

Integrated Pest Management Scouting in Field Crops

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Scouting and monitoring are critical steps in pest management that allow managers to quantify pest pressure and the potential for crop damage. Information gathered in the scouting process can be used to determine if pest control measures are warranted, select appropriate control technologies and time them for maximum effect.

Scouting in field crops may target insects, weeds, disease or even abiotic stresses not caused by pests. Regardless of the target in mind, **a scout's primary goal should be regular, systematic monitoring of a crop that permits accurate and timely decision-making.** Achieving this goal is dependent on adhering to the following four core practices:

1. Collect necessary background information.
2. Use the proper tools.
3. Be timely and use representative sampling methods.
4. Keep proper records.

Background information

One of the most fundamental and challenging aspects of scouting is recognizing visual cues indicating something is damaging a crop and linking that damage to possible causes. For this reason, scouting must be based on prior knowledge of field conditions and management history, the crop being grown and common pest species. This information is frequently drawn from personal experience, but can also be accessed through the following resources:

- Local weather data.
- Soil survey maps.
- Aerial or satellite imagery.
- Farm management records.
- Crop and pest management reference materials.
- Michigan State University Extension educators.
- Private consultants and scouts.
- Farm input suppliers.
- Other farm managers.

Historical and forecast weather data is perhaps the most valuable information available to a scout, as crop and pest development are strongly influenced by temperature and moisture. Degree day models are available for many pests and can be customized using locally generated information available via MSU Enviro-weather. Some models even use forecast data to predict when important pest events (e.g., egg hatch, adult flight, spore release) will likely occur.

The screenshot shows the MSU Enviro-weather website interface. At the top, it says "MICHIGAN STATE UNIVERSITY" and "Enviro-weather Weather-based pest, natural resources, and production management tools". Below this is a navigation bar with links for "Tools for: Field crops | Fruit | Trees | Turfgrass | Vegetables | Landscape & Nursery | More weather". The main content area is titled "Lapeer, Michigan" and displays "Latest observations at Lapeer" for 11/17/2015 at 08:00 AM. It lists various weather metrics: Air temperature (43.3 F), Rainfall (0.0 in), Relative Humidity (95.3%), Dewpoint (42.0 F), Wind Direction (ESE), Wind Speed (4.1 mi/hr), and Leaf Wetness (100% wet, 0% dry). There are also links for "Weather observations and summaries" and "Degree-day tools". A sidebar on the left lists resources for different crops: Alfalfa, Corn, Soybean, and Wheat, each with sub-links for development, pest management, and resources. A map of Michigan is visible on the right side of the page.

MSU Enviro-weather offers degree day models for many field crop pests and be customized using locally generated information.

Tools for scouting

Collecting high quality, useable information requires the right tools. Make the job easier by constructing a basic scouting kit including:

- **Reference materials** for determining crop growth stages and identifying pests (find these resources at the [MSU Extension Bookstore](#)).
- **Maps of fields to be scouted** (aerial or satellite imagery from the Internet or other source, soil survey or hand-drawn).
- **Crop-pest scouting sheets** for data collection.
- **Clip board** for holding paperwork.
- **Hand lens** for inspecting small pests or pest damage symptoms.
- **Hand tally counter** to keep pest counts accurate.
- **Camera** for taking quality pictures.
- **Knife** for dissecting plants.
- **Shovel or spade and containers (paper bags, cups)** for collecting plant, disease and insect samples.
- **Permanent marker** to label containers with plant or pest samples.
- **Sweep net** for collecting insects from foliage.
- **Small cooler** for transporting and preserving samples.
- **Contact information** for [MSU Extension field crop educators](#).
- [MSU Diagnostic Services submission forms](#) to guide information gathering and streamline sample submission.



Left: Sweep nets are used to scout for insects in alfalfa. Right: Resources found in a good scouting kit include a clipboard, paper bags, crop scouting forms, a knife and reference materials.

Methods for scouting

To collect representative information and make the most out of time spent scouting, it is recommended scouts consider the basic procedures outlined below:

- Scouting should begin as soon as plants begin to grow or pests become active and should continue until the crop is harvested or the risk of pest pressure has passed.
- Scouting fields weekly is recommended. If degree day tools or biological information is available to predict the emergence or arrival of certain pests, use them to gauge when you might scout more intensively.
- Section fields into manageable portions based on location, size, crop or variety and scout them separately.

- Walk a path in the field that allows you to assess the crop broadly. Common approaches are walking in an X or a W pattern to cover the whole field. Walk a different pattern each time you scout, but also remember to reexamine hotspots where you have previously encountered high pest pressure.
- Within a broad scouting pattern, select five widely spaced points and at each point check a minimum of 10 plants and 100 square feet of surrounding ground for signs and symptoms of pest pressure or abiotic stress. Examine all parts of crop plants including leaves, stems, roots and reproductive portions.
- Determine the distribution of issues encountered. Is the problem scattered randomly throughout the field or occurring in a recognizable pattern that could be attributed to a particular pest species or past management operation?
- Attempt to identify any signs or symptoms of pests encountered in scouting. Consult reference materials and pest management professionals for assistance. Once an issue is identified, use information regarding its abundance or damage to the crop to make control decisions.



Armyworms visible on wheat heads.

Recordkeeping

Scouts should keep records of their scouting to indicate where exactly a problem was identified, how common the problem was, how damaging the problem was and what, if any, control measures were utilized. Scouting data sheets are available through various sources, including some that are crop- and pest-specific. Including a field map in scouting records is a simple way to show scouting patterns and the location of identified issues. Keeping good records will improve the effectiveness of future scouting activities.

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



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