

Research results from cane fruit crop protection project

AHDB is funding Project SF 158 to investigate some key diseases and pests of raspberry and blackberry and develop novel approaches to controlling these where appropriate. The project has been running for four years and enters its final year in the 2019 season. Here we summarise some of the key findings for growers to date, some of which growers can adopt in the 2019 season. These findings are heavily abbreviated summaries with no scientific background or detail included in this document. The higher level of detail can be found in the latest reports of SF 158 on the AHDB Horticulture website.

Improving our understanding of *Phytophthora rubi*

The project assessed novel plant treatments and root health. Prestop and coded products were compared to Paraat. However, no primocane death occurred, so no conclusions could be drawn. It was found however that Prestop and three coded products significantly increased the number of primocanes compared to the untreated control and Paraat treated plants.

Trials have been done comparing potted raspberry plants which are either cold-stored over winter or held in ambient conditions. Both the cold stored and the ambient potted canes were treated with Prestop, Serenade ASO or Paraat either in the autumn (half the canes) or in the spring (half of the canes) before being artificially inoculated with *P. rubi*. In the autumn treated canes, there were significantly more red roots (symptom of *Phytophthora* infection) in cold stored canes than those held in ambient conditions. In the spring treated canes, there was significantly more *Phytophthora* cane disease symptoms in cold stored canes than those held in ambient. The conclusion drawn so far is that cold stored canes appear to be more prone to developing *Phytophthora* than those held in ambient.

Key results so far:

- Cold stored potted raspberry canes appear to be more prone to developing *Phytophthora* than those held in ambient conditions over winter.

Controlling two-spotted spider mite in parallel with SWD

Investigations have been made on the effects of SWD control sprays in raspberry on the populations and control of two-spotted spider mite. It was confirmed that the sprays commonly used for SWD were having a detrimental effect on populations of predators and that spider mite populations were increasing as a result.

Research using overhead spray applications of control products on primocane raspberry from horizontal gantries using larger droplet sizes led to higher numbers of natural enemies. This resulted in lower populations of two-spotted spider mite. It was concluded that the larger droplet sizes afforded refuges on the undersides of raspberry leaves for the natural enemies allowing them to survive.

Research found that when *Phytoseiulus persimilis* predators were introduced early in the season to protected primocane raspberry, spider mite populations were under control by early August and although Decis (applied for blackberry leaf midge control) reduced predator numbers, effective control of two-spotted spider mite had already been achieved. It should be remembered that *Phytoseiulus persimilis* will only thrive early in the season if used in conjunction with spray products which are compatible with this predator.

Work was done on protected primocane raspberry to find out if the use of sprays of pollen over the crop canopy early in the season before flowering to feed natural enemies, might help to boost their populations. It was found that the numbers of *Amblyseius andersoni* in tunnel grown primocane raspberries did increase, but there was no impact on the level of two-spotted spider mite control.

Key results so far:

- Sprays commonly used for SWD control result in an increase in two-spotted spider mite populations in raspberry.
- Use of overhead sprays using larger droplet size provides refuges for spider mite natural enemies, enhancing natural control.
- Early and repeated introductions of *Phytoseiulus persimilis* when used with compatible spray programmes provides good control of two-spotted spider mite before the onset of SWD control sprays.

Spray application trials in primocane raspberry

Spray deposition work was done to identify whether currently available spray machine settings can be used to provide refuges to beneficial insects. It investigated deposition on leaves using commercial practice of 50% and 100% air-assistance and very fine spray quality compared with medium spray quality. Greatest coverage, which was less than 50%, occurred at the top of the canopy and lowest coverage, 10%, occurred in the inner and lower crop canopy. No 'stand out' spray setting was identified.

Very low volumes of spray deposits were found in the inner and lower crop canopy with and it was concluded that these areas provide possible refuges for beneficial insects.

Key results so far:

- Commercial spraying of primocane raspberry crops tends to provide poor coverage of the middle and lower crop canopy, providing refuges for introduced and naturally occurring predatory insects.

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