Shawano Ag Newsletter

University of Wisconsin Cooperative Extension

April/May 2018

Shawano County

Shawano County UWEX
311 North Main Street
Shawano, WI 54166
(715) 526-6136

Website:
http://shawano.uwex.edu

Like us on Facebook at:
uwex.shawano.ag

Hours:
Monday - Friday
8:00 am - 4:30 pm

Don't forget to fill out the 2017 Census of Agriculture!

You can fill it out online at
https://www.agcounts.usda.gov/cawi?q=99.8132506243081

Waterhemp and Herbicide-Resistant Weed Management Videos

Waterhemp and herbicide-resistant weeds are becoming a bigger issue in Shawano County ag fields. You can find videos by Rodrigo Werle, UW-Extension Cropping Systems Weed Specialist, and Mark Renz, UW-Extension Weed Specialist, discussing tips for identifying and managing these yield-robbing threats on the University of Wisconsin Integrated Pest and Crop Management YouTube channel at https://www.youtube.com/user/uwipm/videos

Univ of Wisconsin Integrated Pest and Crop Management
3,506 subscribers

Integrated Approaches to White Mold Management

Damon Smith, UW-Extension Field Crop Pathologist, has created a new video, also available on the YouTube channel identified above, outlining a number of approaches to managing white mold in soybean.

Don't forget!!

2018 Outstanding Young Farmer & Friends of Shawano County Agriculture Awards Banquet

April 13th
The Main Event
6:45 social

Preregister with Shawano UWEX at (715) 526-6136

March 26, 2018 Hay Market Report

https://fyi.uwex.edu/forage/h-m-r/

Upper Midwest Hay Price Summary by Quality Grade

Hay Grade	*Bale type*	*Price ($/ton)*		
		Average	Minimum	Maximum
Prime (> 151 RFV/RFQ)	Small Square	$234.00	$165.00	$320.00
	Large Square	$186.00	$120.00	$250.00
	Large Round	$158.00	$135.00	$180.00
Grade 1 (125 to 150 RFV/RFQ)	Small Square	$182.00	$130.00	$280.00
	Large Square	$148.00	$75.00	$190.00
	Large Round	$123.00	$60.00	$160.00
Grade 2 (103 to 124 RFV/RFQ)	Small Square	$174.00	$105.00	$280.00
	Large Square	$121.00	$65.00	$150.00
	Large Round	$108.00	$50.00	$200.00
Grade 3 (87 to 102 RFV/RFQ)	Small Square	$110.00	$110.00	$110.00
	Large Square	$100.00	$70.00	$120.00
	Large Round	$109.00	$98.00	$120.00

University of Wisconsin-Extension

Dairy Situation and Outlook, March 20, 2018

By Bob Cropp, Professor Emeritus
University of Wisconsin Cooperative Extension
University of Wisconsin-Madison

March milk prices will end up higher than February. Butter and cheese prices will average higher in March, while both nonfat dry milk and dry whey prices remain low with no increase. Higher cheese prices will increase the Class III price to around $14.30 compared to $13.40 in February. Higher butter prices will increase the Class IV price to around $13.25 compared to $12.87 in February.

While stocks of dairy products remain relatively high improved domestic sales and dairy exports helped to strengthen prices. Compared to a year ago, January 31st stocks were: butter +1.0%, American cheese +2.2%, total cheese +7.0%, dry whey +28.6% and nonfat dry milk +50.0%. Domestic commercial disappearance of butter during January was up 6.3%, American cheese up 3.0% and other cheese varieties up 2.3% while beverage milk sales were 0.6% lower. Compared to January a year ago, exports of nonfat dry milk/skim milk powder were up 3%, cheese up 19%, total whey up 18%, but butter was down 6%. On a total solids basis January exports were equivalent to 13.9% of milk production compared to 13.1% a year ago.

Milk prices for the rest of the year will of courses continue to depend upon domestic sales, dairy exports and the level of milk production. With continued improvement in the economy domestic sales should be positive for milk prices. Dairy exports will continue to face stiff competition for markets mainly from the EU as their milk production continues to show strong growth. As far as other major exporters milk production is up just slightly in Australia but lower in New Zealand and Argentina. On the positive side U.S. dairy products remain very price competitive on the world market. U.S. prices of butter, cheese, nonfat dry milk/skim milk powder and dry whey are all lower than EU or Oceania prices. The world economy also is improving. So U.S. should see some growth in dairy exports during 2018.

So a key factor to where milk prices will be headed will be the level of milk production. Despite low milk prices milk production is not slowing down. Compared to a year ago, milk production was up 1.8% for both January and February. Milk cow numbers have increased each month since last October for a total increase of 15,000 head. February cow numbers were 45,000 head higher than a year ago for an increase of 0.5%. Slaughter dairy cow numbers are running about 3% higher than a year ago despite very unfavorable slaughter cow prices, but dairy replacements are at a level to grow the cow herd. Milk per cow was up 1.3%.

Of the 23 reporting states in February, 14 states had more cows than a year ago, 5 had the same number and 4 had fewer cows. Leading with increase in cow numbers were Texas with 16,000, Colorado with 12,000, and Idaho and New Mexico both with 9,000. States with the biggest decrease in cow numbers were California 17,000, and both Minnesota and Wisconsin with 5,000.

Biggest increases in February milk production over a year ago were: Colorado with 7.7%, Utah with 6.9%, Texas with 5.5%, and Idaho and Kansas both with 4.8%. Biggest decreases in milk production were Florida with 2.8% and New York with 2.3%. Despite California having 17,000 fewer cows 4.5% more milk per cow increased the state's milk production 3.5%. With fewer cows and just 0.5% more milk per cow Wisconsin's milk production was up just 0.1%. Fewer cows and just 0.6% more milk per cow resulted in a 0.5% decrease in Minnesota's milk production. Iowa had 1.8% more milk from more cows and higher milk per cow. A few more cows but less milk per cow netted South Dakota with no change in milk production.

Unless milk production slows down and/or dairy exports show greater increases it appears that milk prices will continue to slowly improve. Class III could improve to the $15's by July and possible top out near $16 by October and average for the year no higher than $15.00 compared to $16.17 last year. The Class IV price could improve to the $14's by July but remain below $15.00 and average no higher than $14.00 compared to $15.16 last year. But, hopefully, lower milk production and higher exports will push milk prices higher.

Robert Cropp
racropp@wisc.edu
University of Wisconsin-Madison.

UW Extension
University of Wisconsin-Extension

Farming for Profit

April 4, 2018

9:45 am to 3:00 pm

Romy's Holiday Inn, Kelly Lake

Are My Financial Concerns Short or Long-term Concerns?

~ Dan Kaufman, Financial Services Officer, GreenStone

Choosing the Right Farm Business Entity

~ Troy Schneider, Attorney, Twohig Reitbrock Schneider Halbach Law Offices

Crop Production: Maximizing ROI of Variable Inputs

~ Scott Reuss, UW-Extension Agriculture Agent, Marinette County

Finding the Balance: Cost of Production and Calf Health

~ Sarah Mills-Lloyd, UW-Extension Agriculture Agent, Oconto County

Generating an Operating Agreement

~ UW-Extension Agriculture Agents

Question and Answer Session

~ Dan Kaufman, Troy Schneider, Sarah Mills-Lloyd, and Scott Reuss

2018 Farming For Profit Meeting Registration

Name(s): _____

Company: _____ Telephone: _____

Address: _____ City/State/ZIP: _____

Email address (for a direct mailing in future years): _____

Registration: _____ People x **$25 per person** (includes meals & materials) = $_____

Total Enclosed: = $_____

Make Check Payable to: **UW-Extension**

Mail to: UW-Extension Oconto County
301 Washington Street
Oconto, WI 54153

Or call: 920.834.6845

Registration due Friday, March 30th

61st Annual

Outstanding Young Farmer & Friends of Shawano County

Agriculture Awards Banquet

Friday, April 13th

6:45 pm Social, 7:30 pm Dinner

The Main Event

(206 Lemke Street, Cecil)

$15 per person

Awards Presented:

ꕥ Outstanding Young Farmer ꕥ

ꕥ Friend of Agriculture ꕥ ꕥ Second Miler ꕥ

ꕥ Outstanding Tree Farmer ꕥ ꕥ Outstanding Conservation Farmer ꕥ

ꕥ Shawano County Farm Bureau Scholarships ꕥ

ꕥ Shawano County Forage Council Scholarship ꕥ

Please preregister by April 6th with:

Shawano County UW-Extension (715) 526-6136

For more information, contact
UW-Extension Ag Agent
Darrell McCauley
920-232-1970
darrell.mccauley@uwex.edu

Sponsored by UW-Extension Offices in the following counties:

Brown County
Calumet County
Door County
Fond du Lac County
Kewaunee County
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Marinette County
Oconto County
Outagamie County
Ozaukee County
Shawano County
Sheboygan County
Washington County
Waupaca County
Winnebago County

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Farm Management Update for Ag Professionals

Friday, May 4, 2018
9:00 am - 3:00 pm
Liberty Hall, Kimberly

800 Eisenhower Drive
Kimberly, Wisconsin
(920) 731-0164

UW Extension
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Farm Management Update for Ag Professionals

Friday, May 4, 2018
Liberty Hall, Kimberly

9:00 am	**Registration, milk, coffee, juice, and rolls**
9:30 am	**"Grain & Cattle Markets"** - *Brenda Boetel, Professor / Extension Marketing Specialist, UW-River Falls*
10:15 am	**"Mailbox Predictor Tool"** - *Brian Gould, Professor / Extension Dairy Market Specialist, UW-Madison*
11:00 am	**"UW-Extension Update—Rental Rates and Crop Budgets"** - *Stephanie Plaster, Ozaukee & Washington County & Darrell McCauley, Winnebago County UW-Extension Agriculture Educators*
11:40 am	**"Crop Update"** - *Kevin Jarek, Outagamie County UW-Extension Crops/Soils Educator*
12:00 pm	**Lunch**
12:45 pm	**"ICPA"** - *Sarah Mills-Lloyd, Oconto County & Tina Kohlman, Fond du Lac County UW-Extension Dairy/Livestock Educators*
1:30 pm	**"Resilient Farm Leadership: Train to Retain"** - *Stephanie Plaster, Ozaukee /Washington County UW-Extension Agriculture Educator*
2:10 pm	***"Robotic Investment / Labor Efficiency"*** - *Doug Reinemann, UW-Madison Professor / CALS Associate Dean and Biological Systems Engineering Extension Milking Systems Specialist*
2:30 pm	**"Speaker Q & A / Open Forum"** - *Moderated by Scott Gunderson, Manitowoc County UW-Extension Dairy/Livestock Educator*

