

Vegetarian Newsletter



Horticultural Sciences Department

A Vegetable Crops Extension Publication

June 2007

Use of Lacewing Adults for Silverleaf Whitefly Control in Central Florida

By Phyllis Gilreath, Manatee County Extension Service; Dave Schuster, GCREC – Balm; Alicia Whidden, Hillsborough County Extension Service

There has been considerable interest in recent seasons in the use of lacewings as a biological control method for silverleaf whitefly (SWF). Anecdotal evidence has been inconsistent, thus a trial was initiated with funds from an IPM Florida grant in the fall of 2006. Four commercial tomato farms in Manatee and Hillsborough Counties were chosen as the study area, with a control block and a lacewing release block on each farm. Blocks were located as far from each other as possible but were planted at approximately the same time with the same variety. Blocks averaged 10 to 25 acres each and were selected partly due to the density and variety of weed populations surrounding them. Lacewing adults, provided by Biofac, Inc., were released weekly around each release block from July 6, 2006 though November, 2006. Because of frequency of pesticide applications and the reluctance of tomato growers to reduce or eliminate insecticide sprays, releases were made around the field perimeters, with an effort to direct the lacewings into the weedy

areas along the field edges. Yellow sticky traps (3 inch squares, double-sided) were placed at 6 sites around both release and control blocks one month prior to planting and an additional trap was also placed in the middle of each of 6, 100-plant plots within the block after planting. Traps were examined for whitefly adults and replaced weekly. Plants with obvious symptoms of virus were counted twice weekly from each of the 100-plant plots within the blocks. The numbers of whitefly adults per plant were determined in the vicinity of each trap in the block interiors of three farms during twice weekly commercial scouting. Data were also collected on weed species within about a meter of each sticky trap around field perimeters to estimate the relative abundance of SWF weed hosts at each site. Whitefly adult data and virus incidence data were subjected to two-way analyses of variance with farms as replicates and blocks within farms as experimental units (release and control treatments).

The data were variable over time and no consistent trends were discernible. In general, there were no significant differences among trap catches, plants with virus symptoms, or whitefly counts on the plants. Data were analyzed using averages from all four sites. Season total SWF counts on plants were 164 for the control blocks and 186 for the release blocks (lsd=51). TYLCV incidence was very similar for both control and treated blocks. (Data not presented) Weeds present around field perimeters were varied and are presented in Table 1. Weeds are listed from highest to lowest density at each perimeter trap by block and farm site. In previous work by Dr. Dave Schuster, weed leaves with SWF immatures present were collected and the % of emergence was counted. Using the results of this work (including those with 50% or greater emergence) and other literature that documents weed hosts of SWF, entries in Table 1 which are known SWF hosts were highlighted to get an overall picture of the distribution of weed hosts at these sites. While all sites had some weed hosts present, there did not appear to be that much difference in numbers. While this study did not produce significant results in the criteria of interest, it may help substantiate the feeling by some that this type of biological control approach may be more effective on a larger scale, i.e. over several farms in an area or regionally. Additional work is needed, but the cost may be prohibitive. There is also a lack of data on weed hosts of TYLCV. This is an area of research that would be beneficial to the overall management picture.

Table 1. Weed Observations on Field Perimeters - IPM Florida Lacewing Trial, Fall 2006

| Weeds Present | | | | | | | | |
|----------------------|--------|----------------------------|-----------------------------------|---------------------------|--------------|---------------------------|-----------------|--------------|
| Farm | Trap # | Highest Density | → → → → → → → → → → → → → → → → → | | | | Lowest Density | |
| 1-C* | 1 | Fox Grape | Blackberry | Peppervine | Lantana | Bordered by Guineagrass | | |
| | 2 | Canopy of Brazilian Pepper | Ragweed | Hairy Indigo | Dayflower | Florida pusley | Spanish Needles | Guinea-grass |
| | 3 | Canopy of Brazilian Pepper | A little day flower | Hairy Indigo | | | | |
| | 4 | Canopy of Brazilian Pepper | Ceasarweed | Spanish Needles | Hairy Indigo | Dry Maria Cordata | | |
| | 5 | Smilax auriculata | Florida pusley | Hairy Indigo | | | | |
| | 6 | Brazilian Pepper | Flattopped Golden Rod | Galactia elliottii | | | | |
| 1-R* | 1 | Canopy of Brazilian Pepper | Small Cabbage Palm | Grape in Brazilian Pepper | | | | |
| | 2 | Canopy of Brazilian Pepper | Spanish Needles | Bahiagrass | Grape | | | |
| | 3 | Canopy of Brazilian Pepper | Peppervine | Grape | | | | |
| | 4 | Spanish Needles | Blackberry | Ceasarweed | Grape | Balsam Apple | | |
| | 5 | Ceasarweed | Blackberry | Balsam Apple | Dodder | Dayflower | | |
| | 6 | Canopy of Brazilian Pepper | Teaweed | Grape | Hairy Indigo | Spanish Needles | | |
| 2-C | 1 | Cogongrass | Ceasarweed | Aeschynomene | Wax Myrtle | Melothria (wild cucumber) | | |
| | 2 | Coastalplain Willow | Primose Willow | Paspalum Grass | | | | |

