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Fruit & Pecan Pests

Dr. Donn T. Johnson - Fruit Research/Extension

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- **Strawberry sap beetle** (*Stelidota geminata*)

Biology: Adults are less than 1/8 inch long and 1/10 inch wide, oval-shaped, and mottled brown in color with two light spots visible on each wing. At about the time berries begin to ripen, adults fly into strawberry and blackberry plantings from wooded areas where they overwintered. They are particularly attracted to over-ripe berries.

Figure 1. Strawberry sap beetle collected from ripe or overripe blackberries (Photo: D. Johnson)

Damage: These beetles are showing up in fields of blackberries and contaminating clam shells of berries. Their feeding leaves deep cavities in berries that cause berry decomposition. Females deposit eggs on these damaged berries. Usually larvae are unnoticed because they feed in overripe, decomposing berries that are probably culled out. Damage is often greatest in U-Pick operations where pickers leave large numbers of ripe and over-ripe berries in the field.

Control: The absence of sap beetles from early season samples in berries confirms that most, if not all, beetles move into berry fields as fruit ripens. Loughner et al. (2008) reported adult beetles were first caught in strawberries approximate to 19 d after occurring in baited traps placed along edges of adjacent wooded areas. The beetles arrived during the same sampling interval in traps at all distances into the fields, indicating that a border spray is unlikely to adequately control strawberry sap beetle. This has important management implications:

1. It makes no sense to apply insecticides for controlling this beetle before fruit ripening.
2. Growers can exploit its dispersal behavior by intercepting the beetles before they enter the field using traps baited with an attractive lure.

Sanitation: Strawberry sap beetles are best controlled by timely and complete ("clean") picking, keep berries off the ground and the removal of over-ripe and damaged berries.

Trapping: Research has shown that sap beetles are strongly attracted to certain volatile plant compounds in ripening or decaying fruits, and these beetles produce odors that elicit an aggregating behavior. The presence of peripheral traps baited with fermenting bread slightly increased captures of adults within the strawberry planting, suggesting that mass trapping of adults with only fermenting bread baited traps may not be a viable management strategy (Rhainds and Loeb 2002) but traps baited with more attractive fermenting fruit may be. The current recommendation is to establish bait buckets containing overripe fruit between the berry planting and nearby wooded areas. Empty beetles from bait buckets on a daily basis.

Trap - fill a small screened 4 oz specimen cup with over-ripe berries (your culls). Place cup of berries inside a 1 quart deli cup trap that has lid with 1/5 inch (5 mm) holes. Then add a beetle drowning

mixture of 9 parts apple cider vinegar and 1 part ethanol. These traps may prove useful for intercepting dispersing beetles from woods to the berry planting and reduce beetle numbers in the berries.

Control: Two insecticides (Assail and Danitol) have different modes of action that will control sap beetles.

- Assail (acetamiprid; 1 day PHI; restricted to no more than 5 applications per season) is registered for sap beetle control. Assail only gives fair control of spotted wing drosophila.
- Danitol (fenpropathrin; has 3 day PHI on blackberry and raspberry and 2 days for strawberry; restricted to no more than 2 applications per season) applied at dusk or mid-day, between the appearance of ripe fruits and the first harvest, reduced infestation of fruits by sap beetle larvae (Rhainds and Loeb 2002). Danitol gives good to excellent control of spotted wing drosophila.

- **Spotted wing drosophila (SWD)**

  This fly is a new invasive pest that lays eggs in and larvae feed inside ripening, soft-skinned fruits in Arkansas. The adult female and male flies are 3 mm long (1/16 to 1/10 inch), have big red eyes but only the male has a black spot on the tip of each wing whereas the female has no wing spot. The elongated white egg (< 1 mm long) is inserted under the fruit skin with two long threads resting outside for breathing (called spiracles). The white larva is legless (< 1/8 inch) with two small breathing tubes on one end (spiracles) and two black mouthparts on the other (Fig. 2).

  Hosts: This year in Arkansas, SWD has been damaging ripe fruit of wild and commercial blackberries, raspberries, 'Wye' berries and has now been found in nectarine (Fig. 2). Peach samples collected on 24 July at the University of Arkansas Fruit Station in Clarksville had SWD eggs and larvae in circular lesions (Fig. 2). So far, we have not confirmed any SWD infestation in samples of blueberry or grape or strawberry.

Figure 2. Circular, sunken lesions on nectarine (left) infested with many spotted wing drosophila eggs and several larvae (25 July; Photo: D. Johnson)

Control: We recommend weekly insecticide treatments when there are susceptible ripening or ripe fruit present in plantings of blackberries, 'Wye' berries, raspberries and nectarines if you see damage noted in Fig. 2. Other soft skinned fruits may be susceptible so have your county agent send suspect samples to Dr. Donn Johnson at: AGRI 319, Department of Entomology; University of Arkansas; Fayetteville, AR 72701
Cell: 479-409-4628 or email: *dtjohnso@uark.edu)*

Much of the information obtained for this newsletter was gathered by the authors at the University of Arkansas-Fayetteville. All chemical information is given with the understanding that no endorsement of named products is intended nor is criticism implied of similar products that are not mentioned. Before purchasing or using any pesticide, always read and carefully follow the directions on the container label. Compiled by: Donn T. Johnson, University of Arkansas, Department of Entomology, E-mail: dtjohnso@uark.edu