

Chapter 21: Field Scouting Basics



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Field scouting provides information needed to make the “best” possible in-season crop management decision. Regular and planned field scouting provides information on pest pressure, crop injury, crop growth staging, and soil and plant nutrient conditions. Field scouting, along with good field records, provides a resource for future management plans. This chapter discusses the basics of field scouting for weed, insect, and disease management.

Introduction and background

Field scouting is a basic component of integrated pest management (IPM). Field scouting can be performed by 1) the grower, as a do-it-yourself option; 2) a field scout, or crop consultant, under contract; or 3) commercial ag-service personnel or agronomist. Developing a complete field history provides growers with information needed to minimize misdiagnosis and make the “best” decision possible. A “good” set of field records will include:

1. Specific field location (GPS information).
2. Crop data from the previous 1-3 years (variety information, pesticide applications) at a minimum.
3. Production year variety or hybrid.
4. Agronomic practices (planting date, planting rate, row width, tillage, timing of tillage or no-till).
5. Pesticide applications (rates, pesticide name, application dates, seed treatments).
6. Weather patterns.
7. Fertility application information.
8. Soil test results.
9. Soil type.
10. Pest information.

The right equipment helps to make the scouting job much easier. A good scouting report form and a clipboard are used to record the collected data. Other useful items are listed below (Table 21.1) as well as in the “Rules of Thumb for Scouting.”

Table 21.1. List of helpful items for the field scout.

1. Bucket	10. Sharp pocket knife or single-edged razor blade
2. A good sweep net (15” opening)	11. Clear plastic zip-lock type bags or screw-top vials
3. Drop (beat) cloth (2 ft long)	12. Alcohol
4. Hand lens - 10X	13. Forceps or tweezers
5. Measuring wheel	14. Travel or hand spade
6. Sampling square	15. Shovel
7. Tape measure or yard stick	16. Soil sampler
8. Field flags	17. Paper bags
9. GPS	

Scouting frequency will vary according to crop, crop stage and pest severity. In general, scouting should be done weekly during the growing season. When pest infestations approach economic levels or when weather conditions favor rapid development of specific pests, daily monitoring is recommended.

The number of samples for a field is dependent on the specific pest and other factors, which are noted in the “Rules of Thumb for Scouting.” Refer to information on the pest for economic thresholds and specific scouting patterns.

Rules of Thumb for Scouting

- Sample 5 locations within an area with a maximum size of 40–60 acres, sample “like with like.”
- Follow standard protocols when collecting information.
- Scouts need to be familiar with the growth and maturity stages of the crop (Chapter 3).
- To determine the wheat growth stage, scouts should collect a random sample of 10 plants around each sampling point (Fig. 21.1, 21.2, and 21.3).
- Scouts need to be familiar with the pest life cycle.
- Archive information for later assessments.

Landscape characteristics and information from field history should also be considered in the process of identifying sampling areas. If the field was in two different crops last year and one crop during the current year, it should be subdivided according to last year’s crop areas. The number of scouting stops needs to be representative of the field, and specific sampling units will vary according to the pest spatial and temporal variability.

Sampling methods need to be set up according to the pest and the crop. Sampling options could include swings of a sweep net for a specific area, insects on a drop or beat cloth, insects on leaf or other specific plant parts, disease symptoms on plant tissue, and/or weeds per row length (100’), or some systematic measure of land area.

A common method for counting insects is using a sweep net. To use a sweep net, swing the net from side to side in a full 180-degree arc. Tilt the net opening so that the lower edge of the rim is slightly ahead of the upper rim to catch insects as they fall from the plants. Sampling data is generally reported as average number of insects per sweep.

Some insects are easier to count if they are dislodged from the plants by shaking and allowing the insects to fall into a bucket or onto a white drop cloth or beat cloth. This works well, especially for insects that have coloration that blends in with the crop foliage. The cloth can be unrolled on the ground and placed between rows. Plants on both sides of the row are vigorously shaken to dislodge the insects. The same procedure can be done with a white bucket, and counts are documented as insects per plant.

