Biology/Phenology

Management of Native Vegetation for Control of Stink Bug

Christian Krupke and Jay Brunner
Washington State University Tree Fruit Research and Extension Center, Wenatchee, WA

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Stink bugs are an emerging pest in many agricultural commodities worldwide, including apples and pears in Washington and Oregon. The primary stink bug (SB) species responsible for damage in northcentral Washington orchards is the consperse stink bug, *Euschistus conspersus.* This insect spends the majority of its life cycle in native vegetation outside orchards, immigrating into orchards only in late summer/early fall. Research was undertaken to determine whether targeting native vegetation prior to this immigration would be a viable management tool for reducing fruit injury at harvest.

Methods and Materials

Three border management strategies were evaluated in 1999:

1. Border clearing: Border vegetation containing common stink bug host plants such as mullein and bitterbrush was mechanically cleared to bare rock in a 100 ft long X 50 ft wide area immediately adjacent to orchards with histories of high SB damage. This clearing was conducted in mid-June, well before the typical onset of immigration into orchards in late July. Fruit injury in the blocks was assessed immediately before harvest to assess efficacy of this strategy in reducing SB immigration and associated damage.

2. Border baiting: Beginning in mid-June, and continuing through September, SB host plants adjacent to orchards were baited with a lure containing the primary component of *E. conspersus* aggregation pheromone. Lures were placed at 20 ft intervals in a 200 ft plot, with baited sections alternating with unbaited controls of similar habitat. Fruit injury was assessed in each of the blocks immediately before harvest to evaluate the hypothesis that SB could be retained on native hosts (thus delaying/reducing immigration to orchards) by the presence of aggregation pheromone.

3. Border spraying: Throughout June, July and August many growers applied broadcast applications of chemical insecticides to orchard borders to attempt to reduce SB populations prior to immigration. Experiments were conducted to attempt to evaluate a) the most effective insecticides and b) the most effective method of delivery of insecticides to the target insect. Using mullein plants baited with aggregation pheromone, large numbers of SB were concentrated in border areas to be sprayed. Three insecticides were evaluated: phosphamidon (Swat®), acephate (Orthene®), formetanate (Carzol®). Each insecticide was applied with airblast sprayer (broadcast over entire border) at 400 gpa and with handgun sprayer (spray targeting only pheromone-baited host plants) at 200 gpa. Numbers of bugs were counted immediately before spray application, and at intervals of 1, 24, 48 and 72 h post-spray.

Results and Discussion

1. Border clearing: Border clearing did not result in significant decreases in SB damage at harvest, suggesting that SB adults are able to immigrate into orchards (likely by flying) from distances of greater than 50 ft.

2. Border baiting: Border baiting did not result in significant decreases in stink bug damage at harvest, suggesting that the presence of pheromone alone is insufficient to prevent SB immigration into orchards. However, this technique will be evaluated further in 2000 in combination with targeted insecticide applications (see below), to attempt to reduce SB populations before immigration occurs.

3. Border spraying: The three insecticides tested all showed limited effectiveness in reducing SB numbers on pheromone-baited plants when applied with an airblast sprayer (Figure 1). However, in all cases, insecticides performed better when applied using a handgun sprayer (Figure 2), suggesting that this method is more effective in delivering spray to the underside of the leaf and the leaf axils, where SB are usually most numerous. Research in 2000 will continue to evaluate the efficacy of this 'attract-and-kill' strategy, as well as assessing rates of pheromone-mediated parasitism on baited plants, relative to unbaited controls.

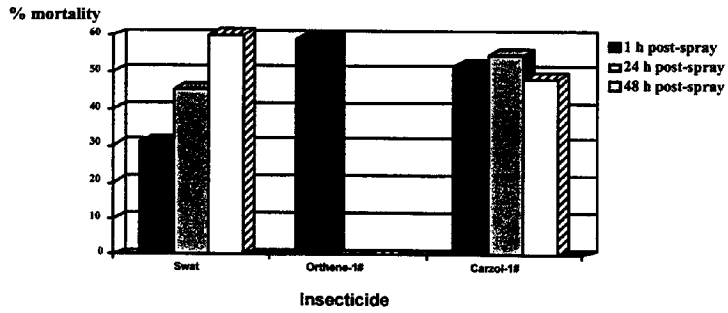

Figure 1. Numbers of stink bugs on pheromone-baited plants at intervals following insecticide application with air-blast sprayer.

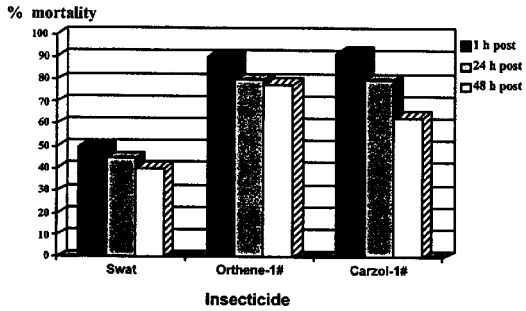

Figure 2. Numbers of stink bugs on pheromone-baited plants at intervals following insecticide application with hand-gun sprayer.