Shawano Ag Newsletter

University of Wisconsin Cooperative Extension

April 2017

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

Ag Agent:
Jamie Patton
jamie.patton@ces.uwex.edu

IN THIS ISSUE:

Greetings!

Spring is the time to clean, right? Along these lines, this spring we are cleaning and updating the Shawano County Agriculture Newsletter mailing list.

We are asking you to respond to our office by April 15th, via the enclosed postcard, via phone (715) 526-6136 or at our website (http://shawano.uwex.edu/agriculture) as to your newsletter preference:

- ⇒ **I would like to receive the newsletter via email.**
- ⇒ **I would like to receive a paper copy of the newsletter.**
- ⇒ **I no longer want to receive the newsletter.**

I encourage you to choose the email option, if you're able and willing. Communicating with you electronically is *quick, inexpensive and efficient* and ensures you receive our news updates in a timely manner. We will not share your e-mail address and will only send you an email when the newsletter has been published.

The Shawano County UW-Extension office strives to make its resources accessible and convenient for you. I encourage you to visit our website at **http://shawano.uwex.edu**, like us on Facebook at **http://www.facebook.com/uwex.shawano.ag/**, or follow us on Twitter at **@Ag_UWEXShawano** for up-to-date information on our programs and efforts.

I thank you in advance for your participation and look forward to hearing from you!

Jamie.

Farm Machinery/Tractor Safety Classes at NWTC

Summer 2017

Green Bay:	June 19-22, 9 am – 3 pm
Luxemburg:	June 26-29, 9 am – 3 pm
Shawano:	June 19-23 (no class on June 21), 9 am – 3 pm

Registration:
Please call: (920) 498-5444 or (888) 385-NWTC, register online at http://www.nwtc.edu , or register in person at an NWTC campus or regional learning center.

This course will provide youth, primarily under the age of 16, but not younger than 12, with the necessary training and preparation to take the evaluation test. Students who successfully pass the test and proficiency skills evaluation will be granted a state certificate of completion.

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Producer and Agribusiness Professionals Peer Group Upcoming Meetings

April 6, 2017

Green Valley Town Hall
W1734 Hwy E, Cecil, WI 54111
Loan Opportunities through FSA
Presenter: Shawano-Menominee Farm Service Agency

Meetings start at 6:30pm with a light supper and the presentation/discussion at 7:15pm.

Free to attend, pre-registration is requested by contacting Sarah Mills-Lloyd at 920-834-6845 or emailing to sarah.millslloyd@ces.uwex.edu for an accurate meal count and materials.

Thank you to our meal sponsors!

GreenStone® FARM CREDIT SERVICES

PNB Peshtigo National Bank

Photo Courtesy of UW-Madison CALS

60th Annual

Outstanding Young Farmer & Friends of Shawano County

Agriculture Awards Banquet

Friday, April 7th

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 Farm Bureau Scholarships ꕥ

Please preregister by March 31st with:

Shawano County UW-Extension (715) 526-6136 OR
Tammy Styczynski (715) 853-5555

UW Extension
University of Wisconsin-Extension

A Day with Agriculture Engineers

Are you thinking about modernizing, but have questions?
Bring your questions along with building plans and ideas for an interactive day with UW-Madison Biologic Systems Engineers.

FEATURING:

Dr. Dave Kammel
Dairy Modernization: Remodeling facilities, farmstead planning, livestock barn designs for calves, heifers and cows

Dr. Becky Larson
Manure and Agriculture By-Products Handling, Processing and Transport Systems

Dr. Brian Luck
Precision Agriculture and Machinery Issues

Dr. Doug Reinemann
Milking Machines and Management, Robotic Milking and Farm Energy Issues

Meeting Details
Registration: 9:30 am
Meeting: 10 am to 3 pm
Registration Fee:
Includes Meal & Material

Wednesday—April 12, 2017

Gillett Community Center
(Former BMO Harris Bank)
200 E Main St, Gillett, WI 54124

AVAILABILTY LIMITED TO TWELVE FARMS
—and—
Two People Per Farm

For More Information Contact a UW-Extension Agriculture Agent:

Jamie Patton
Shawano County
jamie.patton@uwex.edu
715-526-6136

Sarah Mills-Lloyd
Oconto County
sarah.millslloyd@uwex.edu
920-834-6845

Scott Reuss
Marinette County
scott.reuss@uwex.edu
715-732-7510

A Day with Agriculture Engineers Registration Form

Name(s):_____County:_____
Business: _____Telephone: _____
Address: _____ City/State/ZIP: _____
Email address (for a direct mailing in future years): _____
Registration: ____Person x $25 per person (includes meal & materials) = $_____
____Farm Operation x $40 (includes meal & 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

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.

This publication is available from your county UW-Extension office (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.

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."

