

Habitat hosts of Queensland fruit fly

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- Fruiting plants growing in non-production areas and property perimeters are ideal hosts for Queensland Fruit Fly (QFF)
- Berry growers are encouraged to remove or manage these key risk areas to improve their overall QFF management and prevention outcomes

Beneficial Insect Refuge or QFF Breeding area?

In the non-production areas and property perimeters, the debate comes down to evaluating the benefits of shelterbelts, food for native pollinators and homes for beneficial insects versus the benefits of QFF host management – as QFF will habitually seek refuge in these areas too! They are an insect found in the native forests of Queensland after all. A key difference is the requirements of QFF in this area – that is the “fruit” available for “breeding” in these areas.

Targeting weedy fruit host plants in these areas will help prevent and manage QFF, and areas can then be improved to just host beneficial insects.

There are the added benefits of also reducing other crop pests, e.g. thrip, aphids, white fly, mites, carpophilus, mirids and shield bugs (plus birds, rabbits and deer!) using this approach.



Figure 1. A Queensland Fruit Fly on Rubus fruit. Photo credit: insectsandorganicgardening.com.au

Management of the fruiting plants

A surveillance grid coupled with visual observations will typically indicate QFF incursions starts at the extremities of a monocrop near to QFF habitat, then moves inwards (common with many invasive insect pests). In crops where there is a break in the habitat cycle (dormancy or crop removal) there is not any reason for the QFF to hang around in the crop area. QFF's return into fruiting crops is usually reliant on its ability to survive or seek refuge elsewhere until the next crop is ready to harvest (or infest in the perspective of the QFF). This "QFF refuge area" can be plants and foliage or buildings and other protected areas. These non-production areas are often surrounding commercial crops, and the management of these areas can benefit crop management.

The distinguishing factor between beneficial insect populations and QFF populations, is the ability for QFF to breed in fruiting bodies of the weeds and plants in these areas.

Blackberries are a major culprit for providing a QFF breeding environment close to commercial fruit production areas, accompanied by loquats, plums, apples, pears and quinces, Wild Tobacco, in some cases Kangaroo apple, and there are even cases of wild roses (rosehips can host QFF).



In most cases, (all except for Kangaroo apple), these species are weeds in these areas, and all can thrive in these unchecked and unkept 'bush' areas or 'creek/dam' edges, along with fence lines, and neglected roadside verges on property boundaries.

Controlling fruit fly at season end and season start... and starting where the habitat is conducive to hosting QFF

Reducing QFF host opportunities in non-production farm areas is a key "good farm hygiene" element to QFF prevention and management.

- Starting QFF control before QFF are active, minimises the QFF spread and subsequent impact to production areas, a good strategy in reducing the volume of chemical used, the *area requiring treatment* and the time taken to apply the chemical controls. A zero or low QFF population presence also reduces the chemical impact on beneficial insects in the fruit crop during the season.
- QFF prevention using host reduction techniques and early targeted chemical management can shift the farm labour requirement into the early season tasks, reducing the time required for QFF control in the busy harvest periods when labour is in high demand.



Figure 2. Feral Blackberries are a host of Queensland Fruit Fly. Management of this fruiting host plant will assist QFF prevention and management in the commercial production environment. Photo credit: Bronwyn Koll



Figure 3. Feral Loquats and Wild Tobacco are hosts of Queensland Fruit Fly. Management of these fruiting host plants will assist QFF prevention and management in the commercial production environment.

Photo credit: Fruit Fly Murray Valley, Yarra Ranges Council

In the Yarra Valley, where QFF have been detected early, intensive QFF surveillance for 5 years has shown that areas where these undesirable weed host plants have been managed well, QFF have not been detected again. In areas where QFF have been found as part of the early detection program over the last 5 years, in most cases there is an abundance of unmanaged feral blackberry and these QFF detections are occurring in line with the blackberry fruiting season (starting in January and peaking in February and March).

