

NURSERY PAPERS

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EFFECTIVE USE OF STICKY TRAPS

Sticky traps are a valuable aid in monitoring crops to detect early pest infestations, or to demonstrate a property is free of certain flying insects. The traps record and highlight the activities of these pests and, over time, will show population trends and guide the direction for future pest management.

Understanding how to use sticky traps to capture this insightful data, as well as how many to use and where to position them, is an essential part of an Integrated Pest Management plan (IPM).

In this nursery paper, we explore how to place and assess sticky traps in a production nursery and explain the important role they play in a business's IPM plan.

Summary

Constant monitoring for pests, diseases and weeds under a structured monitoring program is one of the most important tasks when growing a crop, which is why the nursery industry's best practice programs include pest management as a requirement.

The programs – widely known as NIASA, EcoHort and BioSecure HACCP – integrate pest management planning as well as best practice across biosecurity and natural resource management.

Each program builds upon IPM philosophies and is a useful tool to reference and source information for production nurseries and growing media suppliers. As part of these, they include ample amounts of information on sticky traps.

WHAT ARE STICKY TRAPS AND HOW DO THEY WORK?

There are several different brands marketing sticky traps, however they all function in a similar way. Sticky traps are usually made of paper or plastic with a strong adhesive backing designed to trap insects upon contact.

Two primary colours are used for sticky traps most notably yellow and blue. Yellow cards are attractive to a wide range of insects including Tomato Potato Psyllid (TPP), Western flower thrips, whiteflies, fungus gnats, shore flies, leaf miners and winged aphids. While blue cards are more attractive to thrips and can be used to detect low thrips populations.

Insects unable to be trapped include mites, mealybugs, scales, wingless aphids, and immature stages of thrips and whiteflies. Growers will need to consider other monitoring methods such as visual crop inspections for these insect types to complement a sticky trap program.

Sticky traps can demonstrate that pests are present in a crop or that a property is free from certain pests. They're not designed as a holistic management tool, but do provide production nurseries with a starting point to act if insects are present.

For example, if a production nursery is capturing a small number of adult aphids it would be sensible to visually inspect the crop for young aphids, which are likely to be present and can cause further damage.

A closely related product to sticky traps are sticky ribbons, which are long rolls or ribbons of material coated in a sticky substance. Whilst sticky traps are primarily designed for monitoring, sticky ribbons are designed for pest control through mass trapping and are used to encircle crops.



Examples of sticky traps.



FIGURE 1 Sticky Ribbons being used for control of Fungus Gnats

WHERE TO POSITION THE STICKY TRAPS

There's plenty of information about where to place sticky traps in the production nursery such as in the NGIA BioSecure HACCP manual, which is available online in electronic copy (www.nurseryproductionfms.com.au). The manual has a list of recommendations, these include:

- Attach each sticky trap to a wire, wood stake or other instrument, which allows the trap to be moved as the crop grows. Pegs, or gator clips, on the stakes are a cost-effective way to attach the traps.
- Place traps equally apart in a Z or M pattern across the area.
- Ensure that the bottom of the trap is as close to the top of the crop's canopy as possible.
- Position the trap to suit the pest you are trying to monitor. For example, face the trap to the soil if monitoring for fungus gnats, but for general use, position the traps or cards vertically.
- If possible, avoid placing near sprinklers.
- Place traps near entrances and vents to detect any pest migration.
- If using in an unprotected area, pay attention to the wind direction and place them down wind. The prevalence of dust should be considered as it degrades the efficacy of the traps.
- Small production areas <500m² can be monitored as one unit (e.g. a small greenhouse/growing bed) whilst larger areas can be divided into sections to facilitate easier monitoring.

HOW MANY STICKY TRAPS TO USE

Deciding how many sticky traps to use is based on the crop, pest pressure, budget, timing and of course, season. Obviously more traps increase the sensitivity of the monitoring, however this requires more time and labour to manage and monitor and may not be economically viable. As a minimum, the BioSecure HACCP guidelines recommend the following numbers of traps/area:

OPEN FIELD/GROWING BEDS		GREENHOUSE/POLYHOUSE/GLASSHOUSE	
TOTAL AREA (HA)	NO. OF TRAPS	TOTAL AREA (M ²)	NO. OF TRAPS
<0.5	6	0 – 200	1
0.5 – 1	10	200 – 500	2
1 – 5	12	500 – 1000	4
5 – 10	15	1000 – 5000	6
>10	20	5000 – 10000	10



CREATING A STICKY TRAP REGISTER

Every production nursery should have a site plan that identifies the different areas of production.

A site plan is required under the EcoHort and BioSecure HACCP programs as a management tool, which allows the business to visually assess activities and plan operations.

When using sticky traps, it's important to record where they have been placed. A simple way to do this is to maintain a sticky trap register.

The register records where the sticky traps have been placed (this information relates to your site plan), the specific ID the trap has been allocated, the inspection interval and the date they should be replaced.

Recording the date and the unique ID code on each trap is essential, as this ensures your register is up to date and accurate.

As such, having a well-developed site plan makes this process work effectively and allows growers to pinpoint trap locations around the site.

WHEN TO INSPECT A STICKY TRAP

Inspecting sticky traps is a vital part of the process. It is recommended that growers follow the below guidelines when checking traps:

- Inspect traps for insects that have been captured at **least once per week**. Two to three times a week is recommended during high risk periods/high risk crops.
- Briefly observe the trap to ensure functionality in between longer inspections. If it's covered in dust or fallen off, been knocked over or damaged in some way, replace the trap ensuring the date and unique ID are recorded on the new trap and register.
- Sticky traps that are not due for replacement are inspected in-situ.
- Traps due for replacement may be inspected in-situ or removed for counting at another location. It is best practice not to reuse the traps, however if they are reused, a careful insect capture count should be recorded on the trap for comparison ahead of the next inspection.