UW Extension
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Farm Management Update for Ag Professionals Registration Form

Name(s): _____

_____

_____

_____

E-Mail(s): _____

_____

_____

_____

Business: _____

Address: _____

City: _____

Zip: _____

Phone: _____

Registration Fee: $40 per person

Make check payable to: **Waupaca County**

Mail this registration form and check to:

Waupaca County UW-Extension
811 Harding Street
Waupaca, WI 54981
715-258-6231

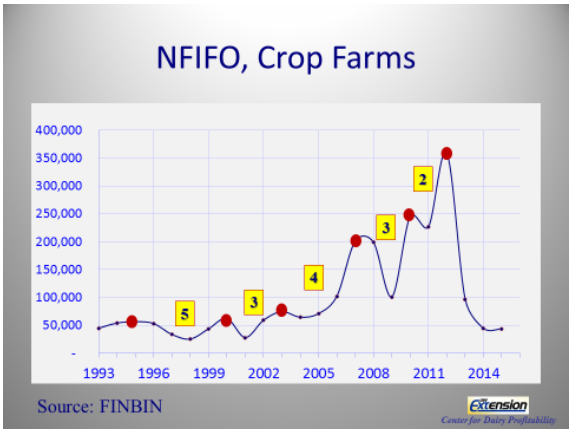
Registration Deadline: April 27, 2018

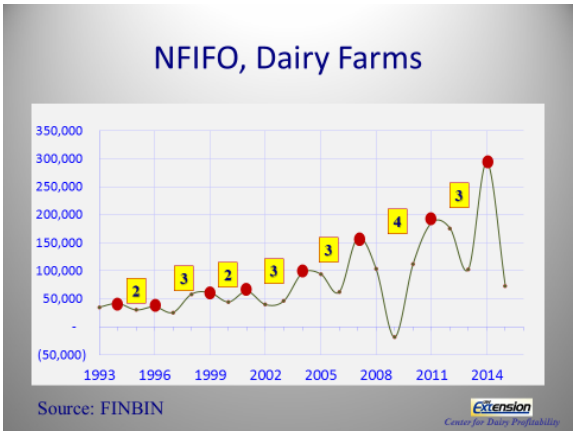
Managing at the Bottom of the Farm Income Cycle

February 2017, By Kevin Bernhardt

The Agriculture Income Cycle

Agriculture is a cyclical business. The two charts below show "Net Farm Income from Operations" (NFIFO) for crop and dairy farms from 1993 through 2015. There are large dots on high-income years of each cycle with the number of years shown between cycle highs.





As 2017 begins, agriculture is near the bottom for both commodities. Farmers are asking many questions on how to survive tight margins and what to do differently at the bottom of the income cycle. Strategically, the answer is the same. The same strategic business management[1] that strives and plans for low cost, high production, sound marketing, good risk management, and continuous sharpening of one's own saw[2] is the same at the bottom of the cycle as it is at the top. Further, accomplishing those strategies requires information, tools, and analysis that is the same whether at the top or bottom of the cycle including, but not limited to:

- Good and accurate records
- Using those records to analyze and inform management decisions
- Knowing costs of production
- Creating and following marketing plans that adapt to current situations
- Maintaining strong working capital
- Planning for profits through budgeting
- Tracking budgets for variances from plans
- Continuously "keeping up" on latest technologies, markets, and management practices

What does change, depending on where in the income cycle the world is at, is how tactically to implement farm management strategies. For example, the strategy of budget planning at the top of the cycle may tactically include pushing production to take advantage of prices and using profits to pay off non-productive debt, build a higher reservoir of working capital, and replace machinery. At the bottom of the cycle, budget planning tactics might shift focus to managing cash flow through cutting expenses, postponing capital asset purchases, and curtailing withdrawals.

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[1] Strategic management involves the formulation and implementation of major goals and initiatives to accomplish strategic objectives of the owners. Financial performance is an assumed strategic objective.

[2] Sharpening the saw is a term used in Stephen Covey's 7 Habits of Highly Successful People and refers to continuously learning and educating one's self to be better at their job or life.

Tactics for the Bottom of the Income Cycle

Use, Maintain, and Grow Working Capital.

Working Capital is what the farm has in cash or assets that can quickly convert to cash. There is a reason one builds their working capital during the high-income years and that is to have it as a risk management tool in low-income years. Even in the low-income part of the cycle, maintaining or building working capital is still a recommended strategy, but there are different tactics for accomplishing the strategy. Selling inventory, reducing farm withdrawals, new borrowing or restructuring debt, delaying capital asset purchases, and/or selling capital assets are tactics for periods of tight margins. How much working capital to have depends on the type of farm and other circumstances, but a rule-of-thumb is 30% or more of expected total revenues or expected total expenses. Fifty percent would be even better, but at minimum, a commodity farm business wants to maintain 10%-20%. Potential tactics include:

1. Sell Inventory.
   Selling inventory (grain, feeder pigs, etc.) is a normal part of farm operations. A tactic in low-income years is more aggressively sell inventory. This may mean sacrificing greater future income created by holding the inventory. Depending on the situation and the type of inventory, a manager may be able to use marketing tools to continue ownership while still generating cash through sales of the physical inventory. Another tactic is a short-term bridge loan that generates needed cash (loan proceeds), but allows taking advantage of more timely sales of inventory. The latter is much more palatable to the lender if the revenue stream is secured through price risk management tools.

2. Reducing Farm Withdrawals.
   While no one is eager to live more frugally, challenging profit margins call for belt-tightening. Family living and withdrawals for non-farm related reasons need assessing with short-term sacrifice in mind. The following tactic is new borrowing or loan restructuring, which is a more viable option to a lender if austerity measures on family living and withdrawals can be shown.

3. New Borrowing or Loan Restructuring.
   New borrowing to pay current bills, versus buying new capital assets, is a tough argument with a lender. The new capital asset will return future profits to pay the loan, but borrowing to cover current bills has no promise of future revenue. Nevertheless, it may be a short-term tactic to make it through times of tight margins. Loan restructuring may be a more agreeable option with your lender, especially for capital assets that do not depreciate – land. For example, a 10-year mortgage restructured to 20 years creates a lower payment each year and creates current cash flow. In addition, pulling out some equity may also be an option in the restructuring; however, remember that it puts an increased burden on future profits.

4. Selling Capital Assets.
   It is likely that many of the capital assets on the farm (tractors, cows, land, etc.) have equity in them and worth more than the borrowing against them. Therefore, selling them provides cash to pay the loan and provides working capital for current operations. However, the benefit of creating current cash comes at a cost. The cost may be tax consequences and the lost future income potential of that capital asset, the cow is no longer around to produce future milk and calves. Consideration should be given to the type of capital asset sold based on the income-generating ability of that asset.

5. Reduce Expenses.
   When profits are down and cash is scarce, reducing expenses seems obvious. This tactic works if the amount saved is greater than the income given up. The dairy farmer has many choices of what to feed their cows, but not all those choices ultimately save money because the value of production lost is greater than the cut in feed expenses. Former UW-Extension agent Ken Bolton stated “When does a

savings, in-fact, become a sacrifice." Mike Hutjens, University of Illinois, commented that you should never give up milk as even the last pound of relatively expensive feed likely has a positive return from the milk it produces. Therefore, while changing the quality of the feed may not be the best option, what is paid for feed or the land used to produce feed might be an area of cost savings. Renegotiating contracts, comparison-shopping, or bulk purchases may be ways of reducing expenses without reducing associated production potential. Even little cost reductions help. A reduction of $25 per acre on 200 acres is $5,000. That will not save the farm, but it helps pay some bills in tight times.

Marketing.

Marketing is a sound strategy in good and poor margin times. However, tactics and marketing goals may be different throughout the income cycle. Some marketing food-for-thought:

1. Marketing will not save the farm when margins are tight! Nor, will marketing promise the highest price when profits are good. A marketing goal to get the highest price is fraught with potential failure. However, a marketing goal to assure a future price, reduce the volatility of market prices, and give the manager greater ability to plan budgets, borrowing, and spending accordingly is very achievable.

2. Marketing is trying to shoot a deer in the dark with a blindfold on if costs of production are unknown. Costs of production give a benchmark for marketing and planning. David Kohl noted that if you do not know your costs of production then "you have failed one of the tests of business sustainability in tight times."

3. Leave upside price potential if cost effective. There is a trap in commodity marketing that when price is the lowest, the interest in marketing is the greatest, and the potential to secure a low price is also the greatest. It is a simplistic analysis, but when prices are low then there is strong precedent that future price movement will increase. If one markets in low price times to avoid the risk of even lower prices, then cost effective ways to leave upside price potential open should be considered (examples: PUT option, forward contract and buy a CALL option, etc.).

Tools You Can Use

Many analysis and decision-making tools are always good including during periods of tight margins.

1. Ratio Scorecard and DuPont Financial Analysis Tools.
   It sounds obvious, but a great way to avoid financial challenges is to be profitable. The Ratio Scorecard and DuPont financial analysis are diagnostic tools that can help the manager assess the status of profitability and determine areas of deficiency and/or opportunity. These tools can help the manager assess the strength of debt structure, repayment capacity, asset utilization, and efficiency. These tools require complete and accurate accrual adjusted income statements and balance sheets.

2. Budgeting and Variance Analysis.
   While saying it is easier than doing it, there is value in planning for profits then following the plan. Budgeting is a planning tool that allows the manager to plan for what they think will and/or want to happen. The "real" value in a budget is tracking it throughout the year and determining the difference, or variance, between plans and actuals. If done monthly, for example, then corrective actions can be made, including communication to the lender well in advance of potential shortfalls. Budgeting tools include enterprise, whole farm, and cash flow budgets. Cash Flow budgets are particularly important in periods of tight margins. The Cash Flow budget plans for incoming cash, outgoing cash, and borrowing needs.

3. Partial Budget.
   The Partial Budget is a budget-planning tool that allows the manager to evaluate potential changes (new ration, cow grouping, different tillage system, etc.). It is based on asking four questions:
   1. What new revenues will be generated if the change is made
   2. What current costs will be reduced/eliminated if the change is made
   3. What will the increase in costs be if the change is made
   4. What current revenue will be lost if the change is made

   One and two result in new/increased revenues, and three and four result in new/increased costs. Subtracting costs from revenues tells the manager if the change is profitable and by how much.

