

A4137

# Grain Management Considerations

*in Low-Margin Years*

Producing grain in years when profit margins are low can be extremely challenging. When managing complicated agricultural production problems, we are tempted to find a silver bullet, a one-stop shop, a cure-all or just some good old luck!

*But we know better.*

The first thing to remember is to stay focused on the data you have in hand and systematically consider your inputs and goals. Some decisions can be made in the off-season (ex., variety/hybrid choice), while some can only be made in-season (ex., to spray an insecticide or not). Regardless of when decisions need to be made, it is important that those decisions are based on data\* and/or experience that has been proven to be profitable on your farm or on farms in a similar environment.

*Resist the temptation to buy an untested solution that promises to improve yield.*

What follows below and is expanded on in the following pages are considerations to help you make informed decisions about your production system in a low-margin production year.

\* replicated research data from a trusted source

<p><b>Start with recent soil tests</b> to make decisions on profitable soil fertility management.</p>	<p><b>Choose a variety or hybrid</b> that performs well in multi-location performance trials and optimize its management for your farm.</p>		<h2>PEST MANAGEMENT</h2>	
<p><b>Optimize seeding rates for your variety/hybrid.</b></p>	<p><b>CROPPING</b></p>	<p><b>Rotate crops.</b></p>		
<p><b>Use the technology that you already have.</b></p>		<p><b>Negotiate lower cash rent</b> based on yield history and price expectations, along with your own costs</p>		<p><b>Know your own cost of production</b> based on your input prices and rates, your machinery operations, your land rents and custom services.</p>
<p><b>ECONOMIC</b></p>				

# CROPPING

## Rotate crops.

Crop rotation can help manage residue without tillage. Fewer passes can save money!

**Choose a variety or hybrid** that performs well in multi-location performance trials and optimize its management for your farm.

- **Use trial data** and pick varieties or hybrids that not only perform well but also have the traits you are interested in (e.g. herbicide tolerance). See the *2016 Wisconsin Soybean Variety Performance Trials* and the *2016 Wisconsin Corn Hybrid Performance Trials* for individual variety/hybrid performance.
- **Plant multiple varieties or hybrids** to diversify plant genetics and lower risk of yield loss to unforeseen stress factors.
- **Pay attention to crop maturity ratings** and use varieties or hybrids that best match your production practices. Later maturing corn or soybean often produce greater yield, however frost damage or drying costs can offset higher yield potential.
- **Buy only the traits you need.** Most traits in corn or soybean are pest management traits, not yield traits. These traits protect yield, not enhance it.
- **If you are considering traits, like corn rootworm Bt traits, use scouting data from previous years to make the correct decision on type of trait.** Be sure to also identify disease resistance in varieties and hybrids you are interested in.
- **Choose the varieties or hybrids best suited for your area** that also have the best disease resistance rating you can find.
- **Plant early** to maximize yield.

## Optimize seeding rates for your variety/hybrid.

**For soybean**, the optimal seeding rate in ~80% of WI soils is 140,000-165,000 seeds per acre, with the intent to achieve a final stand of 100,000 plants per acre at harvest to maximize yields. In drought-stressed environments farmers should increase soybean seeding rate to achieve a final stand of 140,000 or more in the entire field or problematic areas of a field. The economic optimal seeding rate for soybean seed treated with full seed treatment package (fungicide + insecticide) is often ~20,000 less than non-treated seed.

**For corn**, the harvest plant density that produces the maximum yield on most soils in WI is between 35,000-38,000 harvested plants per acre. The economic optimum is 4,000-5,000 less per acre). You can be within 95% of the maximum yield and economic optimum by establishing 26,000-30,000 harvested plants per acre. However, these guidelines vary greatly by field and also interact with corn hybrid.

## Start with recent soil tests,

soil testing costs \$0.40 to \$1.00 per acre per year or roughly the value of a few pounds of fertilizer!

- **Maintain soil pH in an appropriate range for your crop rotation** to improve nutrient availability and enhances N fixation in legumes and N mineralization from soil organic matter. If soil pH is too low for the crops in your rotation, yield will be limited. Lime applications take 3-4 years to completely react with the soil and should be considered an intermediate term investment.
- **Base P and K applications on soil tests.** If a soil tests over optimum, reduce P and K fertilizer rates by half or eliminate and consider eliminating starter fertilizer. If both P and K test low and you can only afford to apply one, choose K. Recent UW research has demonstrated that K is more important for corn and soybean production than P.
- **Maximize profitability by using MRTN guidelines.** The maximum return to N (MRTN) guidelines along with realistic N:corn (or wheat) price ratios should be used to determine the N application rate.
- **Take manure credits and reduce fertilizer application rates.** In addition, forage legumes provide substantial N credits to corn in many situations.
- **Consider applying S for corn and alfalfa**, if you have had S deficiencies in the past or you have low organic matter, or sandy soils. When S is limiting, applications of 15-25 lb S/a in sulfate form are very profitable.
- **Micronutrients are often not deficient in Wisconsin.** Know which crops are sensitive to which micronutrients and know the soil conditions that are more likely to have low availability of micronutrients before you decide to make an application.
- **For all nutrient applications, follow 4R nutrient stewardship practices.** Use the right source, at the right rate, at the right time, and in the right place. This is critically important for N. Consider all aspects of your N management program to reduce potential N loss. For additional information, see UWEX Publication A2809, *Nutrient application guidelines for field, vegetable, and fruit crops in Wisconsin*.