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

UW-Extension Dairy Team

Spring 2016

The Ideal Footbath

A footbath is one of the most important tools used on farms to prevent lameness and maintain hoof health. When used properly and paired with a disinfectant, a footbath can prevent and control foot rot and digital dermatitis on dairy farms. Recently, the recommendations for footbath dimensions have changed after new research was conducted at the UW School of Veterinary Medicine.

This fact sheet will focus on the proper installation and use of foot baths on dairy farms and the prevention of lameness in dairy cattle. Specific topics covered on the following pages include:

- New footbath recommendations
- Footbath location
- Retrofitting your current footbath

Updated Footbath Recommendations

Recent research has concluded many of the previous footbath recommendations should be disregarded.

- The updated footbath recommendations features side walls that are sloped outwardly at a 70° angle to ensure cattle are getting their feet in the treatment bath with each step. Another innovative feature put into the new footbath design is the high walls that are put on the sides. These walls are three feet high and ideally one side would be hinged and able to drop down as a precaution, acknowledging the possibility that a cow may go down while going through the footbath.
- The recommended length of footbaths has increased to 10-12 feet, based on a behavioral trial that was recently conducted. The goal when using a footbath is to have at least two immersions per hoof. The likelihood of this increases from 53 percent in a footbath 6 feet long, to 84 percent in an 8 feet long footbath, and to 96 percent in a 10 feet long footbath. In conclusion, a footbath must be 10 feet long in order to evenly transfer our chemicals onto each hoof as the cattle walk through.
- In the same study, step-in height was also evaluated. A trial was done with a 5-inch step in height and another with a 10-inch step in height. The cows

Authored by:

Olivia Hennes
Dairy & Livestock Intern
Outagamie County
olivia.hennes@outagamie.org
920-832-5129
http://fyi.uwex.edu/dairy

Zen Miller
Dairy & Livestock Agent
Outagamie County
Zen.miller@uwex.edu
920-832-5129
http:fyi.uwex.edu/dairy

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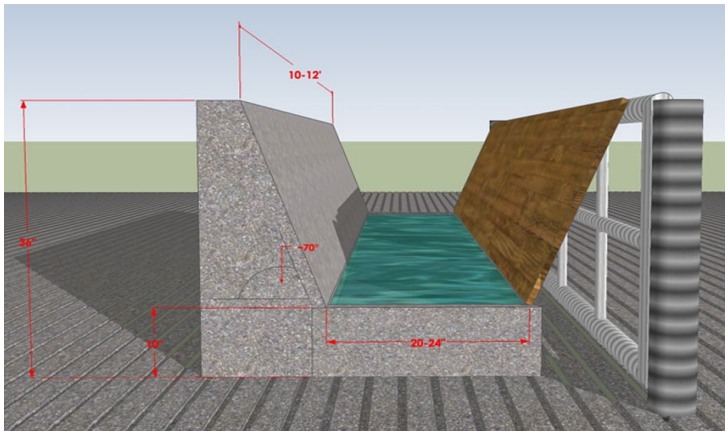
responded well to the deeper step, and using a 10-inch step-in height will help retain more of the chemical. With a 10-inch step, baths can be filled with three to four inch depths and still have enough chemical left when the last cow passes through, which is not possible with a five inch step-in height.

- Another dimension that was looked at in this study was width of bath. It was determined cows will pass through a footbath with a minimum of 20 inches of width, but it is still recommended footbaths be at least 24 inches wide just to keep the traffic flowing through the bath.
- In conclusion, the UW School of Veterinary Medicine's Dairyland Initiative Footbath Blueprint recommends a footbath 12 feet long, 24 inches wide, with a step-in height of 10 inches. If this footbath is filled to the most desirable level, which is 3.5 inches, then this bath would hold approximately 52 gallons of solution, which is the same as the traditional footbaths. Side walls should be sloped from a height of three feet above the floor of the bath to the upper edge of the bath, and the sides should be enclosed to create a tunnel.



Source: UW School of Veterinary Medicine's Dairyland Initiative

Footbath Location

The best possible place for footbaths to be located in a free stall or bedded pack/compost barn set up is transfer lanes between the holding area and the pens and in the return lanes on either side of the holding area. If a footbath is located in the return lane, it should typically be about two-thirds of the way down the return alley to prevent cows from causing a jam after exiting the parlor.

In a tie stall barn set up the footbath should be located where the cows exit the barn or a location where cows must pass through the footbath safely.

UW School of Veterinary Medicine's Footbath Blueprint recommends footbath dimensions to be:

- 12 feet long
- 24 inches wide
- 10 inch step-in height

If this footbath is filled to 3.5 inches then this footbath would hold approximately 52 gallons of solution, which is the same as the traditional footbaths

Acknowledgements

Recommendations in this factsheet are from the UW School of Veterinary Medicine Food Animal Production Medicine's Dairyland Initiative. For more information, please visit http://thedairylandinitiative.vetmed.wisc.edu/.