Summary

In periods of tight margins, the goal for some is survival, survival until better profitability. For many that will boil down to creating cash and paying bills with minimum sacrifice to long-term viability. A few tactics for doing so are listed here. There are, of course, many more. For example, Tom Kriegl's article, "Profitable Practices for Tough Times" (Extension Responds, July 20, 2012) provides a 17-point list. However, when the storm clouds pass and margins are more favorable, the sustainably profitable operations will get back to work preparing their operation to be resilient for the next downturn. There are many more options when margins are good to protect the farm business for the next downturn. Said another way, if we become a little too comfortable and laissez-faire at the top of the cycle, the bottom becomes much more challenging.

Resources:

- Cash Flow and Partial Budget Spreadsheet decision tools: contact Kevin Bernhardt at bernhark@uwplatt.edu, 608-342-6121.
- Bernhardt, Kevin. "Drought 2012: Partial Budget." July 19, 2012. http://fyi.uwex.edu/drought2012/2012/07/19/drought-2012-partial-budget/
- Bolton, Ken. "Dairy cow feeding economics or; 'When does a savings represent a sacrifice?'" July 9, 2010. http://fyi.uwex.edu/news/2010/07/09/dairy-cow-feeding-economics-or-%E2%80%9Cwhen-does-a-savings-represent-a-sacrifice%E2%80%9D/
- Heslip, Nicole. "Mike Hutjens Audio: Strategies for dairies in times of low prices," Brownfield Ag News for America, March 29, 2016, https://brownfieldagnews.com/managing-for_profit/strategies-dairies-times-low-prices/
- Kohl, David. "Strategies for handling tighter margins in agriculture," Corn and SB Digest, Aug 04, 2014, http://www.cornandsoybeandigest.com/blog/strategies-handling-tighter-margins-agriculture
- Kriegl, Tom. "Profitable Practices for Tough Times." July 20, 2012. http://fyi.uwex.edu/drought2012/2012/07/20/profitable-practices-for-tough-times/

Author contact: Kevin Bernhardt, bernhark@uwplatt.edu, 608-342-6121

Article reviewed by Dr. Nate Splett, Center for Dairy Profitability

UW Extension
University of Wisconsin-Extension

College of Agricultural & Life Sciences
UNIVERSITY OF WISCONSIN–MADISON

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

Start with recent soil tests to make decisions on profitable soil fertility management.

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

Optimize seeding rates for your variety/hybrid.

CROPPING

Rotate crops.

Use the technology that you already have.

ECONOMIC

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

PEST MANAGEMENT

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

Manage known weed resistance issues on your farm.

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

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

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.

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*.

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.

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.

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Grain Management Considerations in Low-Margin Years (A4137) I-01-2017

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."

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Focus on Forage

Wisconsin TEAM Forage

Evaluating and Managing Alfalfa Stands for Winter Injury

by **Dennis Cosgrove and Dan Undersander**

Introduction

Each year in Wisconsin, alfalfa stands are at risk of being injured or killed by winter conditions such as cold temperatures, ice sheets and heaving. Having the ability to evaluate this injury early in spring is helpful in making crop rotation decisions. This article will discuss factors affecting winter injury and "how to" methods to evaluate it.

How do plants prepare for winter?

Preparation for winter begins as days become shorter in late summer. Plants with a high level of fall dormancy will be shorter than those with less dormancy. Once nighttime temperatures drop below 40 ^{o}F, the plant begins the process of hardening or truly preparing for cold temperatures and the following changes occur to enable the plant to tolerate freezing temperatures:

- Cell membranes change to allow them to remain more fluid and so more functional at colder temperatures
- Sugars accumulate within the cells to lower cell freezing point. While this is sometimes cited as the primary mechanism for freezing tolerance, in fact this only lowers the freezing point 1 or 2 degrees.
- Compounds accumulate within the cell which absorb free water. Water in this state does not freeze and so cannot damage the cell
- Cells lose water. This is the most important way plant cells tolerate freezing temperatures. Water located in the cell walls, outside the cell, freezes. This does not damage cells but serves to "pull" even more water out of the cell. This water also freezes and the process continues until the cell is extremely dehydrated. This dehydration, coupled with absorption of free water in the cell (previous point), means there is very little water left to freeze and damage the cell.

What causes winter injury?

The processes described above allow alfalfa to tolerate temperatures as low as 5 to15 ^{o}F, depending on variety and past management. Below this temperature, water left within the cell freezes forming ice crystals that puncture the cell membrane. When cells thaw, they die as water and cell contents leak from the cells. Research has shown increased electrolyte leakage and cell rupture of alfalfa taproot cells exposed to 17.6 ^{o}F for as little as 30 minutes. Another way cells are killed is from the extreme dehydration they experience as more and more water is pulled from the cells. There are some varietal differences in dehydration tolerance.

Winter injury or death can occur from ice sheets that prevent air exchange to the alfalfa crowns. Toxic metabolites such as ethanol, methanol and lactic acid then accumulate which kill the alfalfa plant. Alfalfa can tolerate up to about 3 weeks of this before they are killed (less if soil temperatures are near freezing and longer if the soil is colder).

What factors affect winter injury?

A number of factors affect the likelihood of winter injury in alfalfa stands. Among them are:

- **Stand age.** Older stands are more likely to winterkill than younger ones.
- **Variety.** Varieties with superior winterhardiness ratings and a high disease resistance index are less likely to experience winter injury.
- **Soil pH.** Stands growing on soils with a pH above 6.6 are less likely to experience winter injury.
- **Soil fertility**. Stands with high fertility, particularly potassium, are less likely to experience winter injury than those with low fertility.
- **Soil moisture**. Alfalfa grown on well-drained soils is less prone to winter injury.
- **Fall soil moisture status**. As dehydration is the primary means of tolerating freezing temperatures, stands that go into winter with low soil moisture are better able to lose moisture and are less likely to winter kill.
- **Cutting management**. Both harvest frequency and timing of fall cutting affect alfalfa winterhardiness. The shorter the interval between cuttings, the greater is the risk of winter injury. Stands in which a last cutting is taken between September 1 and October 15 are at greater risk, as plants are unable to replenish root carbohydrate reserves before winter.
- **Snow cover.** Snow is an excellent insulator. The figure below shows soils temperatures under 0, 10 cm (4 inches), or 20 cm (8 inches) of snow. Temperature fluctuations are much less under snow cover. As little as 4 inches of snow can result in a 10o F difference in soil temperatures. Stands which have not been cut after

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September 1 or which have at least 6 inches of stubble left will be able to retain more snow cover and be less susceptible to winter injury.

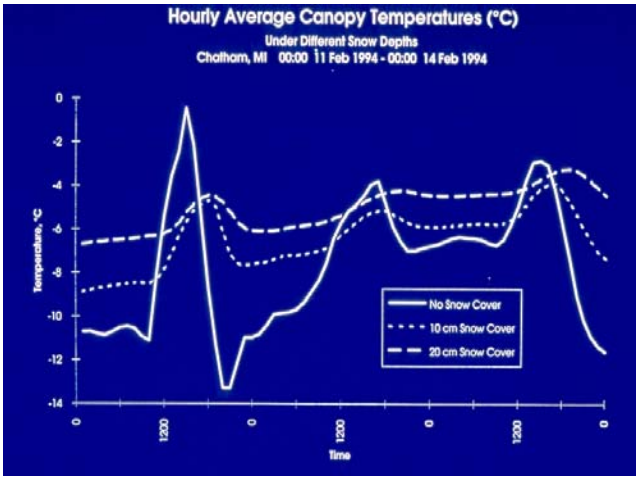


Figure 1. Effect of snow depth on soil temperature.

See Table 1 to evaluate an alfalfa stand's risk of winter injury.

How do I diagnose winter injury?

- **Slow Green Up**. One of the most evident results of winter injury is that stands are slow to green up. If other fields in the area are starting to grow and yours are still brown, it is time to check those stands for injury or death.
- **Asymmetrical Growth**. Buds for spring growth are formed during the previous fall. If parts of an alfalfa root are killed and others are not, only the living portion of the crown will give rise to new shoots resulting in a crown with shoots on only one side or asymmetrical growth.
- **Uneven Growth**. During winter, some buds on a plant crown may be killed and others may not. The uninjured buds will start growth early while the killed buds must be replaced by new buds formed in spring. This will result in shoots of different height on the same plant, with the shoots from buds formed in spring several inches shorter than the shoots arising from fall buds.
- **Root Damage**. The best way to diagnose winter injury is by digging up plants (4 to 6 inches deep) and examining roots. Healthy roots should be firm and white in color with little evidence of root rot. Winter killed roots will have a gray, water-soaked appearance early, just after soils thaw. Once water leaves the root, the tissue will become brown, dehydrated and stringy (see Figure 2). If the root is soft and water can be easily squeezed from it, or is brown, dry and stringy, it is most likely winter killed. Also, if 50% or more of the root is blackened from root rot, the plant will most likely die during spring green up or later in the year. See UW Extension Publication A3620 for more details on evaluating root health.

Figure 2. Frost injury to alfalfa taproot

My alfalfa stand is winter injured. Now what?

Winter injured stands required different management than healthy stands if they are to stay in production. If winter injury is evident consider the following:

- **Determine yield potential**. Potential yield of an alfalfa stand may be estimated by determining the number of stems in a square foot area. Once stem number is determined use the following formula to calculate yield potential of that stand:

  Yield (tons/acre) = (Stems/ft^2 x 0.1) + 0.38

  For example, an alfalfa stand with 50 stems/ft^2 would have a yield potential of 5.38. Remember, this is potential yield. Soil factors, nutrient deficiency, insects, diseases and many other things may affect the actual yield.

- **Use the following guidelines to aid in making a decision about keeping a winter injured stand:**

Using Stem Density to Evaluate Alfalfa Stands

Density (stems/ft^2)	Action
Over 55	Stem density not limiting yield
40-55	Stem density limiting yield potential
Under 40	Stem density severely limiting yield Consider replacing

- **Allow alfalfa plants to mature longer before cutting**. Allowing plants to mature to early, mid or even full bloom will help the plants restore needed carbohydrates for subsequent production. How long and during which cutting depends on the extent of winter injury. For severely injured stands, allow plants to go to nearly full bloom in first cut and to early flower in subsequent cuttings. This will give these stands the best chance at survival. Stands with less injury could be harvested somewhat earlier depending on the extent of the injury.

Stands with only mild injury could be allowed to go to 10 to 25% bloom at sometime during the season. It may be best to choose second or third cutting with these stands as first crop is usually the highest yielding.

- **Increase cutting height**. This is particularly important when allowing plants to flower before cutting. At this time, new shoots may be developing at the base of the plants. It is important to not remove these shoots as it will further weaken the plant to have to produce new ones.