# ECONOMIC

## Develop a marketing plan based on your costs and willingness to bear risk.

- **There is no right or wrong plan**, just having a plan (preferably written with dates and goals) is beneficial.
- **Estimate your production**, know your costs (direct and opportunity), and how crop insurance affects your marketing plan. This will help you project cash flow and estimate your farm income.
- **Use on-line grain marketing resources**, use the search phrase “develop a grain marketing plan.”

Also, contact your UW-Extension agent and other ag professionals, they may have suggestions for resources. Two examples are the UW Center for Dairy Profitability and University of Minnesota’s Center for Farm Financial Management, websites listed below.

<http://cdp.wisc.edu/agGrains/powerpoints/10-mktgplan.PPT>

<http://www.cffm.umn.edu/grainmarketing/marketingplans.aspx>

## Know your own cost of production based on your input prices and rates, machinery operations, land rents and custom services.

- **Calculate your costs for purchased inputs**, each input price multiplied by how much you have bought or plan to buy.  
Machinery costs are more difficult and have to be estimated. You can use custom rates as a starting point. Farmer costs tend to be higher than custom rates, especially if you run your machinery over fewer acres, since the fixed costs of owning the equipment are spread over fewer acres. Iowa State University Extension has a detailed process for those interested in an estimate for the specifics of their equipment and operation; search “estimating farm machinery costs.” Many UW-Extension county agents have budget templates in spreadsheet, as do many lenders. Pencil and paper work just fine.
- **Develop marketing plan and cash flow analysis.**  
You may want to split costs into direct costs that have to be paid (such as loan payments and rent payments) and opportunity costs (such as their time, depreciation and returns to owned land). Develop a marketing plan using forward contracts and/or futures contract and crop insurance to be able to make required payments for direct costs. Earning a fair return to your time and land may not always be possible under current markets and farm equity or outside income may be needed for family living expenses.

## Use the technology you already have.

- **Avoid steep learning curves.** When profit margins are low, it’s obvious that not spending money makes sense. Your time is also expensive; new technologies usually have a fairly steep learning curve and take time (and lots of mistakes) before you get proficient.
- **Utilize technology that you don’t have to own.** Check with your local cooperative for variable rate application equipment. If so, hiring them to make variable rate applications (VRA) may increase profitability given the right conditions. First, field variability should be mapped by collecting soil samples on a 1- to 2-acre grid basis. Second, at least 25% of a field should have a P, K, or lime recommendation that is different than the field average.
- **Use section control on sprayers.** Implementing section control allows the sprayer to turn off sections when they pass over an area that has already been sprayed. This reduces over-application, which reduces chemical usage and also reduces the risk of damage to plants. An added benefit of using section control is that environmentally sensitive areas within the field, such as grassed waterways and buffer strips, can be excluded from receiving the chemical application, thereby reducing runoff potential.
- **Automatic guidance systems can reduce costs in a number of ways.** Accurate pass-to-pass guidance reduces overlap and skips when spraying, maintains proper row spacing when planting, and minimizes the number of passes required to cover the field translating into fuel savings. Another added benefit is reduced operator fatigue, allowing the operator to stay in the machine longer and perform the operation at the optimal time. Also, the operator can focus attention on the implement to ensure that it is functioning properly. Having the ability to detect a clogged seeding tube or nozzle before misapplication has occurred over several acres saves time and money needed to correct the problem and/or reduction in yield in the fall.

**Negotiate lower cash rent** based on yield history and price expectations, along with your own costs.

**Convert from cash rent to flex lease.** Rent based on yield, price, or revenue, with or without a base payment. If you need help for negotiating a lease, perform an internet search using the phrase “flexible farm lease.”

**Copyright © 2017** by the Board of Regents of the University of Wisconsin System doing business as the division of Cooperative Extension of the University of Wisconsin-Extension. All rights reserved.

