

Project Title: Innovative Management of Cutworms in Washington Vineyards

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Project Summary

In early-spring 2002 concentrated barrier delayed-dormant applications of the pyrethroid insecticide fenpropathrin applied to the soil/vine/trellis interface repelled cutworms. This prevented cutworms from subsequently climbing up into the vines and feeding on the swelling buds. Spring cutworm feeding is extremely damaging to grapevines and the treatment threshold is very low. In 2003 we propose to expand these trials into large plots to determine if the repellency effects of pyrethroids works at the macro level like they did in small plots.

Background:

Cutworms are inconspicuously marked, dull-colored caterpillars ranging from 0.6 to 2.0 inch (1.5 to 5 cm) in length. There are two species of cutworms verified as pests of grapes grown on the Columbia Plateau/ Yakima Valley. These are the spotted cutworm, *Amanthes c-nigrum* (L.) and the red backed cutworm, *Euxoa ochrogaster* (Guenee). Positive identification is important as behavioral differences affect control actions between these two pests. Fifth instar spotted cutworms are about 1.3 inch (3.5 cm) long and are a dull gray brown. Red backed cutworms are brownish or grayish with a yellow brown head. They can reach 1.5 inches long during their fifth instar of development. The back is usually reddish or reddish-brown bordered with dark bands. The spotted cutworm overwinters as 3rd instar larva whereas the red backed cutworm overwinters in the soil as an egg. Both species pupate after feeding ceases in spring and the subsequent 2nd (and occasionally 3rd generation) are associated with other weed or crop hosts.

Many varieties of grapes can tolerate a significant amount of damage without any economic loss. Feeding on grapevines occurs from bud swell to when shoots are several inches long. Injured buds may fail to develop. Yield reduction may occur primarily on varieties with non-fruitful secondary buds. Bud injury to grapes in April to early May is typically associated with spotted cutworm feeding. Feeding damage in late May and June can typically be attributed to red backed cutworm.

Chemical Management: The organophosphate insecticide Lorsban has been used for cutworm suppression in recent years. New insecticide products have recently been registered for use on grapes that have demonstrated good efficacy on cutworm populations on grapes in field trials conducted by Walsh in 2002 (see table below). These insecticides include the pyrethroids Danitol and Brigade, the fermentation product Success and several insect growth regulating insecticides including Confirm and Intrepid. Walsh initiated several studies in which Danitol was applied to the soil/ vine & trellis interface as a repellent barrier spray. Danitol barriers were applied in early-April, while sprays were applied several weeks later.

Mean ±SE number of damaged buds per 3 vine visual sample of grapevines on April 25, 2002

<u>Treatment</u>	<u>ai/ acre</u>	<u>application</u>	<u>Mean±SE</u>
Avaunt	0.11	foliar	0.25±0.25a
Danitol	0.2	foliar	0a
Danitol	0.4	foliar	0.75 ±0.47a
Danitol	0.2	barrier	0a
Intrepid	1.0	folier	2.75 ±1.80
Lorsban	2.0	folier	2.00 ± 0.58
Sevin	40# prod	bait	4.25 ±1.75
Success	0.156	folier	1.50 ±0.87b
Untreated			5.00 ±1.01

a/ population on treated vines is significantly lower ($p < 0.01$) than the non treated control in pairwise t-tests (b/ =0.05)

In 2002 at 3 locations the barrier treatment was the most effective at preventing subsequent feeding damage by cutworms (results above, and 2 other trials- data not shown) in small 15 vine plots. A primary objective of this project is to identify if this repellent barrier treatment is effective in large blocks.

Fortified carbaryl bait treatments have been used in California with a high degree of success in suppressing cutworm populations. In 2002 our results with carbaryl baits were disappointing. We would plan on testing several registered baits for their ability to suppress cutworm populations in Washington State vineyards.