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Monitoring with sticky traps can save you money

By Julie Newman

Using sticky traps to monitor pests is a standard greenhouse practice that can help reduce overall pest management costs when coupled with plant inspections. Sticky traps are a tool for identifying adult insect pests present in a greenhouse, including whiteflies, thrips, fungus gnats, shore flies and leafminers. Sticky traps can also be used to monitor adult parasitoids released in biological control programs.

Sticky traps only capture airborne adults and do not capture immature stages that commonly cause most crop damage.

Some greenhouse pests such as spider mites, scales and mealybugs are usually not caught on sticky traps. Only winged aphids are captured, and winged forms do not typically appear until population levels are high. For these reasons, sticky traps must be used in combination with visual plant inspections to confirm the presence of economically damaging pest populations.

Sticky trap benefits

Sticky traps provide an easy method for estimating pest population densities. When the timing of pest control actions is based on these relative estimates along with plant sample data from visual inspections, there is generally a reduction in pesticide use. As a result, there are fewer problems with pesticide resistance, less worker exposure to pesticides, reduced pesticide runoff and improved plant quality with less pesticide-induced phytotoxicity symptoms.

In a University of California study that included a variety of ornamental crops, pesticide reductions up to 50 percent occurred in plots where pest control actions were based on sticky trap and plant sample data, as compared to plots where pest control actions were solely based on visual inspections or were calendar-based. Reduced pesticide applications and improved plant quality more than offset the cost of sticky traps and the labor used for monitoring them, resulting in substantial profits for growers cooperating in the study.

There are other significant benefits of using sticky traps in monitoring programs. Sticky traps can provide an early warning of pest presence before plant damage is observed, alerting growers to step up visual inspections. Once pests are confirmed in a crop, slower acting control strategies can be utilized that are more environmentally-friendly and safer for workers.

Sticky traps can also indicate greenhouse hot spots and can document migration patterns when placed near doors and vents. Data collected from sticky traps can be used to evaluate pest management control actions, including the use of natural enemies.

Installing and replacing traps

The number of traps needed depends on many factors, including the main target pest. Unless other guidelines are recommended, use a minimum of one sticky trap for every 10,000 square feet of growing area. Whitefly infestations typically start in scattered areas and may require one trap per 1,000 square feet to get a reasonably accurate picture of insect activity.

Place traps within the cropping area, especially in sensitive cultivars, as well as by vents and doors. Number each trap and map its location.

Traps should be positioned just above the crop canopy and raised as the plants grow. Orienting traps horizontally is sometimes recommended when monitoring pests such as fungus gnats emerging from the substrate. In most programs, orienting the longest part of the trap vertically will catch the most insects.

Inspect sticky traps at least once or twice weekly and replace them after inspection unless the traps are reused. Reusing traps does save on the cost but counting insects on reused traps is more labor-intensive.

Traps should not be left up for long periods because they will become caked with insects, making it difficult to make accurate and quick counts. Generally traps can be counted more efficiently in the greenhouse.

The traps can also be wrapped in clear plastic and taken to a more comfortable location for counting, which could facilitate more accurate identification. This may be necessary if a microscope is needed to identify insects.

Identify and count insects

Accurate data depends on careful identification of the insects. Use a 10-15x hand lens to determine identifying characteristics of insects caught on the traps. With practice, it becomes much easier to distinguish between insects. High-quality color photographs and line drawings of commonly trapped insects are available in the University of California publication "Sticky Trap Monitoring of Insect Pests" (*http://anrcatalog.ucdavis.edu/InsectMiteMolluscPests/21572.aspx*).

To minimize the labor involved in counting insects, simply count the number of each type of insect in a vertical, 1-inch wide column on both sides of the trap. A University of California study showed that when normal-sized traps are used, this rapid technique gives accurate data that can be extrapolated to whole trap data.

Make a 1-inch template to do the counting or use sticky traps that are sold with grids. Do the counting consistently. Don't switch from whole card counts to the rapid method in the middle of the cropping cycle.

Recordkeeping

Keep a record of the number of each pest caught in each sticky trap. If traps are reused, the total number of insects present last time the traps were checked must be subtracted from the current count.

Regularly summarize sticky trap data to facilitate comparison. An easy method for comparing pest densities among sample dates is to graph the average of all traps from each sample date.

Interpreting sticky trap information is not always easy and takes knowledge, skill and practice. Trap data alone may not be a reliable indicator of pest presence or abundance in a crop.

Large numbers of a pest species on traps do not necessarily indicate that control action is needed. This is because traps catch migrating insects as well as adults that emerged from a crop and trapped insects may not be harmful to the crop.

Plant foliage type and density, temperature, air currents and ventilation fans all affect the adults' tendency to fly and the number of those trapped. Pesticide applications and foliage disturbances can also affect trap catches. For example, adult numbers of some species may temporarily increase in traps after applying an adulticide.

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