



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

Website:
<http://shawano.uwex.edu>

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uwex.shawano.ag

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

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



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<http://learningstore.uwex.edu/>

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Shawano Ag Newsletter

University of Wisconsin Cooperative Extension

October/November 2016

Greetings!

Harvest season is in full swing! That is, when the weather is cooperating. With all these wet days, we are going to run into some grain quality and harvest issues. I encourage you to peruse the Crop Protection Network website for excellent, University-reviewed resources on crop and harvest management, including:

Ear Rot: <http://cropprotectionnetwork.org/corn-diseases/ear-rots/>

Mycotoxins: <http://cropprotectionnetwork.org/corn-diseases/mycotoxin-fags/>

The site also contains helpful resources when planning for next year:

White Mold: <http://cropprotectionnetwork.org/soybean-diseases/white-mold/>

Over the past few months, the Agriculture Agents in northeast Wisconsin have been working with a number of farms showing producers how to identify, monitor and treat digital dermatitis (hairy heel warts) in dairy herds. As part of the project, we have written several fact sheets on hoof health. I have included one of the fact sheets in this newsletter. The other fact sheets can be found at: <http://fyi.uwex.edu/dairy/resources/animal-well-being-herd-health/> under "Walking Strong". If you are interested in learning more about monitoring digital dermatitis in your herd, please don't hesitate to call!

With the recent deaths of two young men in our area from manure-related accidents, I encourage you to review a recent UWEX webinar on manure gas safety. The recorded webinar can be viewed at your convenience at: <http://fyi.uwex.edu/agsafety/2016/09/13/manure-gas-safety-webinar/>. In addition, the webpage lists links to several static resources from UW-Extension, the Center for Agricultural Health, and OSHA on manure gas monitoring, as well as recommendations and requirements when working in confined spaces.

As harvest season winds down at the end of the month, the pace of Extension "meeting season" starts to quicken. I have included several flyers and "Save the Date" notices in this newsletter. As I only send out newsletters every other month, you can find the most up-to-date information on upcoming meetings on the Shawano UWEX website and Facebook page.

Last, but not least, please remember the deadline for full compliance with the Veterinary Feed Directive (VFD) is quickly approaching. More information on the VFD and example record keeping documents can be found at: <http://fyi.uwex.edu/wbic/2016/01/29/new-vfd-veterinary-feed-directive-record-keeping-tools-available/>

Stay safe this busy harvest season. Please don't hesitate to give the office a call if I can be of any assistance!

Jamie Patton

THE UNIVERSITY OF WISCONSIN – UNITED STATES DEPARTMENT OF AGRICULTURE

UW-Extension provides equal opportunities in employment and programming including Title IX requirements. UW-Extension programs are open to all persons without regard to race, color, ethnic background or economic circumstances. Please make requests for reasonable accommodations to ensure access to educational programs as early as possible preceding the event. Requests will be kept confidential.

Reminder of Implements of Husbandry Rules

Cheryl Skjolaas, UWEX Agricultural Safety and Health Specialist

Parking a transport vehicle (CMV, Ag CMV, motor truck, IoH and transport wagon) on the roadway or right of way.

Only law enforcement officers can block a highway from both directions. In some counties, special permits are needed to park on the right of way – check with your local county highway department. In some situations a flag person may also be required.

s. 346.51 Wis. Stats. Stopping, standing or parking outside of business or residence districts.

(1) No person shall park, stop or leave standing any vehicle, whether attended or unattended, upon the roadway of any highway outside a business or residence district when it is practical to park, stop or leave such vehicle standing off the roadway, but even the parking, stopping or standing of a vehicle off the roadway of such highway is unlawful **unless the following requirements are met:**

- (a) An unobstructed width of **at least 15 feet** upon the roadway of such highway must be left opposite such standing vehicle for the free passage of other vehicles.
- (b) Such standing vehicle must be capable of being seen by operators of other vehicles from a **distance of 500 feet** in each direction along such highway.

Mud, field debris or manure left on the roadway

S. 346.59 Wis. Stats. Placing injurious substance on highway.

(5) No person shall place or cause to be placed upon a highway any foreign substance which is or may be injurious to any vehicle or part thereof.

(7) Spilling loads of waste or foreign matter. The operator of every vehicle transporting waste or foreign matter on the highways of this state shall provide adequate facilities to prevent such waste from spilling on or along the highways.

Load securement

ss 348.10(2) Wis. Stats

No person shall operate a vehicle on a highway unless such vehicle is so constructed and loaded as to prevent its contents from dropping, sifting, leaking or otherwise escaping therefrom.

Wet conditions

You may also find that local road authorities have placed special conditions on No Fee Permits allowing them to suspend permit in wet conditions. Check your No Fee Permit for inclusion of such exclusions.