WHO SHOULD INSPECT THE STICKY TRAP?

The staff member performing the inspection should be equipped with the right tools and information they need, to ensure the process is carried out effectively.

Staff training in pest identification is important and is available online via the Nursery Production FMS website (www.nurseryproductionfms.com.au) including courses through the e-learning portal.

Below are examples of what staff may see on sticky traps and why training is important.

Staff should be provided with the appropriate equipment to perform the inspection including:

- A handheld lens (10x/20x)
- Sticky trap monitoring sheet
- High quality images of the pest (or access to a database such as www.pestid.com.au)
- Zip lock bags, plastic wrap
- A handheld tally counter
- A dissecting microscope (recommended for a production nursery)
- A smartphone or digital device to capture good quality images and data for further analysis.



FIGURE 2 Fungus Gnats on Sticky trap

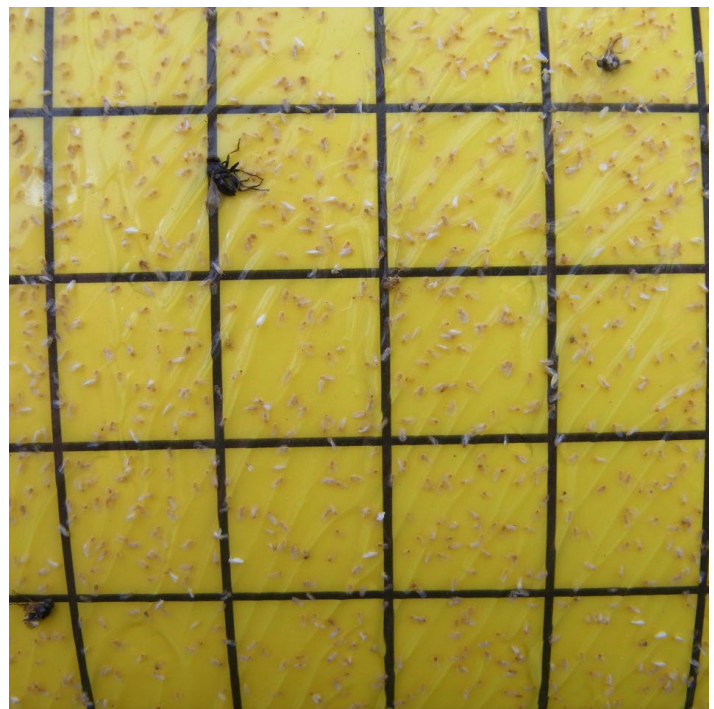


FIGURE 3 White fly on sticky trap



HOW TO INSPECT A STICKY TRAP

1. Approach the trap and identify if any insects are stuck on the trap.
2. If insects are present, using an identification guide, identify and record all insects present on the trap. Save time by counting insects within a 2.5cm wide, vertical column down the sticky trap or as per the manufacturer's directions if a grid pattern exists on the trap.
TIP: if using this method, make a note to ensure consistent comparisons between inspections.
3. Note any beneficial insects if present on the sticky trap.
4. If a trap needs replacing, remove it from the trap attachment, loosely wrap in clear plastic (e.g. cling wrap) and place in a zip lock bag to be stored, mailed or counted at another location. Any new trap must retain the unique ID number and be marked with date of new installation.
5. Complete a sticky trap monitoring record for pests and beneficial insects that are detected.

To support accurate identification of insects, access to identification tools is vital. The nursery industry has its own specific online database including the Pest ID Tool (www.pestid.com.au) which is tailored to a broad range of crops grown by industry. If you're unable to identify the insects captured on the

trap, seek professional assistance to ensure correct identification.

Grow Help Australia, as part of the levy funded NY15002 project *Building the resilience and on-farm biosecurity capacity of the Australian production nursery industry*, provides ID and pathology services for industry. Production nurseries can apply for a discount, and NIASA accredited businesses receive 10 free diagnostics per year.

THE BENEFITS OF USING STICKY TRAPS

There is more to gain than just the biosecurity benefits of a sticky trap. Once traps have been placed in the production nursery and a consistent inspection process is in place, there is potential for the business to use the data collected.

Staff can monitor sticky traps alongside their crops to provide a clearer picture of any production issues faced in the nursery. A spreadsheet can be developed that includes details of the sticky trap in accordance to calendar months, which can help predict trends or tendencies at certain times of the year.

Adding in other factors such as the weather enables growers to develop strategies that are proactive about pest issues. Sticky traps can also be a valuable tool to help establish data on beneficial insects in crops.



A sticky trap being used in a nursery.

Insects caught and plotted against the data can be used to assess the efficacy of any treatments or control measures applied such as a certain pesticide application's effectiveness right through to the impact of beneficial insects on the pest population.

All this data helps to better inform sound business decisions particularly around expensive inputs such as resourcing, pesticides and other crop protection methods.

Data collection and record keeping are effective tools to build a successful Integrated Pest Management plan, as well as lift business productivity and profitability.

LINKS TO RESOURCES

The Nursery Production Farm Management System (FMS) Manuals NIASA, EcoHort and BioSecure HACCP available at www.nurseryproductionfms.com.au

Pest ID Tool available at www.pestid.com.au

QLD Department of Agriculture and Fisheries Grow Help Australia www.daf.qld.gov.au/business-priorities/plants/health-pests-diseases/plant-pest-diagnostic-services/grow-help

NSW Department of Pests, Diseases, Disorders and Beneficial's in Ornamentals_ Field Identification Guide www.tocal.nsw.edu.au/publications/list/horticulture/pests,-beneficials,-diseases-and-disorders-in-ornamentals

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