Table 1. Weed Observations on Field Perimeters - IPM Florida Lacewing Trial, Fall 2006

| | | Weeds Present | | | | | | |
|------|--------|--------------------|-----------------------------------|-----------------|--------------------------|----------------|-----------------------------|----------------|
| Farm | Trap # | Highest Density | → → → → → → → → → → → → → → → → → | | | | | Lowest Density |
| | 3 | Dogfennel | Brazilian Pepper | Spanish Needles | Ceasarweed | Ludwigia | | |
| | 4 | Cogongrass | Wax Myrtle | Guineagrass | | | | |
| | 5 | Cogongrass | Dogfennel | Spanish Needles | Hairy Indigo | Bermudagrass | Ragweed | Lindernia |
| | 6 | Yellow nutsedge | Oenothera lacinata | Eclipta Alba | Goosegrass (Eleusine) | Clover | Lepidium | |
| 2-R | 1 | 100% Cogongrass | | | | | | Galium (?) |
| | 2 | Wax Myrtle | Cogongrass | Caesarweed | Tasselflower | Florida pusley | Saltbush Balsam Apple | |
| | 3 | Ceasarweed | Wax Myrtle | Florida pusley | Cogongrass | Ragweed | | |
| | 4 | Ragweed | Bermudagrass | Spanish Needles | Ceasarweed | Lepidium | | |
| | 5 | Ragweed | Bermudagrass | Hairy Indigo | Teaweed | | | |
| | 6 | Ragweed | Bermudagrass | | | | | |
| 3-C | 1 | Cogongrass | Florida Pellitory | Primrose Willow | Sonchus | | | |
| | 2 | Lantana | Teaweed | Diodia | Dayflower | Spurge | Peppervine | Ludwigia |
| | 3 | Bermudagrass | Crotolaria | Florida pusley | Vigna | Luteolea | Guineagrass | |
| | 4 | Teaweed | Paspalum | Spanish Needles | Hairy Spurge | | | |
| | 5 | Paspalum (100%) | Vigna | Luteolea | Brazilian Pepper | | | |
| | 6 | Vasey Bean | Paspalum(100%) | | | | | |
| 3-R | 1 | Primrose Willow | Coastalplain Willow | Blackberry | Crowfoot- grass | Peppervine | | |
| | 2 | Primrose Willow | Spanish Needles | Aeschynomene | | | | |
| | 3 | Elderberry | Spanish Needles | Spurge | Primrose Willow | | | |

Table 1. Weed Observations on Field Perimeters - IPM Florida Lacewing Trial, Fall 2006

| | | Weeds Present | | | | | | | | | | | | |
|------|--------|-----------------------|--------------------|---------------------------------|----------------|--------------|--------------|------------|--------------|--|--|--|--|----------------|
| Farm | Trap # | Highest Density | | → → → → → → → → → → → → → → → → | | | | | | | | | | Lowest Density |
| | 4 | Teaweed | Lantana | Spanish Needles | | | | | | | | | | |
| | 5 | Spanish Needles | Ragweed | Poorman's Pepper | | | | | | | | | | |
| | 6 | Guineagrass | Spanish Needles | Radish | Ludwigia | Ragweed | | | | | | | | |
| 4-C | 1 | Ipomoea triloba | Two Spotted Spurge | | | | | | | | | | | |
| | 2 | Canopy of Chickweed | Bermudagrass | Guineagrass | | | | | | | | | | |
| | 3 | Mexican Tea | Spanish Needles | Bermudagrass | Dayflower | Ceasarweed | | | | | | | | |
| | 4 | Guineagrass | Grape | Ceasarweed | Mexican Tea | Balsam Apple | Hairy Indigo | Elderberry | Bermudagrass | | | | | |
| | 5 | Canopy of Guineagrass | Bermudagrass | couple of Amaranthus | | | | | | | | | | |
| | 6 | Paspalum | Bermudagrass | | | | | | | | | | | |
| 4-R | 1 | Orange Tree | Bermudagrass | | | | | | | | | | | |
| | 2 | Orange Tree | Guineagrass | | | | | | | | | | | |
| | 3 | Canopy of Ceasarweed | Hairy Indigo | Bermudagrass | | | | | | | | | | |
| | 4 | Canopy of Ceasarweed | Primose Willow | Dayflower | Nightshade | Hairy Indigo | Mexican Tea | | | | | | | |
| | 5 | Canopy of Ceasarweed | Hairy Indigo | Spanish Needles | Florida pusley | | | | | | | | | |
| | 6 | Bermudagrass | Ceasarweed | Hairy Indigo | Tasselflower | | | | | | | | | |

*C = control block; R=release block.