**Authors:** F.J. Arriaga is assistant professor in soil science; S.P. Conley is professor of soybean agronomy; B.M. Jensen is coordinator of integrated pest management program; C.A.M. Laboski is professor of soil fertility; J.G. Lauer is professor of corn agronomy, B.D. Luck is assistant professor of machinery systems; P.D. Mitchell is professor of cropping systems economics; D.L. Smith is assistant professor of plant pathology. All hold joint

# PEST MANAGEMENT

**Use integrated pest management (IPM)** tools and scouting to make educated decisions about cost effective management strategies for insects and diseases.

- **For insects**, use growing degree days to predict presence and best timing of controls.

**Base insecticide or fungicide applications on timely field scouting.** Informed spray decisions save money.

Rely on established, research-based economic thresholds to verify if treatment is needed. Do not adjust economic thresholds because insecticides or commodity prices have changed. This can result in more significant problems. Spraying at sub-economic soybean aphid populations will increase the potential for soybean aphid population resurgence and/or an increase in two-spotted spidermite damage.

- **For fungicides**, base decisions on known diseases previously observed in a field.

**For applications in Wisconsin corn**, data suggests that the best response occurs when the application is made near or immediately after tasseling. Scout prior to the tasseling (VT growth stage) and base decision to spray fungicide on the past field history, the foliar disease resistance rating of the hybrid, planting date and the amount of disease observed on lower leaves. If northern corn leaf blight severity (area of the lower leaves covered by disease lesions) is greater than 10% on 50% or more of the plants, fungicide could be effective in controlling foliar disease and a positive yield response observed. Spraying when no northern corn leaf blight is observed results in less than a 20% chance of recovering the cost of the fungicide and application. For some diseases like common rust, severity will rarely reach a point to cause yield loss in Wisconsin.

**For soybean**, white mold is the major disease of concern in Wisconsin.

Know the field history and perform any fungicide applications in at-risk fields **during** the early reproductive (R1-R3) growth stages. The weather (before and during R1-R3) will influence this decision. If weather has been wet (above average) and average temperatures mild (less than 80° F) then conditions will be conducive for white mold development. If weather has been dry and average temperatures above 80° F, spraying for white mold may not be needed. If weather is conducive, and you use the right product at the right time, return on investment will typically be positive in situations where white mold is a problem. For other diseases of soybean in Wisconsin, the odds of positive return when foliar fungicide is used will be less than 50%.

## Manage known weed resistance issues on your farm.

- **Preventing herbicide-resistant weeds is much less expensive than trying to control them!**
- **Use multiple modes of action (MoA) to reduce the risk of herbicide resistance** and manage weed populations that have developed resistance.
- **Knowing the field history and the predominant weed population in a field** will help you plan your weed management program.
- **Always use pre-emergence herbicide** as part of your weed management plan.
- **Select post-emergence herbicides based on weed population.** Scout the field prior to the post-emergence herbicide application **AND** two weeks after. Evaluate the size of weeds you want to target and ensure that the product you plan to use can control that weed at that stage. After two weeks, evaluate the control and to determine if any spots were missed. A second residual herbicide application may be justified based on field history.
- **Apply herbicides at the full labelled rate.** Half rates may save money but may not be as effective at controlling certain weed species!
- **Use generic herbicides when available** and adjuvants only if the label calls for it. Read the label carefully to adjust the rates according to the formulation.
- **Crop rotation helps manage weeds**, as it allows for many options for weed control rather than just a few.

---

appointments with the College of Agricultural and Life Sciences, University of Wisconsin—Madison and University of Wisconsin—Extension, Cooperative Extension. M.S. Broeske is senior editor and D. H. Smith is southwest regional specialist, nutrient and pest management program, the College of Agricultural and Life Sciences, University of Wisconsin—Madison. Cooperative Extension publications are subject to peer review.

University of Wisconsin—Extension, Cooperative Extension, in cooperation with the U.S. Department of Agriculture and Wisconsin counties, publishes this information to further the purpose of the May 8 and June 30, 1914, Acts of Congress. An EEO/AA employer, the University of Wisconsin—Extension, Cooperative Extension provides equal opportunities in employment and programming, Title VI, Title IX, and ADA requirements. If you need this information in an alternative format, or if you would like to submit a copyright request, please contact Cooperative Extension Publishing at 432 N. Lake St., Rm. 227, Madison, WI 53706, pubs@uwex.edu; or (608) 263-2770 (711 for Relay).

This publication is available from your county UW-Extension office ([www.uwex.edu/ces/cty](http://www.uwex.edu/ces/cty)) or from Cooperative Extension Publishing. To order, call toll-free 1-877-947-7827 or visit our website at [learningstore.uwex.edu](http://learningstore.uwex.edu).