

# Those Annoying Little Flower Thrips

My coworker, Dana Faubion and I surveyed Washington growers and fieldpersons about the educational and research needs of the soft fruit industry back in 1999. Surprisingly, the insect that was ranked the leading problem in soft fruit production was thrips. Here in the Pacific Northwest and throughout orchards in western North America, the primary thrips pest is the western flower thrips, *Frankliniella occidentalis* (Pergande). Western flower thrips are minute, slender-bodied, pale yellow to dark brown insects less than 1/16 of an inch in length. They resemble small splinters of wood, but rapidly glide or slither around in your hand. The adult thrips does have two pairs of fringed wings and can suddenly disappear as they fly away.



1A) An adult Western flower thrips, 1B) another slightly darker western flower thrips

There are many species of thrips. Some are considered beneficial insects that are predatory on other insects. Most thrips are plant feeders and the western flower thrips is a pest over a wide host range of plants including apples, plums, nectarines, oranges, lemons, alfalfa, potato and feeds on several weed species as well. Adult thrips are attracted to flowering plants and trees. They feed on pollen and young succulent plant tissues. They have short piercing mouthparts that "rasp" the surface of tissues, sucking out the chlorophyll and other contents of the epidermal cells.



2A) Six-spotted thrips is a predator that feeds on mites, 2B) pear thrips is considered a pest in pears, 2C) typical

*damage on avocados caused by avocado thrips feeding on fruit surface.*

A primary concern to growers in the Pacific Northwest is the damage that the western flower thrips can inflict on apples, plums and nectarines. Pre-bloom feeding by large populations of thrips can deform flower blossoms and reduce fruit set. Thrips feeding is also thought to weaken fruit tissues and make them more susceptible to frost damage. Thrips may also feed on young shoot tips and can deform or kill the youngest leaves. Adult thrips may oviposit eggs on the leaf or fruit tissues. When they lay eggs in apples or plums, light-colored blotches or "pansy spots" will form around a shallow circular scar on the surface of the fruit. Early-instar thrips nymphs may damage fruit surfaces, especially the highly colored nectarine varieties, by feeding on the epidermal cells. This feeding damage can occur early in the fruit's development and lead to a corky or russeted fruit surface. Later in the season as the fruit begins to mature, feeding damage results in a irregular silverish or whitish surface discoloration.



*3A) Western flower thrips damage to apples, "pansy spot", 3B) Western flower thrips damage to nectarine.*

Thrips overwinter in plant debris on the ground in protected areas inside and outside of the orchard. When the warmth of spring arrives they become active and seek out flowering plants like the blossoms on fruit trees. They will invade fruit trees during the full-pink stage and feed on flower pollen and tissues. Female thrips insert eggs within soft plant tissues like developing shoots, leaves or fruit. These nymphs hatch and feed on the soft tissues. The nymphs resemble smaller versions of the adults without wings. When mature, the nymphs drop to the orchard floor and pupate among the plant debris at the soil surface. The whole life cycle can occur quickly and the western flower thrips can go through 5 to 6 generations per year.



*4A) Immature western flower thrips, 4B) Fruit tree in bloom are very attractive to adult Western flower thrips.*

The first line of defense in managing orchards with a history of thrips problems is ground cover management within and around the perimeter of the orchard block. The western flower thrips loves dandelions in bloom. Blooming dandelions in the ground cover serve as a beacon drawing thrips into the orchard before tree bloom. As the dandelions dry up, the thrips will move up into the canopy of the fruit trees and find the soft growing tissues or maturing fruits as a suitable host. In these orchards, it is recommended that growers DO NOT disc, mow or allow their ground cover to dry out just before or while the trees are in bloom. This may force the thrips up into the tree canopy at a time when thrips can cause the most damage. Furthermore dandelions can out-compete fruit trees for the pollinating services of honey bees, so growers are advised to clean out those dandelions with a fall-applied herbicide.



*5A) Weeds found in the orchard ground cover, particularly dandelion, serve as beacons to draw thrips into orchard early in season.*

Currently, chemical management of thrips attempts to reduce the overwintering and first generation populations. The WSU Crop Protection Guide recommends growers apply formetanate hydrochloride (Carzol 92SP) or endosulfan (Thiodan) at pre-bloom or petal fall in apples, peaches and nectarines. Research by Dr. Dan Mayer, WA State University, indicates that growers get about one week's control

of thrips with these products. Other organophosphates such as azinphosmethyl (Guthion), dimethoate, diazinon as well as pyrethroids like esfenvalerate (Asana) are recommended in other states for thrips management. Be sure to check the pesticide label for legal application rates and crop uses. Since honey bees are likely to be attracted to the same blooms that thrips are attracted to, growers will have to take special precautions to prevent bee kills.

Later in the season, thrips management becomes challenging. The most effective product, Carzol, can upset mite populations and is not recommended (or legal in most fruit crops in WA) after petal fall or shuck fall in peaches and nectarines. Malathion, Lannate, and Thiodan can be used later in the season to suppress thrips populations. Spinosad (Success) is effective on western flower thrips in apples and may work for managing thrips in soft fruits as well, but this has yet to be proven. As always, read the product label before using any pesticide and take special note of the preharvest intervals for each pesticide and crop.

So if your orchard has a history of problems with these annoying little flower thrips, pay attention to ground cover management first. The next line of defense is a single application of Carzol at pre-bloom or petal fall to knock back thrips populations early in the season. In orchard blocks with a history of thrips damage, or with highly colored nectarine varieties, a number of pesticide products applied later in the season can provide a week's worth of thrips suppression. The preharvest interval for a pesticide may determine which product the grower can select.

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**Photo courtesies:**

1A, 2A, 3B- Integrated Pest Management for Stone Fruits, by L. L. Strand, Univ. CA Statewide IPM Project, Davis, CA; 1B, 3A, 4A- *Orchard Pest Management: A Resource Book for the Pacific Northwest*, Edited by E. H. Beers et al., published by the Good Fruit Grower, Yakima, WA, 1993; 3C- H. Riedl, OR State University, Hood River, OR.

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