The most common means of sampling (scouting) small grain plants in the field is through visual observation, which works well with many insects and diseases. Specific plants samples can be taken and visual observation of insect and insect stages can be used to predict pest severity and development. Plant nutrient symptoms can also be detected through observation, and plant samples can be taken for analysis. Refer to your pest information sources for specific sampling procedures and economic thresholds.

Scouting patterns in the field units will help to ensure that the sampling results are representative of the whole field. There are several possible data collection and observation patterns that can be used when scouting fields. These are based on various pest distribution patterns and field layout configurations. As with the sampling options, scouting patterns are specific to pests and soil fertility problems. The three most common field scouting patterns are described below.

Scouting patterns

Pattern I.

Use the W the pattern when scouting for pests that are uniformly distributed throughout the field (Fig. 21.1). The sampling sites should be evenly distributed across the field excluding obvious influencing factors such as field edges, hills, and low-lying areas. Common patterns typically look like an X, Y, W, or Z. Common pests that fit this pattern include wild oats, leaf diseases, aphids, and armyworm.

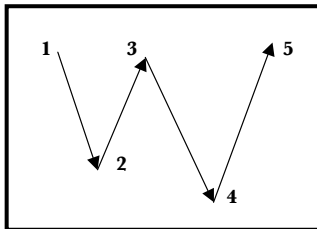


Figure 21.1. A W sampling pattern. Most appropriate for pest that are uniformly distributed across a field.

Pattern II.

This pattern is used to target pests that favor specific characteristics such as highlands, lowlands, excessively wet or dry areas, or areas high in organic matter (Fig. 21.2). The sampling should be concentrated in the likely areas. Some examples of pests that fit this pattern include quackgrass, root rots, and cutworms.

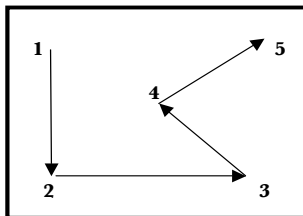


Figure 21.2. A targeted sampling protocol. Appropriate for pests that favor specific characteristics.

Pattern III.

This pattern is used when pests are at the edges of fields (Fig. 21.3). Sample for these pests by walking along the field edges, fence lines or ditches. Examples of pests that fit this pattern include grasshoppers, flea beetles, cheatgrass and Canada thistle.

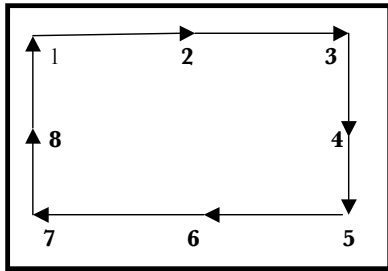


Figure 21.3. A sampling protocol designed to identify pest invasions from adjacent fields.

Other considerations

When scouting for insects, the objective is to identify the insects present in that field and determine which ones may become a problem. It is very important to determine the insect species and refer to local information on life cycles and economic thresholds so a decision on action can be made. It is helpful to be aware of the presence of any beneficial insects and to estimate if they are influencing the pest population. The beneficial insects may be able to keep the insect pests in check on their own. It is important to check fields at least weekly and more often if problem insect pest populations are building. Some insects can cause major damage in just a day or two.

Often fields can be scouted concurrently for insects, weeds, and diseases. When scouting for crop diseases, be aware of the disease symptoms, which are common to the area. Plant diseases in wheat can be influenced by weather, fertilizers, nutrient deficiencies, herbicides, and soil problems. In many cases, the cause of the symptom may not be obvious and may require samples to be taken to a diagnostic laboratory.

As with insects, disease scouting may require specific sampling techniques. Refer to your pest information source for specific problems.

The goal of weed scouting is to assess/monitor the infestation level in the field and to detect any new weeds. When new weeds show up, even at low levels, it should be noted so action can be taken to control or prevent them from becoming a concern. Many times early detection of a new weed problem will allow control strategies so as to prevent major problems later.

Scouting for weeds should begin early in the spring as new growth begins and continue until freeze-up in the fall. Weeds will compete with the crop for sunlight, space, moisture, and nutrients and, in sufficient numbers, may decrease the crop yields. A final scouting in the fall before snow cover will identify existing winter annual weeds, which will be the first to emerge the next spring; these weeds can be very competitive with both winter and spring wheat.

Additional information and references

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