- **Fertilize**. It is particularly important that winter injured stands have adequate fertility. Soil test and apply needed fertilizer prior to first cutting if possible.

- **Control Weeds.** Herbicide applications to control weed competition will help the stand by eliminating weeds that compete for moisture, light and nutrients.

- **No Late Fall Cutting**. Do not cut winter injured stands after Sept 1 to allow for the buildup of food reserves prior to winter unless the intent is to plow down the stand.

UW Extension — College of Agricultural & Life Sciences, University of Wisconsin-Madison

Table 1. Calculating Your Risk of Alfalfa Winter Injury

	Points	Score
1. What is your stand age?		
>3 years	4	
2-3 years	2	
< or = 1 year	1	
2. Describe your alfalfa variety:		
a. What is the winterhardiness (fall growth score)?		
Moderately winterhardy	3	
Winterhardy	2	
Very winterhardy	1	
a. total		
b. What is the disease resistance?		
Moderate resistance to only bacterial wilt	4	
Moderate resistance to bacterial wilt plus either anthracnose, Fusarium wilt, Phytophthora root rot, or Verticillium	3	
Moderate resistance to all mentioned diseases	1	
b. total		
Alfalfa variety total score (multiply a x b)		
3. What is your soil pH?		
< or = 6.0	4	
6.1 – 6.5	2	
> or = 6.6	0	
4. What is your soil exchangeable K level?		
Low (< or = 80 ppm)	4	
Medium (80 – 120 ppm)	3	
Optimum (120 – 160 ppm)	1	
High (> or = 160 ppm)	0	
5. What is your soil drainage?		
Poor (somewhat poorly drained)	3	
Medium (well to moderately drained)	2	
Excellent (sandy soils)	1	
6. What is your soil moisture during fall/winter?		
Wet	5	
Medium to dry	0	
7. Describe your harvest frequency:		
Cut interval / Last cutting		
<30 days, Sept.1-Oct. 15	5	
<30 days, After Oct. 15	4	
<30 days, Before Sept. 1	3	
or 30-35 days, Sept. 1-Oct. 15	4	
30-35 days, After Oct. 15	2	
30-35 days, Before Sept. 1	0	
or >35 days, Sept. 1-Oct. 15	2	
>35 days, After Oct. 15	0	
>35 days, Before Sept. 1	0	
8. For a October cut, 6 inches of stubble left?		
No	1	
Yes	0	
DETERMINE YOUR TOTAL SCORE (sum of points from questions 1-8)		

Adapted from C.S. Schaeffer, University of Minnesota, 1990

Fall Cutting Risk

If you score:	Your risk is:
3 - 7	Low / below average
8 - 16	Moderate / average
17 - 27	High / above average
28 or more	Very high / dangerous

Cool Bean Advisor

UNIVERSITY OF WISCONSIN AGRONOMY, SOYBEAN RESEARCH, UNIVERSITY OF WISCONSIN-EXTENSION

Wheat Stand Assessment, Winterkill Yield loss, and Nitrogen Application

Shawn P. Conley and John Gaska

Most winterkill that growers experienced in 2008 was related to prolonged ice sheets that limited plant respiration and ultimately lead to plant death. In 2009, Wisconsin wheat growers are again dealing with winterkill; however the culprit this year appears to be death by exposure (lack of snow cover). As you drive around the countryside and survey the wheat crop, distinct patterns begin to emerge. In general the wheat that is nearest the tree lines and held the snow the longest appears to be in the best shape, whereas those areas that were most exposed to cold, driving winds appear to be in the toughest condition. We also see a dramatic impact of planting date (early wheat looks better than late planted) and variety on winterkill (Image 1).

Many growers have been slow to pull the trigger on nitrogen applications due to the slow green-up we have experienced, however the warm weather forecast for this weekend should make winterkill decisions and N recommendations much easier as we progress into next week. As you scout, remember brown, dried leaves evident in some fields do not necessarily indicate winter injury, and green leaves are not a sure sign that the crop has survived either. (Image 2) The only way to properly assess the condition of individual plants is to examine the crown for the development of new white roots. If the crown appears white and healthy, and new roots are developing, the plant is probably in good condition.

Image 1. Planting date and variety impact on winterkill.

Image 2. Brown leaves don't necessarily mean wheat has not survived.

A valuable point to remember this spring is that in wheat, nitrogen serves two important functions. Nitrogen fertilizer may be used to manipulate the population (increase tiller number) as well as supply the nutritional needs of the crop to produce protein (Maowski et al. 1999; Soon and Clayton, 2002; Vaughan et al. 1990; Weisz et al. 2001). Therefore, wheat tiller number is an important indicator of

nitrogen application timing. Research indicates that if tiller (stem) number is greater than 70 per square foot, it may be beneficial to delay nitrogen application until just prior to jointing (Scharf et al., 1993). The advantage of a delayed nitrogen application is an increase in nitrogen use efficiency and a potential yield increase, however if tiller number is less than 70 per square foot, it is recommended to apply nitrogen at green-up in order to increase the effective plant population.

Nitrogen is a key component to producing good wheat yields; however, applying too much N fertilizer can have detrimental effects on yield. Excessive N fertilization encourages excess vegetative growth, which increases the possibility of lodging, making harvest more difficult and also increases disease potential due to a dense canopy. With the current high price of N fertilizer and very good wheat prices, some growers are wondering if 70 lb N/a for soil with 2.0 to 9.9% organic matter is still valid (Laboski et al., 2008). To answer this question, data collected over the past 12 years in southern Wisconsin was re-evaluated using current wheat and N fertilizer prices following the maximum return to N (MRTN) approach we use for corn N recommendations. The amount of N needed for wheat is strongly related to preplant soil nitrate levels (PPNT). PPNT for wheat is determined on 0-1' and 1-2' soil samples taken in late summer prior to planting wheat in the fall. If the PPNT is < 50 lb NO_3-N/a, then the MRTN rate is 70 lb N/a (with a profitable range of 65 to 80 lb N/a) which matches our recommendations for soils with 2 to 9.9% organic matter. If the PPNT is between 50 and 100 lb NO_3-N/a, then the MRTN rate is 45 lb N/a. And if the PPNT is > 100 lb NO_3-N/a, then the MRTN is 0 lb N/a (no N is needed). In these studies, if wheat followed soybean, then the MRTN rate was about 20 lb/a less. If PPNT soil samples were not collected last year, then it would be appropriate to use 70 lb N/a on soils with 2.0-9.9%. Also remember to take any N credits for manure applications or forage legumes if appropriate.

Nitrogen applications to wheat should be made in early spring at Feekes GS3 to GS5 (green-up to pre-joint). Applying N on slightly frozen ground in mid to late April in southern WI minimizes wheel traffic problems and meets the early season N needs of wheat, however off-site movement of N can occur.

Spring N management decisions are often difficult for growers when winter wheat stands are thin at green-up. The common questions are:

- What will this stand yield?
- How much N should I invest into this poor looking wheat stand?
- And finally, should I even keep this crop?

A good assessment of live plants is an essential first step. We recommend a minimum of 12-15 live plants per sq ft as a cutoff. It will usually not be economical to keep a wheat crop with less plant density than this. Use Table 1 as a guide when counting plants in various row widths. When counting, be sure to distinguish between whole plants and tillers. These recommendations are for plants per square foot. Whole fields do not have to be abandoned if one area is low in stand. Before you tear up a poor stand of wheat, be sure to calculate the input costs you have in the existing wheat crop, the costs of establishing another crop in relation to the expected yields of either crop, and lastly, current crop prices. Net profits from wheat are competitive with soybean and corn when you add in the return for the straw and the rotation benefits.

Table 1. Wisconsin Winter Wheat - Spring Plant Stand Recommendations

Minimum spring stands Good spring stands Excellent spring stands				
		Row Width (inches)		
Plants/acre		6	7	7.5
million	plants/sq ft	Plants per foot of row		
0.3	7	3	4	4
0.4	9	5	5	6
0.5	11	6	7	7
0.6	14	7	8	9
0.7	16	8	9	10
0.8	18	9	11	11
0.9	21	10	12	13
1.0	23	11	13	14
1.1	25	13	15	16
1.2	28	14	16	17
1.3	30	15	17	19
1.4	32	16	19	20
1.5	34	17	20	22
1.6	37	18	21	23
1.7	39	20	23	24
1.8	41	21	24	26
1.9	44	22	25	27
2.0	46	23	27	29
2.1	48	24	28	30
2.2	51	25	29	32
2.3	53	26	31	33

In 2008, we initiated a set of experiments to further quantify the impact of winter kill on grain yield and nitrogen needs for Wisconsin growers (Figures 1 and 2). Preliminary data suggests that at our Arlington site, 60 pounds of nitrogen was optimal for maximum yield regardless of the percent winterkill, whereas at Chilton a yield response to nitrogen was noted in some of our winterkill treatments. The value of this response is directly related to the cost of N applied. This research is being funded by the Wisconsin Fertilizer Research Program in 2009 and 2010.

Figure 1. Effect of Winterkill and Spring Nitrogen Rate on Soft Red Winter Wheat Yield at Arlington, WI in 2008.

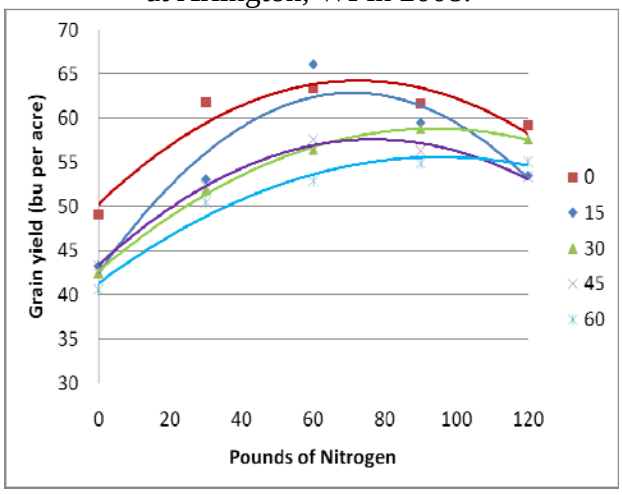
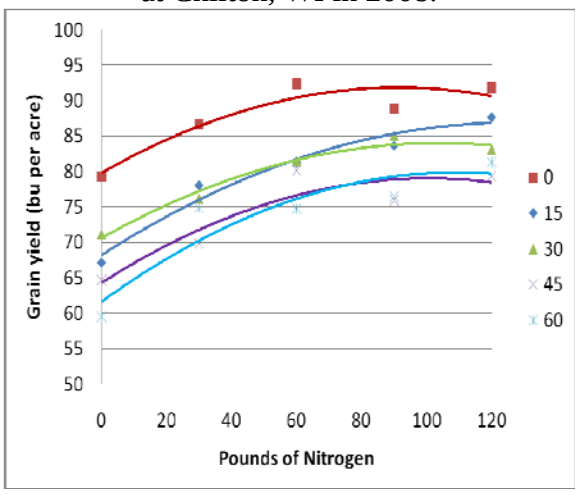


Figure 2. Effect of Winterkill and Spring Nitrogen Rate on Soft Red Winter Wheat Yield at Chilton, WI in 2008.



