Photo credit: James Castner

Figure 1. Whitefly adults and eggs

Early outbreaks of sweetpotato whiteflies

By Xavier Martini, Mathews Paret and Josh Freeman

Outbreaks of sweetpotato whiteflies [also called silverleaf whitefly, *Bemisia tabaci* (see Figure 1)] were recorded in late August 2016 in the Florida Panhandle and south Georgia on tomatoes and other vegetables. Whitefly is a generalist herbivore insect that feeds on 600 host plants. Sweetpotato whitefly damages plants directly by feeding and causes silverleaf disorder in cucurbits (see Figure 2, page 27) and irregular ripening in tomato. It also vectors over 111 different plant viruses such as squash vein yellowing virus that can kill watermelon plants and results in necrotic areas on the fruit, cucurbit leaf crumple virus that is mainly destructive for squash but affects other cucurbits, and tomato yellow leaf curl virus that affects tomatoes.

B VS. Q BIOTYPES

The arrival of whitefly in August is quite unusual in this area. Whitefly densities usually increase in October when cotton is defoliated and soybean senesces. This early arrival of whiteflies requires attention, given the recent outbreak of Q biotype whiteflies in the Florida landscape. Sweetpotato whitefly is a complex of 28 cryptic species. In the United States, the most common are the B and Q biotypes. Q biotype is a particular source of concern as it is more resistant to insecticides than B biotype and is replacing B biotype in other parts of the world. Since July 2016, Q biotype has been found in eight counties in Florida, but not in the Panhandle so far.

Biotypes Q and B are indistinguishable visually and need to be discriminated by genetic analysis. The whiteflies collected so far by the University of Florida North Florida Research and Extension Center (NFREC) in Gadsden County were all B biotypes, but it is important to pursue the monitoring of our whitefly population to be sure that the Q biotype does not settle in this area.

To sample for biotyping, sample one whitefly per plant, and collect between 10 and 50 whiteflies. Keep whiteflies collected on different host plants separate. Adults can be collected by hand, or nymphs and pupae (see Figure 3, page 27) can be detached from leaves with a small knife. Store specimens in 95 percent ethanol or freeze them and bring them directly to the NFREC or to your local Cooperative Extension agent, who will send them for biotyping. Alternatively, infested foliage can be brought in as well.

MANAGEMENT STRATEGIES

Simple cultural practices can help reduce whitefly damage. Sanitation is

Figure 2. Silverleaf disorder on squash

Photo credit: Lyle Buss

Figure 3. Whitefly nymphs and pupae

one of them. After harvest, crop residue such as tomato plants should be removed to reduce virus reservoirs. Natural enemies are an important part of whitefly control. It has been found that whitefly outbreaks occurred more often when natural enemy populations are absent because of repeated insecticidal sprays. Natural enemies of sweetpotato whitefly include parasitoids, lacewing, minute pirate bug and some minute species of ladybird beetles. It is always important to assess the presence of natural enemies before applying an insecticidal treatment.

If whiteflies are present in high density and natural enemies are not found, insecticide application is advised. Based on experience, these populations will likely need to be managed until early November in most vegetables. It must be noted that sweetpotato whitefly is particularly challenging to control with insecticides because it lives on the underside of the leaf and easily develops resistance against insecticides.

To optimize insecticidal efficiency against sweetpotato whitefly, it is preferable to use systemic insecticides such as neonicotinoids (imidacloprid, thiamethoxam and dinotefuran) and diamides (Cyazypyr). Additionally, pymetrozine (Fulfill) has been found to reduce virus transmission in tomatoes. Foliar application of neonicotinoid should be restricted to the period before flowering because of toxicity to bees. For organic crops, neem oil or insecticidal soap are potential alternatives to synthetic insecticides. Because whitefly is prone to development of resistance, it is crucial to rotate insecticide modes of action (which can be found in the Vegetable Production Handbook of Florida and on pesticide labels).

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Visit these websites for additional information:

- Sweetpotato Whitefly B Biotype, http://edis.ifas.ufl.edu/in286
- Recommendations for Management of Whiteflies, Whitefly-Transmitted Viruses, and Insecticide Resistance for Production of Cucurbit Crops in Florida, http://edis.ifas.ufl.edu/in871
- Management of Tomato Yellow Leaf Curl Virus in Tomato in North Florida, http://edis.ifas.ufl.edu/pdffiles/nf/nfrec100.pdf
- Vegetable Production Handbook of Florida 2016–2017, http://edis.ifas.ufl.edu/pdffiles/cv/cv29200.pdf