

BEST MANAGEMENT PRACTICES

CHAPTER 4



Importance of Using Field Records for Corn Management Recommendations

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Field records provide information needed to avoid future problems. Field records are created by combining your field-specific information into a single document. This chapter discusses what should be included in your field records and how to integrate this information into the decision process.

Importance and Federal Regulations

The time spent maintaining careful records can help to improve profits and overall efficiency of your enterprise. Records provide information needed to identify successes and failures, and they should be as detailed and complete as possible. Field record information may include field location, crop type, hybrid number, genetic enhancements, soil type(s), previous crops and yields, tillage, planting information, maps showing problem areas, soil test results, and any fertilizer/manure applications or pesticide applications. Scouting maps and the results of soil and manure tests should be attached or included in the records. If available, daily or monthly weather records should be attached to the yearly record.

Federal law requires that all private applicators keep records of applications of all restricted-use pesticides (RUP). These records must be kept for a minimum of 2 years. Restricted-use pesticides will be clearly labeled for “restricted use,” and they can be purchased or applied only by a certified applicator. Additional



Figure 4.1 Field records of current and prior pest populations can be used to assess current and future risks. This image shows a cornfield with very few pests.

information on pesticide and general field record keeping is available from the South Dakota Department of Agriculture, <http://sdda.sd.gov> or from local Extension educators.

Field Records

Corn production costs can exceed \$500/acre or \$80,000 for a quarter section. To ensure that these resources are well-invested, fields are routinely scouted to identify problems (Fig. 4.2). This information is compiled can be used as a benchmark for identifying successes and failures. Although rarely discussed in achieving high yields, we believe that maintaining accurate records is a critical step in optimizing yields. Field records should include information about field productivity, previous soil test information and fertilizers applied, historical information, and insect and weed pest management history.



Figure 4.2 Scouting a field.
(Courtesy of USDA-NRCS)

Field Productivity

Many decisions come down to the expected cost and return from each investment. An economic analysis can be based on a single or multiple years. A critical component when conducting an economic analysis is knowing your input costs and expected returns. Examples of these costs are available in Chapter 54. Input production costs are associated with the cost of the seed, fertilizer, herbicide, or insecticide, whereas the financial return is the expected yield times the selling price. Expected yields can be estimated from long-term field records. If long-term productivity information is not available, it may be possible to assess yield improvements using archived Landsat images or soil survey information. If the data suggests that yields have not increased, then the land may not have been managed properly. Yield data is a valuable tool for evaluating management strategies. Difference between the observed and expected yields can be used to identify problem areas.

Soil Fertilizers and Test Results

A periodic assessment of your corn soil fertility program will help determine whether you are applying the right fertilizer, at the right rate, at the right time, and at the right location. This assessment would reveal if changes in the soil nutrient levels had occurred. This assessment requires that historical soil test results and yields be available. Details on conducting this assessment are available in Chapter 29.

Historical Information

Historical information is a valuable source of information. When South Dakota was homesteaded, most quarter sections had a farmstead where livestock were maintained. Even though many of these homesteads were removed over 50 years ago, their location can still be located in soil nutrient maps (Fig. 4.3). Depending on prior management, the size of area with high nutrient concentration can be small or large. These areas should be sampled separately from the rest of the field. Old aerial photographs may be available in the local USDA-NRCS office.

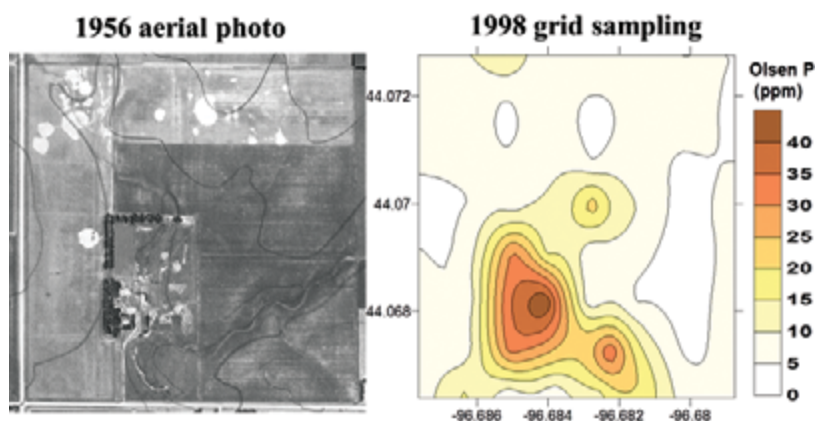


Figure 4.3 Influence of farmstead and feedlot on soil test P levels.
(Reitsma et al., 2012)

Pest Management History

Field records and record keeping are critical components of an integrated pest management program (IPM). Field pressure from weeds, plant diseases, nematodes, and insects is affected by tillage and crop management practices. Historically, tillage was used to bury the surface residues, which reduced disease pressures. Each of these pests is discussed throughout the manual.

Weeds

The weed-control management history provides a picture of previous and potential problems (Fig. 4.4). Past records of weeds and their associated control reveal information about what worked and what did not work. Weed records can also be used to identify herbicide resistance. Increasingly, chemical companies are reformulating old chemistry into “new” products. Therefore, record the trade name as well as the common name of the active ingredients and mode of action. To reduce the risk of developing pest resistance, avoid using compounds with similar modes of action.



Figure 4.4 Cornfield with high weed pressure.

Insects and Diseases

A complete history of each field should include any insect and disease infestations, and the effectiveness of the different control practices. Records of the crop rotation, tillage, planting dates, insect identification, insect scouting reports, and economic losses can be used to predict future risks. When assessing insects, scout the borders of your field. Many insects overwinter in plants found outside of the field boundaries. Keep records of insecticides used, including genetically modified organism (GMO) traits, for insect control. Refuge areas should be maintained or refuge-in-a-bag planted to reduce resistant insect populations. Volunteer corn in soybeans can increase corn rootworm problems in the following corn crop.

Conclusion

Detailed field records can provide a wide variety of valuable information. The use of yield monitors provides an opportunity to build a profile for every field. The gathering of field information and data from the past, present, and future is the basis of productivity and economic efficiency. Accurate, concise field records and data provide information to creatively minimize risks and maximize profits.

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A G R O W I N G I N V E S T M E N T

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