



## Arkansas Fruit and Nut News Volume 2, Issue 8, 14 Nov. 2012

### **Spotted Wing Drosophila:**

The spotted wing drosophila (SWD) is native to eastern Asia and Japan. It became an invasive species in California in 2008 when it was first found damaging soft-skinned fruits: blackberry, raspberry, blueberry, cherry and strawberry. Later, it dispersed to other states along the west and east coasts of North America where it has also caused economic damage to fruits. This pest appeared in several Midwest states in 2010 and 2011 and in Arkansas in 2012. In October 2012, ripe bramble fruit collected from high tunnels in Fayetteville, AR were infested with a few drosophila larvae that developed into SWD flies. Other states have reported that this fly begins to lay eggs in May and the number of flies peak in September and October resulting in more fruit damage. This fly could become a significant fruit pest for Arkansas growers harvesting susceptible fruit in the fall or in high tunnels that extend fall harvest to early-winter. See the Arkansas fact sheet ([click](#)) to learn about: SWD biology; see pictures of the SWD fly, larvae, fruit damage; constructing and using an apple cider vinegar baited monitoring trap; and how to check fruit for larvae.

SWD fact sheet: [http://www.uaex.edu/Other\\_Areas/publications/PDF/FSA-7079.pdf](http://www.uaex.edu/Other_Areas/publications/PDF/FSA-7079.pdf)

**Scouting:** A couple weeks before fruit ripens, hang out apple cider vinegar baited traps near a fruit planting in the shade. Check traps twice weekly to confirm when SWD flies appear in your area. As fruit ripen, begin checking ripe fruit for larvae (see fact sheet: [click](#)).

**Sanitation:** Harvest fruit frequently and completely since these flies mainly attack ripening fruit.

**Control:** Begin sprays when flies are captured in traps to minimize flies laying eggs. Insecticide sprays will not control larvae already in the fruit. Re-apply insecticide at 5 to 7 day intervals and repeat after a rain event. There are a number of effective compounds listed in the fact sheet ([click](#)). Always read product labels to make sure pesticides are registered for use on the fruit or berry you are treating.

### **Mites and Aphids on Fall Planted Strawberry:**

Aphids (Fig. 1) suck chlorophyll from strawberry leaves and secrete the excess liquid as sugary honeydew. This honeydew promotes a sooty mold that will contaminate leaves and fruit making fruit unmarketable.

Spider mites (Fig. 2) can suck enough chlorophyll from strawberry leaves causing white stippling and bronzing of leaves, significant reduction in yield and even kill plants. Be aware that strawberry cultivars vary in susceptibility to spider mites.

**Scouting:** Now is the time to be scouting your fall planted strawberries for insects and mites, especially if you have them in a high tunnel or under a row cover. It is recommended that growers randomly inspect and record the numbers of mites per strawberry leaf by inspecting one leaf on each of 20 plants equally spaced from one end of the row to the other. Equation: average number per leaf = (total number of mites or aphids) / 20 leaves.

The potential for fruit contamination by sooty mold occurs when you detect more than 30% of plants with the oldest trifoliolate leaf infested with aphids. Trumble et al. (1983) developed a sequential sampling technique for aphids. It involves checking the oldest trifoliolate strawberry leaf on each of 5 or more plants and recording if aphids are either present or absent. After every 5 plants, re-calculate the percentage of plants with aphids present. You can stop sampling subsequent groups of 5 plants when you either detect: greater than 30% of the oldest trifoliolate leaves with aphids (need to spray); or less than 20% of the oldest trifoliolate leaves with aphids (do not spray but re-sample plants in a week).

At the SW Research and Extension Center in Hope, AR, the leaves had 1.2 aphids (Fig. 1 a) and 0.05 parasitized aphid mummies (Fig. 1 b) but 0 spider mites per strawberry leaf. In Eureka Springs, AR, strawberry leaves averaged a few green aphids (Fig. 1 c-d) and some plants had several twospotted spider mites (Fig. 2 a-c) and red carmine mites (Fig. 2 d-e). At the Arkansas Agricultural Research and Extension Center in Fayetteville, AR, strawberry leaves had 0.7 black aphids (Fig. 1 d) and 0.6 spider mites per strawberry leaf. A magnifying headband (Fig. 1f) is a great aid for inspecting strawberry leaves for insects and mites.

#### **Mite and Aphid Control:**

The threshold that justifies applying an acaricide is currently 5 spider mites per leaf (English-Loeb 2003).

The threshold that justifies applying an insecticide is when more than 30% of the oldest trifoliolate strawberry leaves have aphids present (Trumble et al. 1983).

It is essential to achieve good coverage with an acaricide or horticultural oil (1% by volume) for mites and aphids, especially on the underside of strawberry leaves, to adequately reduce spider mites and aphids below damaging levels. Good coverage can be achieved with a leaf blower-like back pack sprayer. Use of a horticultural oil spray requires a second application 5 days later to kill any newly hatched mites. The current cool fall temperatures should minimize any leaf burn by the oil.

Releasing predator mites take slightly longer to reduce the spider mite numbers below threshold than does an acaricide. Releasing tear-drop shaped predator mites (Fig. 2 f) such as *Neoseiulus californicus* can reduce spider mites numbers below damaging threshold levels in one week. This release eventually adjusts the ratio of spider mites to predator mites to less than 5 to 1 which indicates biological control is occurring (Greco et al. 2005). Therefore, a threshold of 2 spider mites per leaf is used if you plan to release purchased predatory mites on strawberries (Sources: Arbico Organics; Rincon-Vitova Insectaries, Bionet.com). Release at a rate of 1 or 2 predator mites per square foot of plant row (assume 2 foot wide row). Two weeks after release, inspect and record counts of spider mites and predator mites per leaf. Release more predator mites (same rate) only if the ratio of spider mites to predator mites remains above 5 to 1.



Figure 1. Scouting fall planted strawberries in three high tunnels in Arkansas in early November detected three aphid pest species: a) green aphids with green cornicles on sides of abdomen and b) an aphid parasitized by a larva of a tiny wasp causing aphid to die and turn into a tan mummy (Hope, AR); c-d) green aphids with black cornicles on sides of abdomen (Eureka springs, AR); e) black aphids (Fayetteville, AR) (Photos: D. Johnson); and f) is a 2.5x to 3.5x power magnifying headband (Donegan Optivisor).



Figure 2. Mites on underside of strawberry leaves: a-b) twospotted spider mite adult and eggs next to a leaf vein, c) twospotted spider mite adult, two nymphs, a round, white egg and silk threads; and d-e) red carmine spider mite and f) predatory mite (Photos: D. Johnson).

**References Cited:**

- English-Loeb, G. 2003. Economic threshold for two-spotted spider mites (*Tetranychus urticae*) on strawberries grown as a perennial. Report to the North American Strawberry Growers Association.
- Greco, N. M., N. E. Sanchez, and G. G. Liljestrom. 2005. *Neoseiulus californicus* (Acari: Phytoseiidae) as a potential control agent of *Tetranychus urticae* (Acari: Tetranychidae): effect of pest/predator ratio on pest abundance on strawberry. *Exp. Appl. Acarol.* 37: 57-66.
- Trumble, J., E. Oatman, and V. Koth. 1983. Thresholds and sampling for aphids in strawberries. *California Ag.* November-December 1983.

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