Upper Midwest Hay Price Summary by Quality Grade

Report from September 26, 2016

Hay Grade	Bale type	----- Price (\$/ton) -----		
		Average	Minimum	Maximum
Prime (> 151 RFV/RFQ)	Small Square	\$232.00	\$200.00	\$330.00
	Large Square	\$173.00	\$100.00	\$220.00
	Large Round	\$93.00	\$80.00	\$105.00
Grade 1 (125 to 150 RFV/RFQ)	Small Square	\$151.00	\$88.00	\$250.00
	Large Square	\$125.00	\$80.00	\$190.00
	Large Round	\$76.00	\$40.00	\$125.00
Grade 2 (103 to 124 RFV/RFQ)	Small Square	No Reported Sales		
	Large Square	\$92.00	\$50.00	\$160.00
	Large Round	\$62.00	\$42.00	\$80.00
Grade 3 (87 to 102 RFV/RFQ)	Small Square	No Reported Sales		
	Large Square	\$48.00	\$15.00	\$100.00
	Large Round	\$50.00	\$28.00	\$65.00



Shawano County Forage Council

A Midwest Forage Association Affiliate

Shawano County UW-Extension

311 North Main Street

Shawano, WI 54166

715.526.6136

Fall Cover Crops Field Day October 27, 2016

Soil Health Discussion and Cover Crop Demonstration

Angelica Town Hall
N3285 County Rd C, Pulaski, WI 54162

10:00 am Presentations

Soil Health – What's all the Hype?

Jamie Patton, Shawano County UW-Extension

Growing Cover Crops in Shawano County

Barry Bubolz, Shawano County USDA-NRCS

Cover Crops Research in Wisconsin

Jim Stute, Michael Fields Institute

12:00 Lunch – Enjoy free lunch sponsored by Shawano Forage Council

1:00 pm **Cover Crop Plots** – Demonstration plots of single and multiple species cover crop mixes planted after wheat will be discussed. Direction to the plot will be given at the meeting.

To help us plan for lunch, please **REGISTER** by **October 21**
Shawano County UW-Extension office at (715) 526-6136.

This event is free and everyone is invited!



2016 – 2017 Wisconsin Farm Succession and Estate Planning UW-Extension state-wide WEBINAR series

Marinette/Oconto/Shawano UW-Extension are offering a series of webinars on farm succession and estate planning. Pre-registration is recommended. Call the host office to register and to receive location information.

- October 27 – **Overview of Succession Planning** – Joy Kirkpatrick, Center for Dairy Profitability – (1:00 – 3:00 pm) – Marinette County UWEX – (715) 732-7510
- November 17 – **How Big is Your House? - How Big Does It Need To Be? Financial Analysis for Succession Planning** – Kevin Bernhardt, UW-Extension Farm Management Specialist – (1:00 – 3:00 pm) – Oconto County UWEX – (920) 834-6845
- January 26 – **Estate Planning** – Bridget Finke, Attorney, Bakke Norman Law Offices – (1:00 – 3:00 pm) – Shawano County UWEX—Shawano County Courthouse, Room A/B— (715) 526-6136
- February 23 – **Long Term Care: Planning for My Future Needs** – Steve Shapiro, Medigap Insurance Specialist, State of Wisconsin Board on Aging and Long Term Care and the Wisconsin Office of the Commissioner of Insurance – (1:00 – 3:00 pm) – Marinette County UWEX – (715) 732-7510
- March 23 – **Medicaid Eligibility and Recovery** – Anthony Schmoldt, Attorney, Schmoldt Law Office – (1:00-3:00 pm) – Oconto County UWEX – (920) 834-6845



Tuesday, November 1, 2016

8:00 – 9:30 pm

Dave, Bob, Karen, and Nick Dorn
N3415 State Road 47, Appleton WI
140 cows, raise their own heifers,
170,000 SCC, Farm 850 acres

Topics & Speakers

To Cut or Not to Cut: Alfalfa Dollars & Sense

Sara Maass-Pate, Farm Trainer
Fox Valley Technical College
Kevin Jarek, UW-Extension Crops & Soils Agent,
Outagamie County

What the NDF is Going On?

Kevin Rauchholtz, Agriculture Instructor
Fox Valley Technical College

Wednesday, November 9, 2016

8:00 – 9:30 pm

Van-Han Registered Holsteins
N1974 County Trunk N, Appleton WI
80 cows, 23,100 RHA 180,000 SCC,
120 acres owned 580 rented

Topics & Speakers

Selling Unused Colostrum

Alane Uhe, Seymour Colostrum
Rodney Hodgson, Zinpro Performance Colostrum

Is Your Trailer Ready for the Road?

Kory Stalsberg, UW-Extension Dairy/Livestock Agent,
Grant & Lafayette County

Questions?

Zen Miller | Agriculture Dairy/Livestock Agent
Outagamie County – UW Extension
920-832-5124 zen.miller@ces.uwex.edu

2016 Wisconsin Pest Management Update Meetings

The schedule for the Wisconsin Pest Management Update meeting series is listed below. Presentations will include pest management information for Wisconsin field and forage crops. Speakers will include Mark Renz, weed scientist, Damon Smith, plant pathologist, Dan Heider IPM specialist and Bryan Jensen, entomologist.