This factsheet is one of several factsheets in the "Walking Strong" Series on Dairy Hoof Health developed by UW-Extension Agriculture Agents:

Aerica Bjurstrom, Project Leader
UW-Extension Kewaunee County

Liz Binversie
UW-Extension Brown County

Greg Blonde
UW-Extension Waupaca Co

Scott Gunderson
UW-Extension Manitowoc Co

Tina Kohlman
UW-Extension Fond du Lac Co

Darrell McCauley
UW-Extension Winnebago Co

Zen Miller
UW-Extension Outagamie Co

Sarah Mills-Lloyd
UW-Extension Oconto Co

Jamie Patton
UW-Extension Shawano Co

Eric Ronk
UW-Extension Calumet Co

Olivia Hennes
UW-Extension Outagamie County Summer Intern

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

Dennis Cosgrove, Extension Forage Agronomist
University of Wisconsin – River Falls
dennis.r.cosgrove@uwrf.edu
Dan Undersander, Extension Forage Agronomist
University of Wisconsin – Madison
djunders@facstaff.wisc.edu

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.

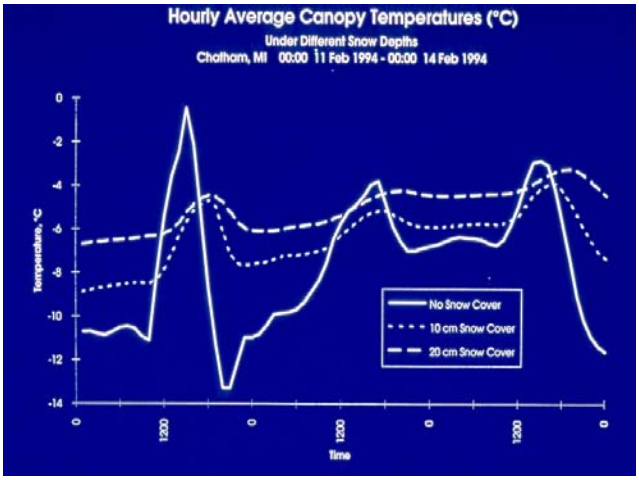


Figure 1. Effect of snow depth on soil temperature.

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

Calendar of Local Upcoming Events

Date	Workshop	Location	Cost	Registration Requirement
March 28-30	WPS Farm Show	EAA Grounds Oshkosh		
April 6	Peer-Group Meeting—FSA Loan Programs	Green Valley Community Center, Advance	$0	Shawano UWEX
April 7	Shawano County Agriculture Awards Banquet	The Main Event Cecil	$15	Shawano UWEX
April 12	A Day with Ag Engineers	Gillett Community Center Gillett	Varies	Oconto UWEX
May 5	Farm Management Update for Agricultural Professionals	Liberty Hall Kimberly	TBD	TBD

Videos: Grain Crops Management in Low-Margin Years

UWEX has recorded a series of talks, "Grain Management in Low-Margin Years", that address how to best handle different aspects of crop production during low-margin years. These were presented by UWEX state specialists this winter throughout Wisconsin at meeting hosted by UW Agriculture and Natural Resources Extension agents.

You can watch a specific video on the UW Integrated Pest and Crop Management YouTube channel at **https://www.youtube.com/user/uwipm/featured**. There is a table of contents below each video with quick links to jump to key parts in longer videos.

Soybean Inputs that Deliver the Highest ROI in a Low-Margin Year
– Shawn Conley, UW Agronomy, Soybean and Small Grains Specialist (40 min)

Practical Weed Management for Low-Margin Years
– Dan Smith, UW NPM, Southwest Regional Specialist (14 min)

Fundamental Soil Fertility Strategies for Success
– Carrie Laboski, UW Soil Science, Soil Fertility/Nutrient Management Specialist (37 min)

How to Survive and Thrive on Current Corn Price Projections
– Joe Lauer, UW Agronomy, Corn Specialist (41 min)

Low Grain Prices = Smart Disease Management Decisions
– Damon Smith, UW Plant Pathology, Field Crops Pathology Specialist (29 min)

Managing Insects Economically Using Conventional Hybrids and Thresholds
– Bryan Jensen, UW Entomology, Field Crops Entomology Specialist (38 min)

Machinery/Technology Management and Tillage Considerations to Reduce Operational Costs
– Francisco Arriaga, UW Soil Science, Soil Science Specialist and Brian Luck, UW Biological System Engineering, Machinery Specialist (16 & 10 min)

Partial Budget Analysis: A Practical Tool for Low Margin Years
– Paul Mitchell, UW Ag & Applied Econ, Cropping Systems Specialist (31 min)