

## Integrated Pest Management Scouting in Vegetable Crops

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Scouting and monitoring for pests is a critical step in quantifying the potential damage that can be caused by a pest and implementing management strategies that are appropriately timed for maximum effect. Scouting also helps growers determine when insect pests become active or arrive, which species are present and their relative population size in the field. Scouting is also critical for detecting early symptoms of disease, which is important in vegetable transplants to avoid introducing infected seedlings into fields, and during the season to adjust management tactics as needed such as tightening spray intervals.

Scouting for diseases includes monitoring the crop for symptoms, like leaf spots, and signs, like visible fungal colonies. Scouting for insect pests includes scouting fields to detect arrival of critical pest life stages – egg, immature or adult – or signs of their activity, including entry holes and frass, which is insect excrement. In many cases, monitoring also involves collecting data on insect pest population size or level of damage, and relating these data to economic thresholds to make control decisions.

Growers should keep records of their scouting, including maps of their fields, a record of sampling and pest pressure, as well as the control measures utilized including specific tactics and material rates and application dates. Scouting should begin in the greenhouse when vegetable transplants are being raised (see “Integrated Pest Management in Greenhouse Crops,” E3296), and continue during the growing season. One of the biggest benefits of scouting is it increases the chance you will notice problems before they get out of control.



Frass is a sign that a pest is active. This plant should be closely inspected.

### Tools for scouting

Scouts may find the following tools useful:

- **Hand lens** for inspecting small insects, mites, insect eggs or feeding damage.
- **Small tally counter** to keep insect counts accurate.
- **Traps of various forms** that may or may not include lures to attract insects.
- **Camera** for taking quality pictures.
- **Sweep net** for collecting insects from foliage.
- **Shovel or spade and containers (paper bags, cups)** for collecting plant, disease and insect samples.
- **Cooler** for transporting and preserving samples.
- **Permanent marker** to label containers with pest samples.
- **Diagram of your fields** made by hand or graphing program.

- [Crop-pest scouting sheets](#) for data collection.
- **Reference materials** for helping identify pests (find these resources at [Michigan State University Extension Bookstore](#)).
- [MSU Diagnostic Services submission forms](#) to guide information gathering and streamline sample submission.
- **Contact information** of [MSU Extension vegetable educators](#).

## Methods for scouting

In order to make the most out of your time spent scouting, consider the following general recommendations:

- Section fields into manageable portions based on location, size and crop or variety and scout them separately.
- Walk a path in the field that allows you to scout pests throughout your crop. Common transects are walking in an X or a W pattern to cover the whole field.
- Walk a different transect each time you scout. Reexamine hotspots weekly where you previously recorded high pest populations.
- Scouting each field weekly is recommended. If degree day tools or biological information are available to predict the emergence or arrival of certain pests, use them to gauge when you might scout more intensively.

## What am I looking for?

One of the hardest things to learn about scouting is how to pick up on the visual cues that something is damaging the crop. Damage can come in many forms. Consider the following signs of insect damage and disease:

- Cupped, chlorotic, spotted or malformed foliage.
- Discolored, damaged, swollen or sunken areas in plant tissues.
- Insect feeding, such as holes in leaves, entrance holes in stems, chewing or rasping damage, or their frass (excrement).
- Aggregation of insects.
- Pockets of less vigorous or dying plants.
- Anything out of the ordinary.



Ragged holes on this cabbage leaf are cause for further inspection.

## Trapping

In some cropping systems, traps are utilized to capture pests. They may be baited with attractants, such as plant volatiles or pheromones, or provide a visual cue that lures in the pest. Pheromone traps often mimic females to draw in males and plant volatiles often mimic the host plant. Traps that provide a visual cue may mimic a plant, leaf or fruit, depending on the crop and pest. Follow these general guidelines to get the most benefit from insect trapping:

- Place traps at least two weeks before the projected emergence of the target insect.
- Follow manufacturer or university recommendations on the number of traps per block or field.
- Place traps based on manufacturer or university recommendations.
- Check and clean traps at least weekly. Consider checking them more often until the first catch of the season or when emergence is happening quickly and traps are becoming dirty more frequently.
- Replace attractant lures as recommended and store them in the freezer to preserve them.



Left: Trap for monitoring squash vine borer in zucchini. Right: Pheromone trap placed to monitor European corn borer.

## Consider the weather

Growers can use historical and forecast weather data to determine when to initiate scouting for specific pests and diseases and to apply controls at times these will be most effective. Degree day models are available for many pests and can be tracked using locally accurate degree day information available via [MSU Enviro-weather](#). Some models even use forecast data to estimate when important events, such as egg hatch, adult flight or spore release, will occur. This can inform you of when to intensify your scouting for certain pests and disease, when to apply a pesticide to optimize treatment and when the ideal conditions might occur to apply a spray.

For more information on integrated pest management of vegetable crops and other vegetable production topics [subscribe to the MSU Extension Vegetables newsletter](#).



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