Heifer Management Blueprints

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Building a Better Breeding Criteria for Dairy Heifers

Introduction

The use of artificial insemination (AI) in dairy cattle has brought about changes to the dairy industry in a variety of areas, including the criteria for first breeding of heifers. Historically, before the introduction of AI, the timing of first breeding was primarily determined by the age of the heifer, possibly to ensure that the heifer was mature enough to withstand the weight of a dairy bull. As AI started to become a common practice, the idea of breeding by body weight (BW) surfaced in the 1960-70s, with the ideal BW being considered 875 lbs. for Holstein heifers. Breeding dairy heifers by body weight was considered superior to breeding by age as it was designed to avoid late breeding of heifers, which has been linked to excessive rearing cost. Today with well-managed heifer operations, however, the use of BW as sole breeding criteria for individual dairy heifers has some limitations. This article will discuss issues associated with breeding modern, well-managed dairy heifers by BW and propose an alternative method of deciding when to breed a heifer for the first time.

Some disadvantages of breeding dairy heifers by body weight alone

When breeding heifers, there are actual disadvantages of using body weight as sole breeding criteria. One concern involves normal genetic variance of body weight within a breed. Large framed, well-fed heifers will reach breeding weight at an accelerated rate as compared to smaller framed or less well-fed heifers. To help to counteract this issue, it has been suggested to breed heifers at 60% of their mature body weight although this solution is post-facto and challenging to employ at a practical level.

Another issue with breeding dairy heifers by body weight alone is the simple issue of getting an accurate body weight. Both the use of scales and heart girth tape has some error associated with their estimates depending on gut fill as well as human error. The inaccuracy and labor intensity of obtaining heifer body weights makes it somewhat arbitrary that heifers are actually bred at their "ideal" body weight.

There is also concern associated with determining heifer body weight on dairy heifers on an individual basis. Weighing dairy heifers individually, repeatedly until they reach the appropriate weight requires an immense amount of time and labor and is mostly impractical.

Building better dairy heifer breeding criteria

Information from recent experiments at the University of Wisconsin have demonstrated the potential for building better, more practical breeding criteria for dairy heifers. Some simple key concepts are required. First, when dairy producers and or consulting staff are evaluating the body size of dairy heifers it is important to understand these (12-13 month) body weights are not absolutely related to calving body weight. This effect can be observed in Figure 1.

The reasons 12-13 month body weights are not perfectly related to calving body weight (Figure 1) have been previously discussed, but include genetic variation of body weight, compensatory growth patterns, and, most importantly when breeding dairy heifers AI, uncertainty when the heifers will actually become pregnant. While challenging, dairy producers and their consulting staffs have to become accustomed to this variance. In short, looking at the size of a dairy heifer at 12-13 months of age is not that informative of "how big she'll be" at calving.

What is important in regard to body weight at first calving is AI reproductive efficiency. The body weight of a heifer at conception is more influential on body weight at calving and is represented in Figure 2.

Figure 1

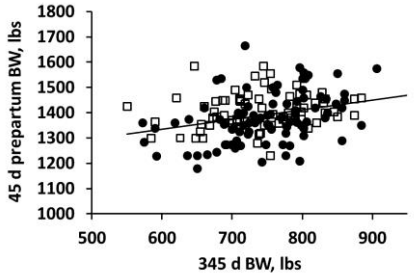
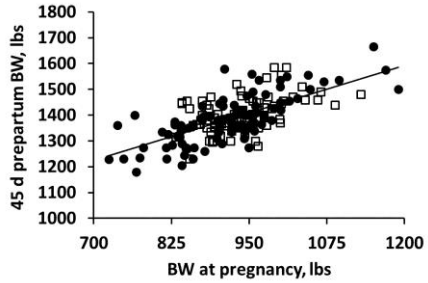


Figure 2



Adding age back to dairy heifer breeding criteria

Because body weight of dairy heifers at 12-13 months of age is not a perfect predictor of body weight at calving, screening dairy heifers for adequate body weight pre-breeding and breeding dairy heifers by age thereafter is an alternative heifer breeding criteria. This breeding criterion was explored in a recent experiment at the University of Wisconsin-Madison. In this experiment Holstein heifers were assigned to be bred individually by body weight or screened for general body size at 12 months of age and bred by age thereafter. Heifers assigned to be bred by age were eligible to be bred on the first observed heat after 13 months of age. Heifers assigned to be bred by body weight were weighed and bred at 850 lbs. All heifers were bred using visual heat detection and artificial insemination. Breeding heifers by age as compared to body weight had no effect on services per conception, conception body weight, or gestation length. Heifers bred by age tended to conceive at a younger (11 d) age as compared to heifers bred by body weight. Likewise, breeding heifers by age had no effect on body weight at 45 d pre-calving with age bred heifers averaging 1380 lbs as compared to 1400 lbs for heifers bred by body weight. Breeding heifers by age resulted in slight younger ages at first calving (23.7 vs. 24.1 mo.) as compared to heifers bred by body weight. No differences milk, fat or protein yield and milk fat or protein concentrations were observed between first lactation cows bred by age or body weight as heifers. The conclusions of the study revealed as long as pre-breeding heifer growth was adequate it made little difference if heifers were bred by body weight or age thereafter.

Reasons for using dual criteria to breed dairy heifers

Breeding dairy heifers by body weight is a sound management practice but in terms of practicality for producers especially of large herds it is challenging to truly implement. Body weight is still an important consideration to ensure the optimum future milk production and to minimize dystocia. However, a simple combination of pre-screening (12 mo) Holstein heifers for adequate body weight (850-900 lbs) and breeding by age criteria can also be implemented with success. At about 12 months of age, a group of heifers should be evaluated as a pre-screening for being bred in a month. If the heifers in the group are generally about 850 lbs. at the time of the pre-screening, the heifers can then be bred as a group at their first observed estrus following 13 months. If most heifers are lighter than this, heifer management should be evaluated and corrected so that subsequent groups of heifers are averaging in the desirable weight range at pre-screening.

Conclusion

Although BW is an important consideration for breeding heifers, truly implementing the practice is challenging. In well-managed dairy heifers, using body weight as the sole criteria for breeding heifers appears to be no more effective than a simple age breeding criteria. Using a dual body and age breeding criteria removes the impetus of weighing heifers on a regular basis. A combination of both BW and age criteria can be utilized to determine the time of first breeding. This method combines the safety net of assuring adequate body size prior to the breeding period with the ease and precision of an age criteria.

Wisconsin Department of Agriculture, Trade, and Consumer Protection
2811 Agriculture Dr., Madison, WI 53718 1-800-789-9277 www.nass.usda.gov/wi

WISCONSIN
CUSTOM RATE GUIDE 2017

MARCH 2018

GENERAL:

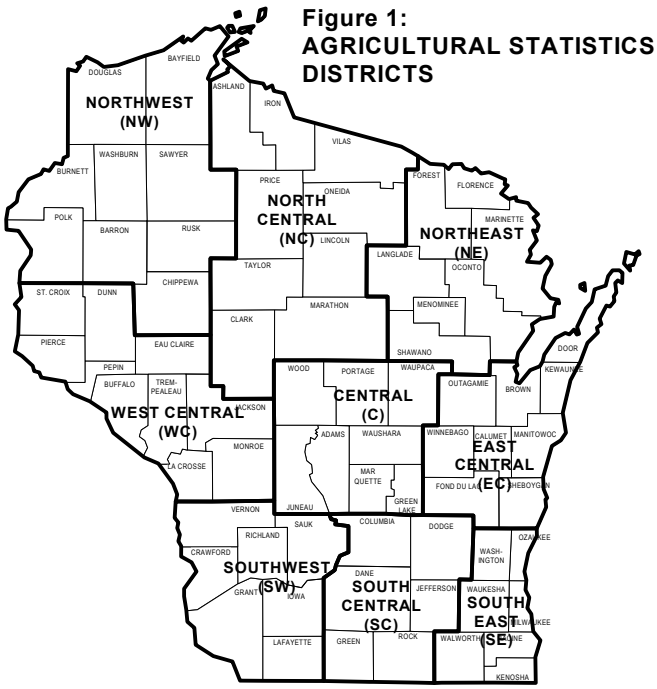
The 2017 Wisconsin Custom Rate Guide was compiled by the USDA's National Agricultural Statistics Service (NASS), Wisconsin Field Office, in cooperation with the Wisconsin Department of Agriculture, Trade, and Consumer Protection, the University of Wisconsin-Extension, and the College of Agricultural & Life Sciences, University of Wisconsin-Madison.

This summary is the result of a mail survey which collected rates paid by farmers for custom work performed in 2017. The figures are based on reports by farmers who hired custom work, custom operators and farmers who performed custom work, and machinery dealers who rented out equipment. There were 707 reports compiled.

Thank you to all survey participants who provided data for this publication! Your input made this report possible.

Most of the rates in this release include the cost of hiring a machine with fuel and operator, but exclude the cost of any materials. No attempt was made to distinguish between rates charged by custom operators who perform these operations as their main source of income and those who do custom work as a secondary source of income. This summary makes no effort to evaluate fairness of rates being charged.

