



Scouting for Pests in High Tunnel Production: A Beginners Guide

Cheryl Frank Sullivan & Margaret Skinner
University of Vermont, Entomology Research Laboratory

January 20, 2023

<https://www.uvm.edu/~htunnel/>

Scouting is the cornerstone of successful integrated pest management (IPM). The main goal of a scouting is to detect pests before they become a problem that reduces crop yield and quality. This basic high tunnel scouting checklist should be adapted to your situation, but make sure you do SOME sort of scouting to protect your investment.



Fig. 1. Sticky card in high tunnel crops.

Checklist of essential tools and strategies:

- Magnifying tool.** There are many options available (i.e., jeweler's loupes, magnifying glasses, Optivisor headband, USB mini microscope). Choose one that works for you. Magnification should be at least 10×. It's best to carry a small magnifier at all times, either on a lanyard or clipped on so you don't lose it.
- Yellow sticky cards, stakes/holders.** Sticky cards (Fig. 1) placed near the crop catch adult insect stages. Trapped insects can be circled with a waterproof marker so you can get accurate weekly counts. Sticky cards should be combined with plant inspections (see page 2) to detect immature stages and non-flying pests (i.e., mites, wingless aphids). Here is a useful [form](#) to keep track of card counts.
- Flagging tape/colored flags.** When pest infestations are detected, plants/locations should be marked. These plants should be inspected over time to track changes in pest levels and assess if your management is working. These are called 'indicator plants'. They are used to monitor natural enemy-pest ratios and help you decide if more natural enemies should be released or pesticide applications made.
- Record keeping.** A standard record system should be set up that works for you, either an App on your phone or a [paper form](#). Collect all papers in a notebook or file folder on your computer so you can refer back to them easily. When collecting data on pest numbers, always include the date, ID of the pests/beneficials, number of pests/natural enemies, location within tunnel. Several other examples can be found at [Pest Monitoring Record-Keeping Forms \(UMASS\)](#) and page 25 of the [IPM Scouting Guide for Common Problems of High Tunnel and Greenhouse Vegetable Crops in KY](#). Making simple graphs can help you to visualize pest-natural enemy trends over time within and between years.
- High tunnel map.** A simple diagram of the high tunnel can help to track where pest outbreaks occur. In the short term, they allow you to assess the effectiveness of treatments and/or track if a problem is spreading. Over years, maps help determine if pest outbreaks recur in the same place annually. If so, these areas should be the highest priority for scouting and treatment. Here is a generic [tunnel map template](#).
- Soil test kits/pH-EC meter.** High tunnel soils behave differently than field soils, largely because of the lack of rainfall and high rates of amendment inputs. Therefore, certain nutrients and salts may accumulate over time. It is important to use a soil test that measures nutrient salt buildup and nitrate carryover. See the factsheet "[Soil Testing in High Tunnels](#)" for soil testing specifics.

- Designated scout.** Who will do the scouting? Ideally the same person should scout every time, and this person should receive training on ID of beneficials, key pests and diseases as well as the symptoms of infection, abiotic disorders or feeding damage. A knowledge of what all the insect life stages look like, and where to find them is critical. Specimens should be sent to a local specialist for identification before taking management action (see links for ME, NH and VT below). All staff who handle or water plants should also know what the key pests and the damage look like and be instructed to notify the pest manager of a potential problem.
- Scout transplants/Incoming plant material.** Start clean to stay clean! The propagation house should be a primary focus for scouting early in the season. If plants are purchased elsewhere, they should be inspected immediately upon arrival. If issues are found, the plants should be isolated and treated or destroyed to avoid problems later in the season. It's easier to manage small, localized infestations than after they have been planted out in the tunnel.
- Regular crop inspections.** A laminated piece of white paper is useful to tap plants over. This allows you to observe dislodged pests. Tap each plant you inspect the same number of times to obtain comparable data. the plant the same Plants should be examined as often as possible, esp. early in the season. Ideally, scouting should be done weekly, but every 2 weeks is a good compromise. For summer crops, check at least 5 plants/100 ft of row (1/20 ft interval); in winter greens, 10 plants/100 ft of row (2/20 ft interval). Alternatively, you can scout greens using a 10x10 inch square per interval. Visually divide the plant (sample unit) into 3 levels or areas (lower, middle, high vs. outer, middle, and center). In each area, randomly select 3 leaves to visually inspect. This gives a representative sample of the whole plant. Try '[Plant-mediated IPM systems](#)' to attract and detect pests like spider mites and thrips.
- Remove weeds and inspect remaining plants before transplanting new crops.** Pests can be carried over season to season on weeds or plants that are left behind from the previous cropping cycle. Fallowing the tunnel for a few weeks reduces these pest problems. If fallowing is not part of the production plan, it is essential to know what pests are in the tunnel so they can be managed to avoid infesting the new crop. Check these plants for pests prior to removal. Keep tunnel as weed free as possible and mow or use weed barrier on outside edges to discourage pests.
- Collect the right information.** Critical data include: 1. What pests are infesting the crop at what time of year?; 2. How many plants are infested ('what % of the crop?'); (3) What is the infestation level per plant? (ideally the estimated number per plant). This information is needed so pest management specialists can advise on the best action. If biocontrol is used, the proper release rate depends on this information. Often, biocontrol fails because the release rate was too low for the pest population. This information is also useful for anticipating what issues may occur and when in future years. This will allow you to release biocontrol agents preventatively. If issues persist, address some of these '[Critical Questions to Help You Manage Persistent Pest Problems](#)'.
- Support network.** Identify key people to ask for advice. Product suppliers usually have tech support staff who can provide advice on fertility, biocontrol use and pesticide choices. Don't forget to use your local diagnostic clinics. We are here to help YOU! [Vermont](#) | [New Hampshire](#) | [Maine](#)

For specific pests and their management strategies view the 2023-2024 [New England Vegetable Management Guide](#). This is a comprehensive resource of current production and pest management techniques for commercial vegetable crops in this region.

Additional Resources:

- **Insect Scouting in High Tunnels.** (2020). Illinois Extension (video): https://www.youtube.com/watch?v=mP05_Jm99JI
- **How to Protect Your Plants from Pests in a High Tunnel.** (2017). UKNOW How-to Iowa State Univ. Extension (video): <https://www.youtube.com/watch?v=u5evFn-8Cfk>
- **High Tunnel Vegetable Crops: Designing a Scouting Plan** (2023). PennState Extension and Univ. of VT: <https://extension.psu.edu/high-tunnel-vegetable-crops-designing-a-scouting-plan>