

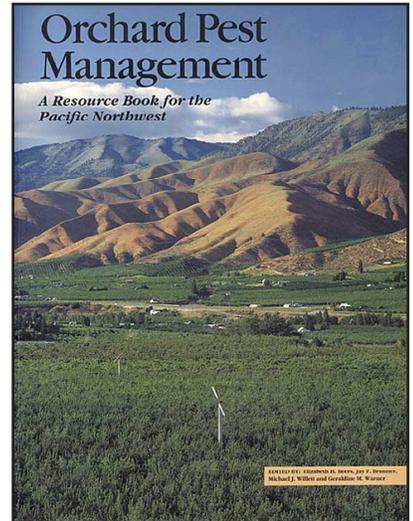
ORCHARD PEST MANAGEMENT ONLINE

Did you know that Orchard Pest Management (OPM) is now available online?

<http://jenny.tfrec.wsu.edu/opm>

OPM provides detailed information about common occurring orchard pests and beneficials in the Pacific Northwest. Each section covers life stages, life history, damage, monitoring, biological control, and manage-

ment. The original soft cover edition of Orchard Pest Management was published in 1993 and is still available for purchase at <http://www.good-fruit.com>. Dr. Elizabeth Beers led the effort to publish OPM online and many others have contributed edits to the various sections. Updates to the online version reflect changes in knowledge and practices and include photographs of life stages, hosts, and damage as applicable.



CAMPYLOMMA

Campylomma overwinters as an egg, which is inserted deeply into the tissue of a woody host plant. Eggs hatch in the spring, beginning as early as tight cluster to pink stage of apple tree development and continuing through petal fall. Egg hatch peaks during or shortly after bloom. One of the most critical periods for sampling is before and during the bloom period, when a control decision should be made. Either a beating

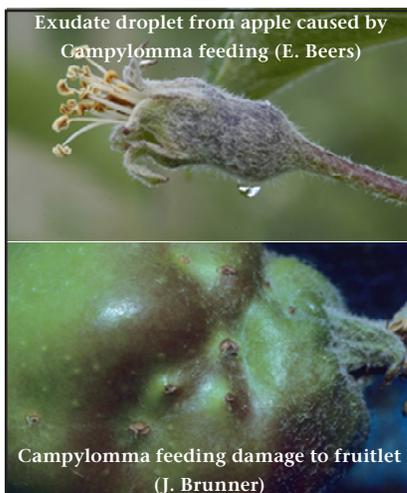
tray or direct visual examination can be used at this time. The beating tray takes less time to cover an area, but direct examination may reveal nymphs that are not jarred from the foliage using a beating tray. Action thresholds for campylomma are currently tied to the beating tray sample method. Action threshold for Golden Delicious and Cameo is 1 nymph/tap. Action threshold for Gala, Fuji, and Granny Smith is 2 nymphs/

Campylomma 2nd instar nymph (E. Beers)



tap. Action threshold for Delicious is 4 nymphs/tap.

<http://jenny.tfrec.wsu.edu/opm>



Exudate droplet from apple caused by Campylomma feeding (E. Beers)

Campylomma feeding damage to fruitlet (J. Brunner)

MANAGEMENT OF CAMPYLOMMA

Campylomma is one of the few tree fruit pests that is also a predator. For a relatively short period around bloom, it feeds on flower parts and developing fruitlets. Early feeding causes a reaction in the fruit, producing a dark, raised corky wart, often surrounded by a shallow depression. Spray timing is the key factor in preventing damage by campylomma. Petal fall sprays may fail to prevent much of the poten-

tial damage, even though they may kill the campylomma present. Pre-bloom and bloom sprays have been more successful in preventing fruit damage. Products recommended for Campylomma are Carzol 92SP and Assail 70WP. While these materials will kill Campylomma at any time, applications must go on at pink or bloom to prevent damage – petal fall is too late.

<http://jenny.tfrec.wsu.edu/opm>

WESTERN FLOWER THRIPS

Thrips have multiple overlapping generations on a broad range of plant species. Adult thrips overwinter in protected places on the ground. When they emerge in the spring they seek out flowering plants. On fruit trees, they enter blossoms at the full pink stage and feed on flower parts. Thrips can easily be monitored by shaking a pink bud or flower cluster into a white plastic cup. Flick the cluster vigorously to ensure that most thrips are dislodged. Adults are easy to detect without magnification, but larvae are light colored

and more difficult to see. Larvae may be confused with small adult males, but they do not fly when disturbed. Sample 5 or 6 clusters per tree and 5 or 6 trees per 10-acre block. Monitor border trees also, as thrips move into the orchard from wild host plants. Sample in the morning, preferably at the same time each day, as thrips densities can change dramatically throughout the day if the weather is warm and calm, which is when they tend to fly. The correlation between thrips densities and egg-laying damage is poorly un-

THRIPS MANAGEMENT

Pansy spot caused by western flower thrips



Pre-bloom feeding deforms blossoms and leaves, reducing fruit set or weakening the fruit so it is more susceptible to frost and temperature stresses. The major damage on apples is due to egg-laying punctures that cause a condition called pansy spot, a whitish discolored area shaped like the petals of a pansy surrounding a

small scar where the egg was laid. On some varieties, the pansy spot disappears by harvest, but on other varieties, especially Granny Smith, the discoloration persists. Recent evidence in central Washington indicates that, although thrips adults are abundant during bloom, the best timing for sprays is later. Oviposition in fruitlets (as opposed to other flower parts) starts to increase about petal fall to 5 mm fruit size. Sprays should be applied just prior to this increase in oviposition. Delaying

Western flower thrips adult (E. Beers)



derstood. However, if there are more than 1 to 2 adult females per apple cluster, there is a risk of fruit damage due to egg laying.

<http://jenny.tfrec.wsu.edu/opm>

applications until after bee hives are removed from the orchard will both reduce potential hazards to pollinators, and broaden the range of insecticides that can be used for control. Products recommended for control of Western flower thrips at petal fall are Carzol 92SP, Success 2F, and Delegate 25WG.

<http://jenny.tfrec.wsu.edu/opm>

Visit PMTP online at:
<http://pmtip.wsu.edu>

Pest Management Transition Project
Washington State University
1100 North Western Avenue
Wenatchee, WA 98801