Figure 1: AGRICULTURAL STATISTICS DISTRICTS

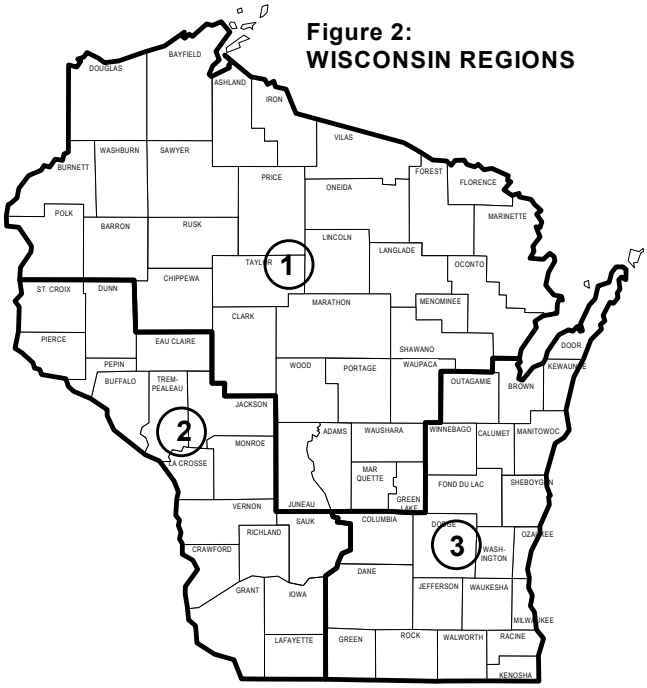


DATA:

Included in this release are statewide average rates and typical ranges for those averages. The rates and ranges in this release are based on actual reported data and should not be viewed as official estimates. The ranges provided for each custom operation encompass at least 90 percent of the reported values. Rates are typically influenced by fuel costs, soil conditions, topography, field size and shape, traditional practices in an area, and type, age, and availability of equipment. Reports were edited to remove items for which the respondent's figures were widely outside the range of other respondents' replies. Certain items may have appeared on the questionnaire, but were not summarized due to an insufficient number of responses.

Price changes for machinery, fuel, and labor should be taken into account when using this 2017 data for subsequent years.

Figure 2: WISCONSIN REGIONS



DISTRICT AND REGIONAL DATA:

Beyond statewide figures, averages at the regional or district level are included in this release where sufficient data was available. District breakdowns follow the nine Agricultural Statistics districts used routinely by NASS (see figure 1). For regional breakdowns, the Agricultural Statistics districts were grouped together based on similar geography and farming practices to form three regions (see figure 2). Please refer to these figures to determine which District or Region your operation falls in.

MANURE SERVICES, WISCONSIN, 2017

Operation	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
Cost Per Hour	Dollars/hour		Dollars/hour			Dollars/hour								
Solid Manure														
Loading	20.00-165.00	75.70	86.70	60.90	80.40	-	84.00	-	60.70	95.00	94.40	61.30	65.00	-
Spreading	10.00-200.00	96.40	134.00	81.50	88.60	-	143.00	-	93.10	-	90.90	58.30	93.30	-
Loading & Spreading	55.00-500.00	141.00	195.00	105.00	153.00	-	-	-	113.00	-	189.00	85.00	137.00	-
Liquid Manure														
Drag line pumping and spreading														
Surface	45.00-320.00	173.00	183.00	100.00	190.00	-	-	-	-	-	-	-	-	-
Injection	67.00-390.00	253.00	-	-	288.00	-	-	-	-	-	288.00	-	-	-
Tanker hauling and spreading														
Surface	23.00-300.00	108.00	116.00	105.00	101.00	88.70	121.00	-	94.60	135.00	97.20	114.20	125.00	-
Injection	80.00-240.00	153.00	-	-	165.00	-	-	-	-	-	-	-	-	-
Agitation boat	35.00-375.00	222.00	234.00	204.00	221.00	-	253.00	-	146.00	255.00	242.00	300.00	183.00	-
Manure tanker hauling only	65.00-185.00	105.00	130.80	96.70	97.90	-	136.00	-	87.50	123.80	96.70	97.80	-	-
Cost Per Gallon	Dollars/gallon		Dollars/gallon			Dollars/gallon								
Liquid Manure														
Drag line pumping and spreading														
Surface	0.001-0.061	0.012	0.012	0.009	0.014	-	0.010	-	0.009	0.016	0.014	-	-	-
Injection	0.001-0.025	0.010	0.009	0.010	0.012	-	0.008	-	0.010	0.011	0.010	-	0.016	-
Tanker hauling and spreading														
Surface	0.003-0.085	0.015	0.008	0.025	0.009	-	-	-	0.017	-	0.009	0.031	-	-
Injection	0.003-0.085	0.025	-	-	-	-	-	-	-	-	-	-	-	-

- Insufficient data

LAND TILLAGE OPERATIONS, WISCONSIN, 2017

Operation	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
	Dollars/acre		Dollars/acre			Dollars/acre								
Chisel plowing	6.00-35.00	17.60	18.10	15.90	18.20	17.70	15.60	19.10	15.80	20.60	19.80	16.00	16.30	18.00
Disk/ripper/ harrow combination	8.00-35.00	18.20	18.80	15.80	19.80	12.10	17.20	-	17.30	20.90	22.60	13.80	17.10	19.10
Field Cultivator	8.00-28.00	14.00	15.20	13.30	13.80	14.30	13.30	15.50	12.50	18.40	14.10	15.00	13.50	13.60
Moldboard plowing	7.50-35.00	19.30	18.70	17.00	21.10	15.60	17.70	22.30	17.00	17.30	23.20	17.00	17.90	17.10
Rotary hoe	5.00-13.00	8.40	7.40	8.50	8.70	-	-	-	8.55	-	7.85	8.40	9.10	-
Soil finisher	7.00-30.00	15.00	16.00	14.70	14.70	12.50	15.70	18.00	14.10	18.80	13.90	15.50	15.40	14.60
Strip tillage	12.00-37.00	19.10	22.60	18.60	17.60	23.50	-	-	19.30	-	17.50	-	16.50	-
Subsoiling	10.00-35.00	19.40	20.60	18.30	19.60	20.10	22.30	21.00	18.40	19.80	21.00	17.80	18.00	21.30
Vertical tillage	9.00-35.00	16.60	18.60	15.80	16.60	13.70	18.10	19.10	14.40	-	16.20	17.80	16.60	18.80
Finishing disk	7.00-34.00	15.60	16.50	15.50	15.10	10.70	-	15.70	16.60	22.00	15.30	14.20	15.00	14.30
Offset disk	10.00-36.00	19.70	22.30	14.50	19.90	-	-	-	-	23.80	19.80	-	19.90	-
Disk w/ digger & drag	5.00-34.00	15.30	18.50	14.00	14.30	-	-	-	-	-	16.00	-	13.70	-
Row cultivator:														
with fertilizer	8.50-28.00	16.20	17.00	-	15.80	-	-	19.00	-	-	14.20	-	17.00	-
without fertilizer	6.00-30.00	14.00	14.20	15.60	13.00	-	-	-	12.50	-	12.90	-	13.20	-

- Insufficient data.

PLANTING OPERATIONS, WISCONSIN, 2017

Operation	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
	Dollars/acre		Dollars/acre			Dollars/acre								
Corn														
Conventional Till														
Less than 30" Rows	10.00-46.00	21.30	22.20	21.70	20.40	22.80	22.50	21.00	21.80	-	21.60	21.30	19.10	18.80
30" rows and greater	5.00-35.00	18.60	18.60	19.30	18.10	18.50	18.10	19.10	20.40	18.80	18.80	17.70	17.20	18.60
Mulch Till														
Less than 30" Rows	10.00-40.00	21.90	19.60	22.30	23.60	20.00	-	-	23.50	-	25.30	-	-	-
30" rows and greater	10.00-32.00	19.70	18.60	20.50	19.90	19.20	-	-	21.70	-	21.00	18.20	18.90	-
No-Till														
Less than 30" Rows	10.00-40.00	21.20	20.90	22.30	20.60	21.80	19.90	21.70	22.00	-	23.80	23.20	19.70	17.90
30" rows and greater	10.00-35.00	20.20	21.20	20.20	19.90	20.90	20.90	21.70	21.20	22.00	20.90	18.90	19.00	22.10
Strip Tillage														
Less than 30" Rows	22.00-26.00	23.50	-	-	-	-	-	-	-	-	-	-	-	-
30" rows and greater	15.00-35.00	21.20	21.50	19.00	21.60	24.70	-	-	19.00	-	21.40	-	20.10	24.30
Soybeans														
Conventional Till														
Row	6.00-32.00	19.00	19.30	20.50	18.10	20.30	19.40	18.30	22.20	18.90	18.30	18.50	17.90	18.40
Drill	9.00-30.00	17.60	16.40	17.40	18.20	14.00	14.50	18.30	17.20	16.70	19.30	17.70	16.60	18.20
Mulch Till														
Row	10.00-30.00	18.80	18.20	18.40	19.50	18.10	-	-	18.20	-	21.00	18.60	18.70	-
Drill	10.00-30.00	18.30	18.10	18.80	18.30	16.50	-	19.70	19.20	-	20.10	18.30	16.30	-
No-Till														
Row	10.00-32.00	19.80	20.00	20.60	19.20	19.50	-	21.80	21.60	20.70	20.20	19.80	19.00	18.10
Drill	10.00-30.00	19.00	19.10	19.50	18.80	17.80	-	21.00	19.10	18.70	19.80	20.10	18.00	17.50
Strip Tillage														
Row	15.00-28.00	20.70	21.80	-	19.90	-	-	-	-	-	20.20	-	19.50	-
Small Grains														
Conventional Till	5.00-36.00	17.40	17.60	16.50	17.70	14.60	24.30	18.20	17.00	16.00	18.50	16.10	16.40	15.70
Mulch Till	4.00-30.00	17.80	13.80	15.60	19.90	-	-	-	-	-	21.50	-	18.00	-
No-Till	10.00-32.00	19.10	18.80	19.40	19.00	18.20	18.30	19.80	18.00	-	19.10	21.00	19.40	18.10
Alfalfa, Clover, etc.														
Conventional Till														
Drill	8.00-30.00	17.10	17.00	17.10	17.20	14.00	15.40	18.00	17.50	18.00	18.70	16.60	15.40	15.70
Airflow	7.00-20.00	12.20	11.10	-	14.00	-	-	-	-	-	-	-	-	-
Mulch Till														
Drill	10.00-30.00	18.20	18.40	16.90	19.30	-	-	-	18.90	-	20.80	14.80	16.30	-
No-Till														
Drill	4.00-30.00	19.00	17.90	19.00	19.40	16.30	15.80	20.50	18.90	18.00	20.50	19.20	18.20	-
Airflow	10.00-28.00	19.00	-	-	-	-	-	-	-	-	-	-	-	-

- Insufficient data.

