Thrips Order: Thysanoptera; Family: Thripidae

Tobacco thrips (*Frankliniella fusca* (Hinds))
Western flower thrips (*Frankliniella occidentalis* (Pergande))
Flower thrips (*Frankliniella tritici* (Fitch))

Description:

Adult: The adults are tiny insects, generally measuring only 1 to 2 mm in length. They have thin bodies and vary in color from near black to straw colored. Although some species are generally darker than others, color is not a good characteristic for identification. Adults have two pair of wings that consist primarily of fringe hairs. Mouthparts pierce plant tissues and remove plant sap but are frequently described as rasping. Separation of species requires microscopic examination.

Western flower thrip

Immature: Larval thrips are similar in body structure to adult thrips but lack well developed wings. Wing pads are visible on prepupae and pupae. Larval thrips are generally lighter colored than the adults and vary from near white to tan to pink.


Tobacco thrip feeding on flue-cured tobacco

Biology:

Life Cycle: The life cycle of thrips is greatly influenced by host plant, temperature, and diet. Females lay from 10 to over 100 eggs dependent on species and host plant. Flower thrips reproduction is greatly increased with pollen added to the diet. Eggs are placed into plant tissue and generally hatch in 3 to 5 days, but they can last 10 to 12 days under cold conditions. The two larval instars are the only feeding immature stages and last 3.6 to 12 days dependent on species and temperature. The prepupa and pupal stages generally occur in the soil and last 2.5 to 13 days. The life cycle from egg to adult is 2 to 3 weeks during favorable weather but can be greatly extended during the winter. Adults generally live for about one month.

Leaf spot symptoms of TSWV

Distribution: Thrips are present and generally active throughout the year in southern Georgia, with highest populations generally occurring in late Spring. There are 3 to 5 generations reported in north Florida and likely similar numbers in Georgia. In fruiting vegetables, tobacco thrips will tend to dominate the population prior to blooming as they readily feed and reproduce on foliage. Flower thrips species populations can increase dramatically in crops at flowering when pollen availability increases. Also, the presence of tree pollen in the spring has been associated with increased thrips reproduction.

Damage:

While thrips can cause direct damage to foliage and fruit, their role as vectors of tomato spotted wilt is of primary concern, especially in tomato and pepper. Thrips are cryptic in nature, preferring to feed in tight secluded places such as the plant terminal and blooms. Immatures are rarely seen outside of these sites. Feeding on foliage

Stunting and leaf necrosis on field-grown tomatoes due to TSWV

causes young leaves to curl upward and gives older leaves a silvery or speckled appearance. Feeding within blooms on the ovary of flowers can result in malformed, stunted or discolored fruit, and oviposition into small fruit can also cause deformities or halo spotting. Generally, any direct damage is overshadowed by the impact of TSWV transmission in tomato. Tomato spotted wilt virus (TSWV) is transmitted exclusively by thrips and especially by western flower thrips and tobacco thrips. The initial symptom of this disease is usually a spotting of the leaf. This is followed by a wilting of the plant, and by mid-season this can clearly be seen as short, distorted plants in the row. Plants infected early in development do not produce fruit. The fruit from infected plants later in development is usually unmarketable and can display irregular ripening symptoms. This ripening problem can show up after tomatoes have been treated with ethylene for the ripening process. For this reason, tomato spotted wilt infected plants are typically not harvested at all. Thus, every infected plant represents a total loss in yield for that plant. For more information on TSWV see https://tswv.caes.uga.edu/

Management:

Thrips populations can be monitored in a variety of ways including various methods of beating plants to dislodge thrips into a collection device (styrofoam cup, white tray, sticky trap), collection of blooms, plant terminal washes for larvae, or colored sticky traps for adults. UV-reflective plastic mulch has proven useful in suppressing thrips populations and TSWV. Insecticides are generally used in a preventative method to suppress thrips populations where early transmission of TSWV to the crop is of concern. In vegetables, preventative imidacloprid treatment of seedlings only reduces tobacco thrips and is not recommended for western flower thrips. The diamide insecticides and spinetoram generally control better both tobacco and western flower thrips. Thresholds vary by crop and species. Western flower thrips has been shown to cause fruit damage in peppers at populations as low as 2 per bloom; however, in most crops practical action thresholds vary from 5 to 10+ thrips per bloom. Where viruses are of concern and you attempt to manage thrips with insecticides, thresholds are zero and pesticides must be applied preventatively. Foliar damage can require treatment as well, with most applications triggered by obvious foliar damage and the continued presence of high populations. In some crops, such as beans and peas, foliar damage can be obvious but does not justify treatment if growing conditions are good as these crops quickly outgrow this damage.

David Riley, Alton Sparks, Entomologists, University of Georgia, 2022