

Using Sticky Cards to Monitor for Insects

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Yellow sticky cards (YSC) will trap western flower thrips (WFT), whiteflies, fungus gnats, shoreflies and winged aphids in the greenhouse. Sticky cards can help growers detect **early** pest infestations more effectively than will intensive plant sampling. By using sticky cards, growers can keep track of insect population trends and make more informed and timely pest management decisions. However, growers should supplement the information gained from sticky card counts with visual monitoring of their crops.

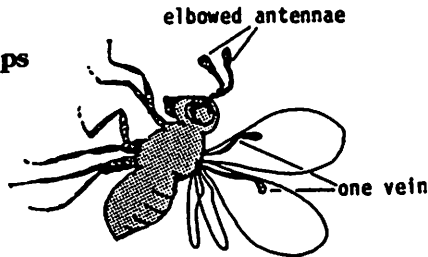
Suggestions on Using Sticky Cards

Use at **least** one card per 1,000 sq. ft., plus additional cards near doors, vents and over insect-sensitive plant species or cultivars. Experiment to see if more cards will help in gathering information at your production range.

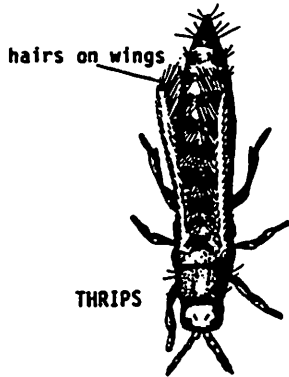
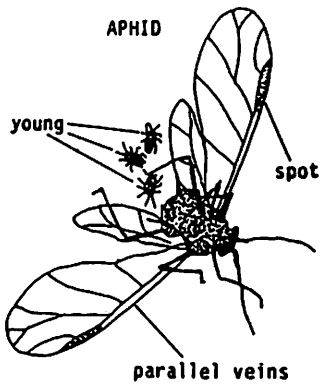
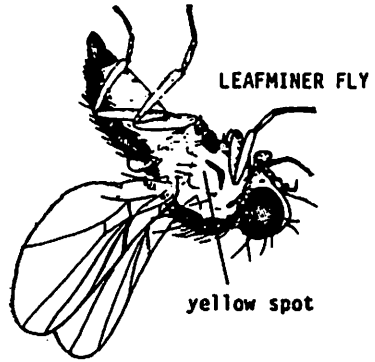
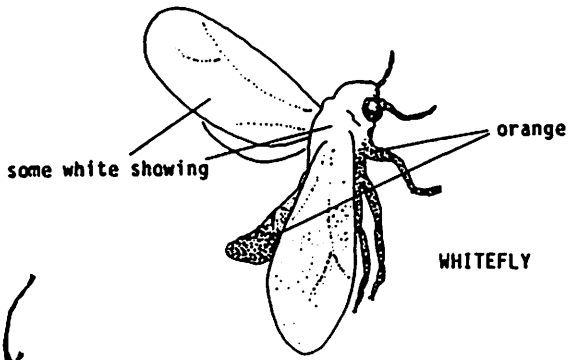
Use a 10x-15x hand lens to see the identifying characteristics of insects caught on the cards. With practice, it becomes much easier to distinguish a shorefly from a fungus gnat or a thrips from a grain of peat moss (see Figure 1. *Insects Frequently found on Sticky Traps in Greenhouses*).

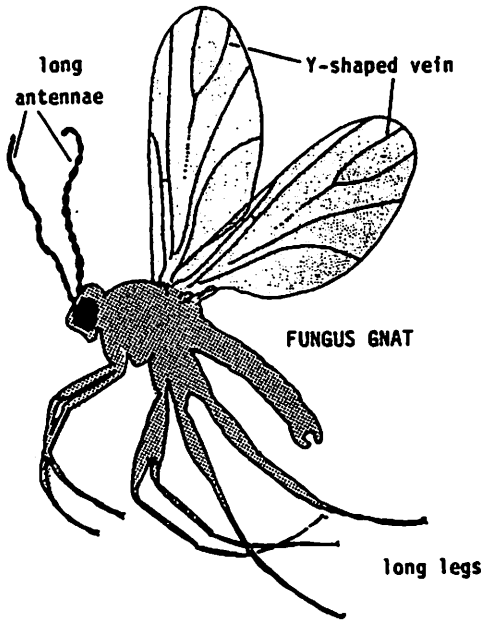
Figure 1.
Insects on Sticky Traps

(Continued on
next page.)



PARASITIC WASP





Cards should be monitored weekly to track trends in insect population development. With increasing temperatures and insect development, spot check cards twice a week. More frequent inspections will allow quicker identification of localized infestations where spot treatments may be beneficial.

Change the cards weekly as the cards will lose their effectiveness in insect trapping as their sur-

face becomes coated with debris. Growers may be able to change their cards less frequently in the winter because of slower insect development and activity.

The costs of monitoring are primarily due to the time spent identifying and counting insects on the sticky cards and not the initial cost of the cards. In one study, California researchers looked at ways that growers may more efficiently use their sticky cards. Yellow sticky cards (4.5" by 5.5") were placed 50 feet apart in three greenhouses where African marigold, verbena, geranium, ageratum, dianthus and petunia were grown. Sticky cards were placed 8 to 16 inches above the crop, and researchers changed the cards once or twice a week. (Note: most growers in New England use 3" by 5" cards for insect monitoring.)

