

POTENTIAL FOR FENPROPATHRIN (DANITOL) AS AN ALTERNATIVE TO BIFENTHRIN (BRIGADE) AS A CLEANUP SPRAY IN RED RASPBERRY

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Bifenthrin is the industry standard cleanup spray in red raspberry. It is a pyrethroid with broadspectrum activity against both insects and mites. Fenpropathrin is also a pyrethroid like bifenthrin, and is known for its long residual activity against SWD infesting another small fruit, blueberry. The current industry 7-day spray interval for SWD is unsustainable but so far no alternative has been identified, which could potentially reduce the number of sprays/season and still maintain maggot-free berries. SWD bioassays have indicated Danitol® 2EC, exhibits long field residual in blueberry but nothing is known about its persistence in red raspberry. While long residual activity is normally a desirable quality, persistent residues may trigger MRL violations if they are above target market tolerances. We performed an MRL degradation study to determine the levels or ppm at 0, 3, 5, 7, 14 and 21 days after treatment (15 June) (Figs. 1 & 2). Bioassays were performed using SWD from the WSU NWREC colony to test residual efficacy of foliar applications (Fig. 3).

Figure 1. ppm Danitol (fenpropathrin) detected over 3 weeks.

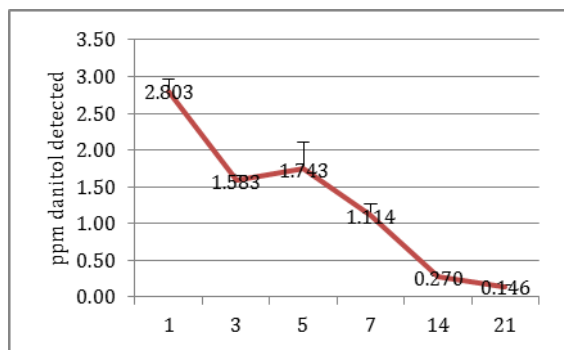
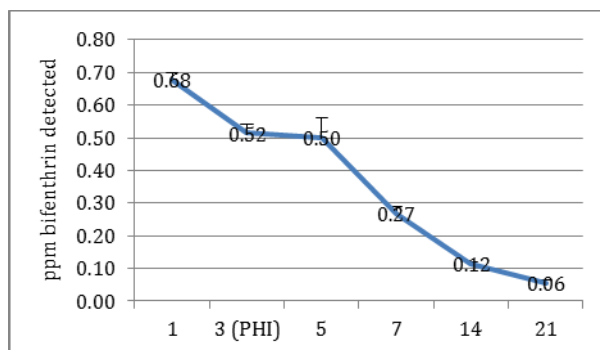


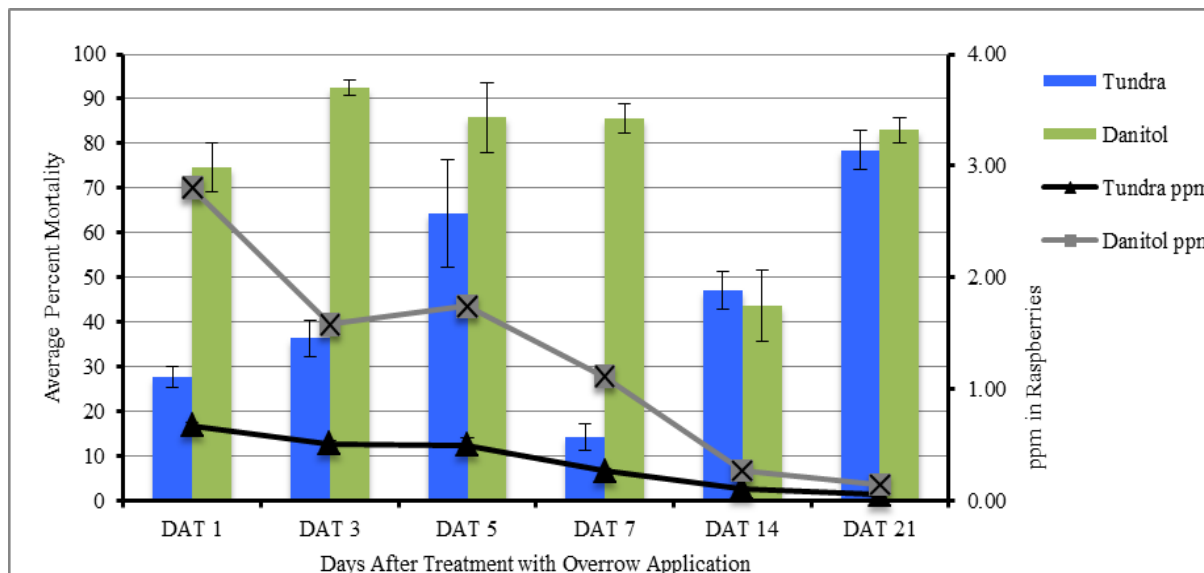
Figure 2. ppm bifenthrin detected over 3 weeks.



The figures above compare residual activity between the two pyrethroids. Pyrethroids typically exhibit a more gradual decline curve than organophosphates as seen above (Figs 1 & 2). At 3 DAT, when fruit can be harvested following a bifenthrin cleanup application, detectable residues have reached 0.52 ppm meeting the tolerance levels of the US (1), Japan (1), S. Korea (1), Taiwan (1) and Australia (3). Canada and China are not compatible and have no tolerance levels allowed (NT). Although ppm of fenpropathrin is higher than ppm of bifenthrin the MRLs are still compatible with most of the preferred Pacific Rim trading partners. At 3 DAT, when fruit can be harvested following a Danitol application, residue levels have reached 1.583 ppm approximately a 7-fold lower residue level than the MRL for the US (12) and Canada (12). AT 3

day PHI the residues are low enough to meet tolerances by China (5), Japan (5) and Taiwan (3) but levels remain detectable and it would be risky to export to countries like S. Korea (0.5) and Australia (NT).

Figure 3. Field residual and SWD % mortality.



Bioassays performed with field-aged residues (colored bars, Fig. 3) indicated Danitol was more persistent than Tundra[®] EC. Tundra was oversprayed with Malathion[®] at 7DAT and Both Tundra and Danitol were oversprayed with Mustang Maxx[®] at 14DAT, resulting in the increases in % mortality observed on those days.

Summary

Results of the MRL degradation curves for bifenthrin and fenprothrin indicate fenprothrin is more persistent and exhibits increased efficacy after 7 days compared with bifenthrin. As long as MRLs are favorable with target market trading partners, its efficacy appears greater than that of bifenthrin, indicating it could be a suitable substitute for the traditional cleanup spray at the beginning of the harvest season saving the second shot of bifenthrin for later use.

- *Restriction management Tundra[®] EC - Limited to 2 sprays/year, (0.2 lb a.i./acre/season) 3PHI.*
- *Danitol 2EC - Limited to 2 pt (0.6 lb. ai/acre/season) 3 PHI*