

Chemical Control/New Products

Cherry Fruit Fly Control with GF-120 NF Bait

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Abstract: The GF-120 NF bait (a.i. spinosad) was tested under pest pressure conditions far in excess of what is normal in commercial orchards. As in 2003 research, it proved to be highly effective and did not damage the fruit or foliage. Bait applications proved to be an effective, practical option for organic and conventional growers and appear to be a viable “backyard” tree CFF treatment. One larva was found in a sample taken from a treated highly infested tree of excessive height. This situation was similar to the single larva “failure” in the 2003 trial, indicating that the bait will not provide 100% control the first year of treatment on trees with extreme infestation levels. Complete control was attained on all 10 retreated 2003 test trees and on 20 of 21 sites included in the 2004 rate trials. No larvae were found in any of the trees treated with reduced rates, despite the capture of adults on traps over the four weeks leading up to harvest. Further work is required to find the product rate and pest infestation level at which control is not reasonably dependable.

Materials and Methods

Materials. Spinosad 0.02% (GF-120 NF Bait), 40, 20, 15, 10 or 5 fl oz product/acre, 7-day application intervals. Respective ai/acre rates: 0.272 g, 0.136 g, 0.102 g, 0.068 g, and 0.034 g.

Application. The twenty-one bait plots were treated with a 1:3 bait to water mix applied with handheld “window washer” squirt bottles. The amount of bait applied to each tree was adjusted to closely approximate the desired rate per acre. For example, a standard sized orchard cherry tree fills a 20 x 20 foot space. This space is .0092 acre, or 109 trees per acre. Each rate per acre was divided by 109 and then adjusted to relate to each test tree size. A tree that covered a 10 x 10 space would be treated at 0.25 of the 20 x 20 tree space rate.

For the standard 20 x 20 foot sized tree, the rate of product applied was: 40 oz/acre = 0.37 fl oz, 20 oz/acre = 0.18 fl oz, 15 oz/acre = 0.138 fl oz, 10 fl oz/acre = 0.092 fl oz, 5 fl oz/acre = 0.046 fl oz.

The bait mixture was applied to each test tree every seven days starting the day the first adult was captured in the region. Some of the test trees were significantly taller than those in a commercial orchard, so bait sometimes was applied no higher than the lower 1/2 of the tree. When significant rainfall occurred during the bait application trials, the affected trees were retreated the following day.

Orchard application. The GF-120 NF bait was mixed at 1:4 ratio with water and applied in orchards with a 12 volt, electric pump, auxiliary sprayer strapped to the back of a “four-wheel” ATV motorcycle. Two adjustable-angle D3, D2 or D1 disc nozzles (with no core) directed streams of the bait/water mix across the upper half of the tree. Alternate rows were treated, but bait seemed to reach both sides of each tree. It was determined that the D3 nozzle was applying the bait mixture at a rate that required unsafe application speed (10-12 MPH). The D2 nozzle allowed application at about 6.0 to 6.5 miles per hour and sprayed a stream of bait mixture well into the upper 1/3 of large trees (5-7 meters). The D1 nozzle reduced the application distance to about 5-6 meters, but may be the better choice for smaller trees or for modest speed application (7.5 MPH at 20 foot row spacing) to each row middle. The side of the trees treated was alternated weekly, and the outside row of each orchard was treated every week. Growers being introduced to this application method were highly satisfied with the process.

Test sites. Twenty-three separate sites with one to three cherry trees each were treated during this trial. Unfortunately, many other trees were offered as treatment sites by the owners and proved not to be infested with cherry fruit fly. It seems that “free” treatments are difficult to resist, even when unnecessary. As a result, there were less than four infested replicates in all but the 20 oz/acre rate. Successful replicates within the rate treatments were: 40 oz/acre = 2 sites, 20 oz/acre = 6 sites, 15 oz/acre = 1 site, 10 oz/acre = 3 sites, and 5 oz/acre = 2 sites. See Table 1 for details.

One commercial organic cherry orchard with a history of CFF infestation and two conventional small-acreage cherry orchards were included for demonstrations of GF-120 NF bait application methods and calibration.

Results and Discussion

The untreated check trees had high numbers of adults caught on traps and significant fruit infestation. An ineffective product (a.i. azadirachtin) was included in the trial and was applied on six separate randomly selected infested sites. The subsequent high adult trap catch and significant larval infestation in these treatments illustrate the potential for significant control failure if the product being tested is not effective (see Table 1). Potential for treatment failure in the GF-120 NF treatment sites varied from moderate to very high. It appears that GF-120 NF bait treatments greatly suppress adult trap catch numbers on moderately infested trees.

Within the 21 moderately to highly infested “backyard” sites treated weekly with the bait, only one larva was found in a single 950 fruit sample taken from one site. This site consisted of three highly infested 35 to 40 foot tall, unpruned sweet cherry trees where 204 adults were captured on one trap. On the other bait treatment sites where numerous adults were caught per trap in 2003 and 2004, no larvae were found in 3,650 fruit.

Table 1. Data summary

Product	Ai/acre	Product rate/acre	Spray interval	# of sites/trees	# Fruit	Larvae found	Adults/trap in 2004
Untreated checks	0	0	NA	5/5	2450	423	86
Azadirachtin	8.2-12.4 g	24 & 36 fl oz	7	12/22	2000	102	163
Provado Standard	45.4 g	8 fl oz	10	5/10	1000	0	79
GF-120NF	0.034 g	5 fl oz	7	2/2	750	0	16
GF-120NF	0.068 g	10 fl oz	7	4/4	650	0	5
GF-120NF	0.102 g	15 fl oz	7	2/2	500	0	8
GF-120NF	0.136 g	20 fl oz	7	11/15	1500	0	14
GF-120NF	0.272 g	40 fl oz	7	1/1	250	0	15
GF-120NF	0.276 g	40 fl oz	7	1/3	950	1	204