FERTILIZER AND CHEMICAL APPLICATIONS, WISCONSIN, 2017[1]

Operation	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
	Dollars/acre		Dollars/acre			Dollars/acre								
Liquid Fertilizer														
Pull-type	4.00-18.00	9.80	9.65	10.10	9.75	8.15	10.00	-	9.10	-	10.70	11.20	8.85	9.25
Self propelled	5.50-16.00	9.10	10.30	8.75	8.90	9.40	10.00	-	8.90	-	9.15	8.50	9.00	7.80
Dry Fertilizer														
Pull-Type	1.50-15.00	6.30	6.65	5.95	6.24	6.65	7.15	-	5.65	6.10	6.15	6.50	6.60	5.75
Self propelled	3.00-15.00	6.65	6.80	6.60	6.60	8.60	6.15	6.95	7.40	4.80	6.65	5.20	6.70	6.15
Anhydrous Ammonia														
Pull-type	7.00-17.00	11.50	-	11.90	11.20	-	-	-	14.50	-	-	9.30	13.00	9.90
Self propelled	4.00-15..00	9.75	-	-	9.50	-	-	-	-	-	-	-	-	-
Spreading lime														
Pull-type	4.00-32.00	11.80	13.70	12.50	8.60	-	-	-	12.50	16.00	-	-	9.15	-
Self propelled	3.80-29.00	9.70	12.20	8.85	8.50	14.10	-	-	10.00	13.70	7.00	7.25	7.65	-
Spraying Pesticides[2]														
Pull-Type	1.00-16.00	8.00	7.40	8.00	8.35	9.35	7.10	8.15	7.75	6.15	8.65	8.50	7.95	8.50
Self propelled	6.00-20.00	8.70	9.00	9.05	8.36	9.40	9.10	8.70	9.40	8.45	8.45	8.60	8.25	8.30

- Insufficient data. [1]The prices listed reflect application only. Cost of materials is excluded. [2]Includes fungicides, herbicides, and insecticides.

HAYLAGE HARVEST OPERATIONS, WISCONSIN, 2017

Operation	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
Cost Per Acre	Dollars/acre		Dollars/acre			Dollars/acre								
Chopping only														
Pull-type	15.00-60.00	38.20	-	-	46.90	-	-	-	-	-	46.90	-	-	-
Self-propelled	10.30-160.00	30.70	27.80	63.80	18.30	-	-	28.30	80.00	-	18.10	-	-	-
Chopping, hauling, & packing bunker														
Self-propelled	23.30-65.00	49.20	48.70	-	41.30	-	-	-	-	-	41.30	-	-	-
Chopping, hauling, & filling upright silo														
Pull-type	15.00-60.00	41.30	-	-	35.00	-	-	-	-	-	35.00	-	-	-
Self-propelled	40.50-70.00	52.20	53.30	-	-	-	-	-	-	-	-	-	-	-
Cost Per Hour	Dollars/hour		Dollars/hour			Dollars/hour								
Chopping only														
Pull-type	100.00-175.00	133.00	127.00	142.00	-	-	-	-	-	-	-	-	-	-
Self-propelled	55.00-875.00	393.00	414.00	359.00	401.00	390.00	513.00	417.00	400.00	364.00	428.00	308.00	382.00	275.00
Chopping, hauling, & packing bunker														
Self-propelled	90.00-1150.00	683.00	682.00	717.00	658.00	-	-	-	828.00	-	607.00	-	-	-
Chopping, hauling, & filling upright silo														
Pull-type	75.00-225.00	128.00	-	-	-	-	-	-	-	-	-	-	-	-
Self-propelled	100.00-950.00	469.00	369.00	-	608.00	258.00	-	-	-	-	-	-	-	-
Filling and packing														
Bunker	45.00-520.00	136.00	163.00	127.00	120.00	113.00	182.00	210.00	125.00	183.00	128.00	130.00	105.00	-
Upright silo	40.00-350.00	216.00	205.00	258.00	-	-	-	-	-	-	-	258.00	-	-
Hauling only														
Truck	11.80-140.00	88.20	91.40	80.90	90.80	78.80	101.00	98.40	80.40	100.00	93.00	81.90	85.70	-
Wagon	20.00-125.00	82.90	81.40	76.80	87.80	-	-	81.00	79.40	73.30	85.00	70.00	90.60	-

- Insufficient data

HAY HARVEST OPERATIONS, WISCONSIN, 2017

Operation	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
Cost Per Acre	Dollars/acre		Dollars/acre			Dollars/acre								
Mowing and conditioning	5.00-50.00	14.20	14.20	14.10	14.20	13.50	14.40	14.20	14.20	14.90	14.10	14.00	14.30	14.20
Mowing only	7.00-32.00	14.20	14.60	13.40	14.30	12.30	-	-	-	-	15.10	14.00	12.70	-
Tedding	3.00-15.00	7.65	6.75	8.70	7.55	7.00	5.00	8.65	9.00	6.65	8.05	8.15	7.45	6.30
Raking	3.00-15.00	7.75	7.85	7.40	7.90	8.30	5.60	9.65	7.65	7.40	7.80	7.05	8.20	7.00
Windrow merging	3.00-40.00	11.60	11.20	10.20	12.20	8.30	12.60	12.60	10.90	13.20	13.00	8.50	10.40	-
Cost Per Hour	Dollars/hour		Dollars/hour			Dollars/hour								
Mowing and conditioning	50.00-384.00	162.00	170.00	138.00	179.00	170.00	152.00	-	144.00	189.00	235.00	123.00	126.00	207.00
Mowing only	45.00-285.00	130.00	91.30	178.00	141.00	-	-	-	-	107.00	-	-	155.00	-
Tedding	12.00-165.00	69.80	62.50	65.70	76.90	-	71.30	-	-	-	-	-	64.30	-
Raking	15.00-150.00	59.10	59.00	53.50	66.30	-	48.50	-	58.00	-	-	49.00	67.50	-
Windrow merging	18.00-300.00	151.00	136.00	150.00	165.00	140.00	158.00	153.00	164.00	92.00	175.00	129.00	133.00	-

- Insufficient data.

HAY BALING, WRAPPING, AND HAULING, WISCONSIN, 2017

Operation	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
	Dollars/bale		Dollars/bale			Dollars/bale								
Square bales														
25-50 lbs, Bale only	0.25-3.00	0.89	1.00	0.74	0.89	1.15	0.87	-	0.64	0.78	0.93	0.85	0.65	1.45
300-600 lbs, Bale only	1.00-15.00	7.65	-	7.75	7.45	-	-	-	-	-	7.50	-	7.35	-
600 lbs & over														
Bale only	5.00-17.00	9.15	9.35	9.45	8.95	9.25	9.45	9.05	10.00	9.70	9.15	8.75	8.60	9.15
Bale & Wrap														
Individual	5.00-19.00	13.10	-	13.00	12.70	-	-	-	9.00	-	12.50	15.00	12.90	-
Line	7.00-15.00	11.50	-	-	12.00	-	-	-	-	-	-	-	-	-
Wrap only														
Individual	1.50-10.50	7.35	4.85	8.35	7.50	-	-	-	7.25	-	-	9.20	7.65	-
Line	1.00-8.00	5.90	6.05	5.25	6.50	5.00	-	-	-	-	-	-	-	-
Round bales														
Under 1,000 lbs														
Bale only	5.00-35.00	9.05	8.30	9.00	9.70	8.65	7.95	8.80	8.75	8.25	8.35	9.15	9.55	13.90
Bale & Wrap														
Individual	3.00-16.00	9.85	12.00	9.65	7.50	-	-	-	9.25	-	-	10.20	6.50	-
Line	4.00-18.00	9.70	-	-	6.40	-	-	-	-	-	6.40	-	-	-
Wrap only														
Individual	1.50-8.00	6.30	5.65	-	-	-	-	-	-	-	-	-	-	-
Line	1.00-10.00	5.95	5.65	5.90	6.40	-	-	-	-	-	-	5.45	-	-
1,000 lbs & over														
Bale only	5.00-16.50	10.40	10.20	10.90	9.65	10.20	9.85	9.15	11.45	11.00	9.75	10.20	9.55	-
Bale & Wrap														
Individual	8.00-19.00	12.90	15.00	11.90	-	13.30	-	-	10.90	-	-	13.70	-	-
Line	6.00-20.00	13.70	14.70	13.40	13.50	-	-	-	14.60	-	-	11.50	-	-
Wrap only														
Individual	1.50-14.50	8.05	7.60	9.05	-	7.65	-	-	10.10	-	-	-	-	-
Line	1.00-12.00	6.20	6.40	6.25	5.85	-	-	-	8.10	-	-	4.85	5.90	-
	Dollars		Dollars			Dollars								
Hauling Hay Bales														
Cost/bale	0.50-10.00	3.40	4.15	3.75	2.15	-	4.35	1.75	6.65	4.00	-	2.45	3.60	2.20
Cost/hour	35.00-110.00	73.40	66.50	80.80	77.50	-	61.70	-	81.30	-	80.00	-	75.00	-
Cost/loaded mile	0.25-6.00	2.55	2.85	1.90	3.55	-	-	-	2.15	-	-	1.75	-	-

- Insufficient data.

CORN SILAGE HARVEST OPERATIONS, WISCONSIN, 2017

Operation	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
Cost Per Acre	Dollars/acre		Dollars/acre			Dollars/acre								
Chopping only														
Pull-type	12.00-130.00	44.60	-	41.30	47.50	-	-	-	-	-	54.60	41.30	-	-
Self-propelled	20.00-175.00	76.80	71.60	101.00	71.60	-	-	66.70	126.00	-	68.40	-	-	-
Chopping, hauling, & packing bunker														
Self-propelled	60.00-275.00	143.00	130.00	-	148.00	-	-	-	-	-	148.00	-	-	-
Chopping, hauling, & filling upright silo														
Pull-type	50.00-100.00	71.10	-	79.30	66.70	-	-	-	-	-	-	-	-	-
Self-propelled	12.90-250.00	130.00	112.00	-	147.00	-	-	-	-	-	-	-	-	-
Cost Per Hour	Dollars/hour		Dollars/hour			Dollars/hour								
Chopping only														
Pull-type	10.00-200.00	106.00	72.80	144.00	-	31.70	-	-	144.00	-	-	-	-	-
Self-propelled	55.00-1150.00	401.00	402.00	384.00	409.00	390.00	436.00	365.00	426.00	401.00	435.00	346.00	386.00	275.00
Chopping, hauling, & packing bunker														
Self-propelled	90.00-1450.00	675.00	681.00	645.00	697.00	198.00	-	-	739.00	-	763.00	550.00	700.00	-
Chopping, hauling, & filling upright silo														
Pull-type	75.00-250.00	133.00	-	175.00	-	-	-	-	175.00	-	-	-	-	-
Self-propelled	100.00-1000.00	494.00	342.00	-	663.00	226.00	-	-	-	-	-	-	-	-
Filling/packing only														
Bunker	40.00-630.00	128.00	154.00	112.00	121.00	111.00	161.00	210.00	118.00	183.00	128.00	98.60	102.00	-
Upright silo	20.00-350.00	169.00	146.00	258.00	-	-	-	-	-	-	-	258.00	-	-
Covering only														
Bunker/pile	10.00-500.00	157.00	-	-	91.70	-	-	-	-	-	91.70	-	-	-
Hauling only														
Truck	11.80-140.00	86.60	86.00	78.70	91.70	77.50	101.00	103.00	79.30	77.00	94.80	77.70	85.30	-
Wagon	10.00-125.00	82.10	80.60	72.30	90.00	-	81.30	81.00	79.40	74.00	90.60	61.00	90.00	-