Western flower thrips, greenhouse whiteflies, leafminer adults and winged aphids were caught on the cards. Whitefly catch tended to be uniform, but more aphids and thrips were caught on the bottom half of the cards. There was more variation in trap catch along the length compared to the width of the card.

It was then suggested that growers only need to count a one-inch-wide vertical column in the center of each card to estimate the total numbers of insects caught. Growers can then greatly reduce the time spent counting insects and reduce their monitoring costs. The researchers concluded, however, that growers should not cut their cards to a 1" by 5" size. Larger cards tend to catch a greater diversity of insects than smaller cards, and trap catches tend to increase with size.

Thrips

Light blue cards are more effective in trapping WFT and may be used over thrips-sensitive plants such as roses or African violets. Yellow cards are more effective for general pest monitoring, and adult thrips may be easier to see on a yellow card compared to a blue card. Use a hand lens to distinguish adult thrips from grains of peat moss and other debris. WFT adults are narrow, 0.04 to 0.08 inches long, with two pairs of fringed wings that are held parallel over their body. Females tend to be dark brown and slightly larger than the small, tan or yellow males. Dark brown to black onion thrips may occasionally be caught on cards as they enter the greenhouse from outside.

Cards should be placed just above the crop canopy (1" to 2") to most effectively trap thrips. Placing cards at bench level tends to catch more thrips compared to card placement at hanging basket or floor levels. Card counts may be higher at the ends of the greenhouse, where the passively-carried thrips tend to drop out of air circulation patterns. Under mist propagation, fewer thrips will be caught on sticky cards, as adults are less able to fly, due to the water on their fringed wings. In February, it may be helpful to place cards just above the floor level to detect any early emerging thrips that have overwintered in the greenhouse.

Tolerance levels will vary depending upon the crop, potential damage, time in the production cycle and whether Tomato Spotted Wilt Virus (TSWV) is present. Many growers use a "working tolerance level" of less than 10 thrips per card per week. If TSWV is present, the threshold is as close to zero as possible.

Fungus gnats

Fungus gnat adults are delicate insects with longer legs and antennae than shorefly adults. Adult fungus gnats have a distinctive "Y" shaped vein on their wings (see Figure 1). Horizontal placement of cards just above the soil surface is more effective than vertical placement just above the crop canopy. In one study, red cards were found to be more effective than yellow, blue, white or green cards.

Tolerance levels will vary depending upon the crop, soil mix and time in the production cycle. Earlier detection of low population levels makes it easier for growers to use beneficial nematodes or Gnatrol with greater success. Some growers use a working tolerance level of five to ten fungus gnats per card per week using horizontal card placement.

Shoreflies

Shorefly adults are more robust with shorter antennae than fungus gnat adults. Adult shoreflies have five clear spots on their wings. Horizontal card placement is more effective in detecting shorefly adults than vertical card placement.

Whiteflies

Whitefly (WF) populations tend to be aggregated and not uniformly distributed within the greenhouse. Growers may want to use more cards near whitefly-favored plant hosts such as lantana, flowering maple, hibiscus, rosemary, tomato, chenille plant and regal geraniums. WF adults lose their white color and develop an orangish caste when trapped on the cards. In addition to greenhouse and sweet potato whiteflies, growers may occasionally see banded winged whiteflies. Banded winged whiteflies have a grayish tinge when trapped on cards caused by the two distinct zigzag black bands on their forewings. A few banded winged whitefly have been caught on cards in Connecticut in the early fall (late August to September). They tend to enter greenhouses from outside (ragweed is a host) but cause no damage on poinsettia plants.

Winged Aphids

Yellow cards will only catch winged aphids. Therefore, plant and weed inspection is needed for the early detection of young aphid nymphs. Aphids will have two distinct dark spots on their wings and two cornicles or "tailpipes" at the rear of their abdomen. It is more difficult to monitor for

melon aphids, which are smaller than green peach aphids and less likely to form winged adults.

Parasitic Wasps

Small parasitic wasps may occasionally be caught on sticky cards, especially in greenhouses where there are fewer spray applications. Parasitic wasps usually have elbowed antennae (like ants) and only one vein on their forewings.

In summary, sticky cards can be an effective tool to aid growers in their pest management decision making.

Some Suppliers of Sticky cards and/or handlens

IPM Laboratories
P.O. Box 300
Locke, NY 13092

W H Milikowski, Inc.
75 Chestnut Hill Road
Stafford Springs, CT 06076
(YSC only)

Olson Products, Inc
P.O. Box 1043
Medina, OH 44258

Pest Management Supply, Inc.
P.O. Box 938
Amherst, MA 01004

Whitmere Research Laboratories, Inc.
3568 Tree Court Industrial Blvd.
St. Louis, MO 63122 (1-800-325-3668)

References

Baker, J.R., Identification of Insects on Sticky Cards. *North Carolina Flower Growers Bulletin* 30(1) 12,13.

Brodsgaard, H.F. 1989. Coloured sticky traps for *Frankliniella occidentalis* in glasshouses. *J. Appl. Ent.* 107 136-140.

Heinz, K.M., M.P. Parrella, and J.P. Newman. 1992. Time-Efficient Use of Yellow Sticky Traps in Monitoring Insect Populations. *Journal of Economic Entomology* 85(6): 2263-2269.

McLeod, M. 1991. Monitoring Fungus Gnats and Shoreflies. *Long Island Horticulture News*. October 1991 3.