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ENY-839

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Thrips Monitoring in Florida Blueberries[1]

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Introduction

Several species of flower thrips including the Florida flower thrips, *Frankliniella bispinosa* (Morgan), western flower thrips, *F. occidentalis* (Pergande), eastern flower thrips *F. tritici* (Fitch)}, and *Scirtothrips ruthveni* Shull are pests of cultivated blueberries. Flower thrips belonging to the genus *Franklinella* affect both Rabbiteye and southern highbush blueberries (Liburd and Arevalo 2005). *Frankliniella bispinosa* is the key pest and the most abundant species found in blueberries in Florida (Arevalo et al. 2006).

Flower thrips are very small insects (~1 mm in length) with yellowish to orange coloration (Figure 1). They can be distinguished from other insect orders by their fringed wings. They have a short life cycle that can occur in 18 to 22 days under ideal conditions (Lewis 1997). Thrips progress though two actively feeding larval instars and two inactive instars (often called pupae) before becoming adults.

Flower thrips damage blueberry flowers in two ways. Larvae and adults feed on all parts of the flowers including ovaries, styles, petals, and developing fruit. This feeding damage can reduce the quality and quantity of fruit produced (Figure 2a).

Females also cause damage to the fruit when they lay their eggs inside flower tissues. The newly hatched larvae bore holes in the flower tissue when they emerge (Figure 2b).

Figure 1. A flower thrips (*Frankliniella sp.*).

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In areas where southern highbush blueberries are grown, several varieties are planted on the same farm. These varieties differ in fruit and flower characteristics and in the timing and length of flowering period (Williamson and Lyrene 2004). This may result in differences in thrips numbers and injury in blueberry plantings.

Figure 2. Thrips damage (circled) on blueberry fruit caused by a) feeding and b) larval emergence.

Techniques for Monitoring Flower Thrips Populations

The are several techniques for monitoring thrips in blueberries.

Sticky traps. White, blue and yellow sticky traps can be used for monitoring thrips. White traps are preferred over blue and yellow because it is difficult to see thrips against the blue background and yellow traps attract a large percentage of beneficial insects. Finn (2003) found that more *F. bispinosa* were caught on white and blue sticky traps compared with yellow and green traps in southern highbush and Rabbiteye blueberries.

Sticky traps can be hung inside the canopy of blueberry bushes using twist ties (Figure 3). They should be placed 1 - 2 ft below the top of the bush. At least four traps per acre should be sufficient to monitor thrips population (two traps on rows inside the field borders and two in the interior area of the field). Traps should be checked and changed out weekly. The thrips found on the trap should be counted with the aid of a hand lens.

Flower sampling. Sampling or collecting approximately 20 flowers per acre will give an accurate estimate of thrips numbers inside of a blueberry planting. Flowers can be sampled for thrips in several ways. The simplest method involves gently

Figure 3. A white sticky trap hung on a blueberry bush.

tapping the flowers and allowing the thrips to fall onto a white sheet below for counting. This is best used for a presence/absence evaluation. Flowers can also be collected in a plastic bag for dissection. These bags of flowers should be processed within 3 days to maintain the integrity of the sample. Flowers should be stored in a freezer if the sample will be stored for longer than 3 days before dissection. Dissection gives an accurate estimate of thrips per flower; however, it is usually more labor intensive and time consuming than flower tapping. Arévalo and Liburd (2007) developed a “shake and rinse” method that is as accurate as dissecting flowers and much more efficient. This method involves collecting the flowers in alcohol (70% ethanol) filled vials, shaking the vials, placing the flowers on a metal screen over a plastic cup, rinsing the flowers with water, and counting and collecting the thrips in the rinse water. When analyzing flowers collected in vials with alcohol, the contents should be shaken vigorously for 1-2 minutes before pouring onto a plate with a white background for counting.

We have determined a strong correlation between the number of thrips captured in sticky traps and the number of thrips found in Rabbiteye blueberry flowers (Arévalo 2006). Tifblue and Climax are two very popular Rabbiteye blueberry varieties. The Economic Injury Level (EIL), i.e., the lowest number of thrips that can cause economic damage was approximately 68 thrips per trap for Tifblue and 75 for Climax at the beginning of the pollination period (for the 2007 blueberry production season). These numbers can be used for future

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guidelines to implement management programs. We recommend that growers use Spinosad (SpinTor 2 SC) at the 6 oz per acre rate to manage flower thrips populations in southern blueberries (Rabbiteye and southern highbush).

Another new reduced-risk insecticide that has just received registration for thrips and Lepidoptera control in blueberries is Delegate™ WG. This insecticide uses a new molecule from the Spinosyn group to give longer residual activity for thrips control. It is more photo-stable (less likely to be degraded by sunlight) in the environment. It should be applied at 3-6 oz per acre. The post harvest interval (PHI) is 3 days and the re-entry interval (REI) is 4 hours. Delegate™ has minimal activity on bees after the spray is allowed to dry. Therefore, it should be applied early in the morning or late in the evening so it will dry before the bees become active. For more information on thrips control in blueberries contact your extension agents in your county or log onto fruitnvegipm.ifas.ufl.edu.

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