- Insufficient data

SILAGE BAGGING[1], WISCONSIN, 2017 1/

Diameter	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
	Dollars/linear foot		Dollars/linear foot			Dollars/linear foot								
Cost of bag included														
8-foot bag	3.75-11.00	5.30	5.25	-	4.60	5.55	4.95	-	-	-	4.65	-	-	-
9-foot bag	1.00-12.00	5.35	5.30	4.90	5.55	6.20	4.40	-	6.15	5.05	6.30	3.60	4.00	-
10-foot bag	4.80-11.00	7.45	6.30	7.30	8.35	6.50	5.45	-	7.15	-	7.45	7.45	9.10	-
12-foot bag	8.00-12.00	9.20	-	-	10.40	-	-	-	-	-	-	-	-	-
14-foot bag	14.00-17.00	15.30	-	-	-	-	-	-	-	-	-	-	-	-
Cost of bag excluded														
8-foot bag	2.00-3.46	2.50	-	2.35	-	-	-	-	-	-	-	2.50	-	-
9-foot bag	1.25-5.85	3.25	4.10	3.00	3.95	3.65	-	-	3.30	-	3.05	2.90	-	-
10-foot bag	2.50-10.00	4.50	4.45	3.95	5.00	-	-	-	4.00	-	5.45	3.90	5.25	-
12-foot bag	5.00-13.50	7.90	-	6.90	8.00	-	-	-	-	-	8.00	-	-	-
14-foot bag	-	-	-	-	-	-	-	-	-	-	-	-	-	-

- Insufficient data [1]Prices exclude the cost of fuel and labor.

HARVESTING GRAIN AND CORN STALKS, WISCONSIN, 2017

Operation	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
Cost Per Acre	Dollars/acre		Dollars/acre			Dollars/acre								
Corn, grain														
Combining	8.00-60.00	32.60	32.40	32.50	32.70	32.70	31.60	34.90	33.80	30.50	33.90	30.60	31.60	32.50
Complete harvest[1]	25.10-75.00	43.70	46.00	41.50	44.20	44.30	50.60	54.20	42.30	37.70	47.30	40.70	40.80	44.40
Soybeans														
Combining	8.00-50.00	31.90	31.90	32.40	31.70	33.00	32.20	32.90	33.70	29.40	32.00	30.50	31.20	32.20
Complete harvest[1]	23.80-75.00	39.50	41.60	39.10	38.90	43.20	38.60	40.00	38.90	-	37.80	39.20	38.30	43.10
Small grains														
Combining	17.50-50.00	31.50	31.60	31.50	31.40	32.80	31.40	31.40	32.50	30.00	32.10	30.30	30.80	30.60
Swathing	7.50-36.00	15.20	11.90	16.50	21.70	10.80	11.60	-	16.60	-	22.40	-	-	-
Corn, stalks														
Harvesting/chopping for bedding, pull-type	5.00-40.00	13.20	14.30	13.70	12.00	-	-	-	15.00	-	-	12.50	11.30	-
Shredding	3.00-40.00	13.30	12.60	14.60	12.50	-	11.70	-	16.50	-	11.90	11.80	13.00	-
Cost Per Hour	Dollars/hour		Dollars/hour			Dollars/hour								
Corn, grain														
Combining	25.00-432.00	160.00	153.00	137.00	220.00	80.00	152.00	-	149.00	215.00	263.00	123.00	-	-
Complete harvest[1]	35.00-552.00	248.00	212.00	-	340.00	-	-	-	-	-	-	-	-	-
Soybeans														
Combining	25.00-680.00	195.00	210.00	156.00	229.00	-	227.00	-	198.00	246.00	285.00	105.00	187.00	-
Complete harvest[1]	99.00-680.00	266.00	260.00	-	-	-	-	-	280.00	-	-	-	-	-
Small grains														
Combining	30.00-420.00	146.00	160.00	116.00	169.00	96.70	157.00	-	112.00	228.00	213.00	119.00	144.00	-
	Dollars/bale		Dollars/bale			Dollars/bale								
Baling corn stalks	6.00-25.00	10.50	11.60	11.00	9.40	11.00	10.00	12.70	12.00	13.90	9.30	10.00	9.40	9.60
	Dollars/1 ton stack		Dollars/1 ton stack			Dollars/1 ton stack								
Stacking corn stalks	10.00-30.00	17.90	-	20.00	15.30	-	-	-	-	-	-	-	13.20	-

- Insufficient data. [1]Includes combining, grain cart, and hauling to storage.

GRAIN DRYING, STORAGE AND HAULING, WISCONSIN, 2017

Operation	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
	Dollars		Dollars			Dollars								
Grain Drying[1]														
Bin														
Cost/bushel	0.060-0.400	0.244	0.276	-	0.217	-	0.330	-	-	-	-	-	0.217	-
Cost/bushel/point	0.020-0.250	0.058	0.035	0.076	0.057	-	-	-	0.102	-	-	0.049	0.058	-
Continuous flow														
Cost/bushel	0.021-0.765	0.197	0.259	-	0.139	0.422	0.226	0.153	-	-	-	-	0.139	-
Cost/bushel/point	0.025-0.450	0.059	0.037	0.036	0.082	-	-	-	0.035	-	0.076	0.038	0.096	0.043
Grain Bin Rental[1]														
Cost/bushel/month	0.003-0.400	0.074	0.084	0.058	0.086	0.080	0.085	0.103	0.047	-	0.090	0.078	0.088	-
Hauling Grain														
Cost/bushel														
Field to farm	0.010-0.400	0.118	0.134	0.103	0.116	0.123	0.137	0.177	0.108	0.117	0.133	0.096	0.108	0.088
Farm to market	0.015-0.400	0.158	0.197	0.160	0.138	0.193	0.211	0.197	0.174	0.184	0.146	0.143	0.129	0.153

- Insufficient data. [1]Non-elevator.

MACHINERY RENTAL, WISCONSIN, 2017

Equipment	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
	Dollars/machine hour[1]		Dollars/machine hour[1]			Dollars/machine hour[1]								
Tractors														
2-wheel drive or front wheel assist														
Under 75 HP	10.00-75.00	27.80	27.10	29.50	26.40	25.00	-	-	25.00	33.30	23.30	34.60	22.00	-
75-120 HP	10.00-90.00	32.10	30.80	34.10	31.00	29.00	27.90	28.50	28.90	38.80	32.30	42.20	29.50	30.00
120-150 HP	20.00-110.00	40.70	44.60	40.70	37.60	50.00	-	46.50	34.90	42.30	38.80	52.40	31.70	-
Over 150 HP	18.50-150.00	49.40	46.50	50.70	50.50	40.80	39.80	56.70	46.10	52.00	51.50	62.30	41.40	64.40
4-wheel drive														
Under 175 HP	15.00-100.00	45.70	55.60	44.80	35.80	51.70	53.40	-	51.00	-	31.50	36.00	38.70	-
175 HP and over	20.00-200.00	63.20	67.70	64.80	60.10	65.00	66.10	70.00	68.70	69.00	62.70	53.50	53.30	-
Combines														
6-row and larger	24.00-350.00	112.00	95.60	83.90	141.00	-	-	95.00	71.70	-	163.00	91.20	126.70	124.00
Small grain head	29.00-300.00	117.00	105.00	85.40	147.00	-	-	-	-	-	193.00	111.00	-	-
Skid steer, capacity:														
under 2,000 lbs.	8.00-90.00	42.70	46.40	39.90	42.60	54.00	38.80	51.70	43.80	-	43.50	35.00	40.80	-
2,000 lbs. and greater	18.00-90.00	48.00	54.70	48.00	42.60	66.70	53.30	58.00	54.80	45.00	47.70	39.80	38.40	-
	Dollars		Dollars			Dollars								
Roller or hammer mill														
Cost per bushel	0.016-0.450	0.162	0.167	0.154	0.170	0.117	-	0.217	0.124	-	0.122	0.242	0.218	-
Cost per hour	30.00-100.00	56.30	65.00	-	-	-	-	-	-	-	-	-	-	-
	Dollars/hour[2]		Dollars/hour[2]			Dollars/hour[2]								
Miscellaneous services														
Bulldozer use	40.00-250.00	104.00	86.70	111.00	106.00	93.80	67.50	-	101.00	87.00	104.00	126.00	116.00	83.30
Rotary mowing														
Under 60 HP	3.00-50.00	25.80	-	-	-	-	-	-	-	-	-	-	-	-
60-100 HP	10.00-107.00	46.90	-	44.80	-	-	-	-	49.80	-	-	-	-	-
Over 100 HP	8.00-120.00	33.50	45.00	25.90	51.00	-	-	-	26.80	-	-	25.30	-	-

- Insufficient data. [1]Rates are for machinery use only. Fuel and operator are provided by the user. [2]Includes the cost of fuel and labor.

FARM LABOR, WISCONSIN, 2017

Category	Range in Rates	Statewide Average	Regional Averages			District Averages								
			1	2	3	NW	NC	NE	WC	C	EC	SW	SC	SE
	Dollars per hour		Dollars per hour			Dollars per hour								
General farm labor	8.00-40.00	14.00	14.10	13.50	14.20	15.50	14.30	12.80	14.10	13.60	14.40	12.70	13.60	15.80
Truck driver/machine operator	10.00-40.00	16.90	17.10	16.00	17.30	17.20	18.00	16.30	16.70	16.70	18.40	14.80	15.80	19.90

- Insufficient data.

CONTACT:

Your input is important to us. If you have any comments or suggestions regarding this report, please call (800)789-9277 or write to:

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2811 Agriculture Dr, Madison, WI 53718-6777.
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This report may be viewed and printed online at: www.nass.usda.gov/wi under "More State Features."

FURTHER INFORMATION:

To better determine an appropriate charge in your situation, you are encouraged to obtain Bulletin A3510, titled "Estimating Agricultural Field Machinery Costs" from your county UWExtension office or at:

https://learningstore.uwex.edu/Assets/pdfs/A3510.pdf