The Victorian Blackberry Taskforce (VBT) is currently in the process of independently investigating the correlation between feral blackberry and QFF populations. Preliminary studies have indicated that QFF have been reared from wild blackberries collected from locations where QFF are prevalent.

Strategies for removing blackberry and other weedy QFF host plants

Obviously host removal needs to be done with sensitivity to protect native flora and fauna, keeping in mind the benefits of these areas for hosting native pollinators and insect pest predators. A blackberry action plan is often multi-year plan and tasks are usually completed in key stages:

1. prioritising areas for control
2. carrying out removal
3. re applying controls
4. revegetation with desired species to suppress blackberry re-infestation (that can be critically selected to provide native pollinator and pest predator habitat)

“ The most important message to a weed removal program is the same as for a QFF management program, “use a suite of tools to reduce the target pest numbers, start early and get neighbours involved” .



Figure 4. A Parks Victoria area in Pheasant Creek where goats were grazed as part of a blackberry management program. The goats have eaten the leaf off the plant improving access and reducing blackberry plant viability. This is a multi stage strategy for blackberry control. Photo credit: Bronwyn Koll

The VBT has supported a blackberry removal program in the Kinglake region's Pheasant Creek. In conjunction with a concerted effort on local Council managed roadsides in the target area and a Parks Victoria "Good Neighbour" grant, the VBT's Pheasant Creek Blackberry Action Group has engaged about 25 out of the targeted 56 property managers to improve blackberry management in the area.

The most significant change over time has been the application of "GrazeAway" goats in a heavily blackberry infested Parks Victoria area, where environmental sensitivities were addressed, and the blackberries were eaten and trampled to ground level. Access is now improved, and Parks Victoria will now carefully target blackberry re-growth whilst protecting native plants. An immediate benefit was the consumption/destruction of blackberry fruit, reducing QFF risk to the berry producers in the area.

The mechanical removal of large areas of blackberry is a major task, but has significant impact on reducing large areas of blackberry fast. The cut (and mulch) and paint technique using a track wheeled machine for difficult to access areas is an economical and safe approach on tricky terrain. The chemical control of large areas of blackberry can also have a similar impact on blackberries.



Figure 5. A goat from "GrazeAway" showcasing their skills for eating the problem away at a VBT demonstration event. Photo credit: Bronwyn Koll



Figure 6. Ecoblade, “cutting and painting” a problematic blackberry area, in preparation for either a return to pasture or a revegetation program. Photo credit: Bronwyn Koll



Figure 7. Chemical control of large areas of blackberry or inaccessible areas with a drone is an emerging technique. Permits are required to apply chemicals with a drone. Ensure chemical label directions are adhered to.

Photo credit: Bronwyn Koll



Figure 8. Removal of weed species that host QFF breeding adjacent to cropping areas is essential to slow the spread of QFF and reduce risk. Permits are required to remove vegetation from roadside verges.

Photo credit: Bronwyn Koll

With all of the chemical, mechanical and animal removal of blackberry options, follow-up actions are required to prevent blackberry regrowth, but each time the task becomes significantly smaller.

Targeted removal of unmanaged trees is also required for good QFF prevention and management. Trees or plants with QFF host fruit support QFF breeding, and will provide a safe habitat for QFF even without fruit. The fly will move from safe habitat to a fruit crop fruit as needed. Trees that are removed should also be stump-painted or managed to prevent regrowth.

Summary

- Managing and preventing Queensland Fruit Fly is a complex task, especially when also protecting *Integrated Pest Management* in crops.
- Each prevention step taken reduces QFF risk by lowering QFF population and chance of survival.
- Removal of non-commercial fruit fly hosts on or near production areas is part of industry's QFF best management practice "good farm hygiene" guidelines for commercial producers, and a significant aspect of the formerly used interstate trade protocols for trade of fruit from a known fruit fly risk area to a QFF sensitive market.
- The other benefit from removing or better managing fruiting plants growing in non-production areas and property perimeters is the reduction of other crop pests.
- It is vital that all land managers remove or reduce unmanaged fruiting plants for good QFF prevention and control.

