this period). These environmental stresses coincided with physiologically active time on the trees' growth cycle. Although many orchards have survived fungal canker attack in the past and still continued to establish and crop well, it seems that the hard start to the spring season has weakened them, allowing any latent *Nectria* disease infection to express itself quite aggressively.



Classic symptoms of fungal canker damage on stems



White fruiting bodies normally seen in June/July, red bodies appear in autumn

Growers may also note sunken bud lesions on 1 year and 2-year old shoots. One explanation for this tip dieback is a secondary attack of bacterial canker (*Pseudomonas spp.*), which is present in all soils but normally has little ability to infect when orchard trees are healthy. Although primarily a disease of stone fruit, it has been noted as causing damage to apple trees in Europe. *Pseudomonas* is also a possible cause of 'blossom wilt' in other years but does not usually infect deep into the timber. It is spread by rain splash so wet autumns favour its reproduction and movement onto young shoots.

In addition, it seems that the bacterial cells of *Pseudomonas* can concentrate the freezing effect on plant tissue and cause more split damage and shoot death. The bacterium also produces a toxin as it grows in the plant cells, and this is the cause of the sunken bud lesions on stems that have not been frost damaged. Symptoms of bacterial canker on apples include the appearance of red pustules on the bark, and thick, gummy exudate at wound sites.



Red pustules



Bacterial ooze at infection site

Treatment and Control

Pruning

Pruning away all dead and damaged shoots and disposing of them correctly is good practice from the point of taking away infected tissue, but it is a time-consuming, laborious job, and there are 2 main risks with such action at this time:

- (a) the pruning wounds may not heal quickly enough to prevent further infection into the healthy tissue, and
- (b) pruning during the active growing season may put additional stress on the trees by prompting them to regenerate shoots prematurely.

Pesticides & Bio-fortification Products

With the loss of copper based fungicides that were effective against cankers, it is more important to maintain a good scab fungicide programme. This will suppress spore production from any canker lesions on the tree, and so limit further spread and limit storage rots. **Switch, Bellis and dithianon based products eg Delan Pro** are known to provide incidental control of canker. In addition, the inclusion of **bio-fortification products such as Fortify XD** may improve the plants ability to resist further infection cycles.

Against the bacterial pathogen *Pseudomonas*, **Amylo X WG** can be applied under **EAMU 0469/2018** which can offer some protection from *Pseudomonas* if present on the orchard. You can then include the removal of dead shoots in your winter pruning schedule at which time it will be clear where new, healthy growth is coming from.

Nutrition

There is evidence that well-nourished trees are less prone to *Pseudomonas* infection. Good nitrogen levels are important for improving an orchard's natural defences against this problem. However, the current severe infection arose because the orchards were subjected to a number of severe stresses in quick succession, so it is not advisable to sow any more fertiliser on affected trees at this time, especially if they are carrying a crop of apples. This is because absorbing sown fertiliser through the roots takes energy, and the trees may not be strong enough to cope with this extra workload. On affected orchards, feeding the crop through the leaf as much as possible is preferable.

Immediately post-harvest, it may be worth applying a high-dose foliar urea spray (e.g. up to 50kg/ha) to rapidly build up the trees' nitrogen levels in the buds and shoots, without 'softening' timber or raising the risk of *Nectria* fungal infection. It appears that good N levels also help suppress the toxin production of *Pseudomonas* bacteria.

In the worst situations at present, where there has also been a degree of root stress and compromise due to the extreme weather conditions. Hope there will be sufficient rainfall in the near future to assist root recovery and nutrient uptake.

One consideration in this regard is to apply irrigation if sustained dry weather returns, especially on young orchards.

If it is feasible to apply organic matter (e.g. aged manure or rotten spent mushroom compost) round affected tree bases, this would be very beneficial in the long term, as the soil structure will be improved, beneficial microorganisms will be encouraged and the nitrogen release from this source will be gradual. It is important to focus on 'nursing' the orchard through recovery.

Conclusion

The actions outlined above will give the orchard its best opportunity to recover from the current infection but regrettably there is no guarantee of saving all the affected trees, as the seasonal conditions during the summer will greatly influence their ability to recover and regenerate healthy wood.