The format has changed for 2016. Meetings will either be in the morning or afternoon and will run for 3 hours. Morning meetings will begin promptly at 9am and run to 12pm with lunch to follow. Afternoon meetings will begin at 1pm and conclude at 4pm with lunch served from 12pm-1pm.

Three hours of Certified Crop Advisor CEU credits in pest management are requested for each session.

Please make your reservation with the host agent at least one week prior to the scheduled meeting date.

DATE	LOCATION	HOST AGENT
Monday November 7 <i>1pm – 4pm</i>	<u>Marshfield</u> Marshfield Agricultural Research Station 2611 Yellowstone Drive Marshfield, WI 54449	Richard Halopka Clark County Extension Courthouse Room 104 517 Court Street Neillsville, WI 54456 (715) 743-5121
Tuesday November 8 <i>9am-12pm</i>	<u>Chippewa Falls</u> Lake Hallie Eagles Club 2588 Hallie Road Chippewa Falls, WI 54729	Jerry Clark Chippewa County Extension 711 N. Bridge Street Chippewa Falls, WI 54729 (715) 726- 7950
Wednesday November 9 <i>9am-12pm</i>	<u>Belmont</u> Belmont Inn & Suites (formerly Baymont Inn) 103 West Mound View Avenue Belmont, WI 53510	Ted Bay Grant County Extension P.O. Box 31 Lancaster, WI 53813 (608) 723-2125
Wednesday November 9 <i>1pm-4pm</i>	<u>Janesville</u> Holiday Inn Express Janesville 3100 Wellington Place Janesville, Wisconsin 53546 (I-90 and US Highway 14, West on 14)	Nick Baker Rock County Extension 51 S. Main Street Janesville, WI 53545 (608)-757-5698
Thursday November 10 <i>9am-12pm</i>	<u>Fond du Lac</u> University of Wisconsin – Fond du Lac Rm 113 University Center 400 University Drive Fond du Lac, WI 54935	Loretta Ortiz-Ribbing Fond du Lac County Extension 227 Admin/Extension Bldg. 400 University Dr. Fond du Lac, WI 54935 (920) 929-3171
Thursday November 10 <i>1pm-4pm</i>	<u>Kimberly</u> Liberty Hall 800 Eisenhower Drive Kimberly, Wisconsin 54136 (Hwy. 441, College Avenue Exit, East 1 block)	Kevin Jarek Outagamie Co. UW Extension 3365 W. Brewster St. Appleton, WI 54914 Phone: 920-832-5128
Friday November 11 <i>9am-12pm</i>	<u>Sparta</u> Jake's Northwoods 1132 Angelo Road Sparta, WI 54656	Bill Halfman Monroe County Extension 14345 County Hwy B Sparta, WI 54656 (608) 269-8722

Heart of the Farm

A Program for Women in Agriculture



Thursday, November 3, 2016

Chase Community Hall
8481 County Road S
Pulaski, WI 54162

9:30 am—3:15 pm

UW
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Sponsors



This program is sponsored by
UW-Extension in Marinette, Oconto
and Shawano Counties

Heart of the Farm is also supported by the
following organizations:



**WISCONSIN MILK
MARKETING BOARD**
WISCONSIN DAIRY PRODUCERS

If you have any questions, please contact:

Jamie Patton, Shawano County
(715) 526-6136 or jamie.patton@ces.uwex.edu

Sarah Mills-Lloyd, Oconto County
(920) 834-6845 or sarah.mills@ces.uwex.edu

Scott Reuss, Marinette County
(715) 732-7510 or scott.reuss@ces.uwex.edu

University of Wisconsin-Extension, U.S. Department of
Agriculture, and Wisconsin counties cooperating.
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ADA.

Registration Form

Registration due by October 21, 2016

Name: _____

Address: _____

City/ State: _____

Zip: _____ County: _____

Phone: _____

Please indicate dietary restrictions:

Registration Cost: \$20.00

Send Registration form and check to:

Oconto County UW-Extension
c/o Heart of the Farm
Oconto County Courthouse—Room 3033
301 Washington Street
Oconto, WI 54153

Please make checks payable to:
UW-Extension

Heart of the Farm— The Chase Community Hall

Mission

Farm Management and Production Education for Women

An opportunity to connect with other women in agriculture!

Agenda

9:30 am	Registration
10:00 am	The Secret Ingredient for National Award Winning Pies
11:00 am	Make Your Own Barn Quilt
12:30 pm	Lunch (Provided)
1:00 pm	Legalities of Direct Selling Homemade Food Creations
2:00 pm	The Soil Beneath our Feet
3:00 pm	Wrap-up and Evaluations
3:15 pm	Adjourn

Speakers

The Secret Ingredient for National Award Winning Pies

Caroline Imig—National Award Winning Pie Maker,
Wayne's Family Restaurant

Learn what it takes to make national award winning pies and the secrets to crafting a successful show-stopping pie just in time for the holidays!

Make Your Own Barn Quilt

Lynn Jones—Barn Quilts of Oconto County Coordinator, *New View Industries*

Take a journey along Oconto County's barn quilt trail and find out what Barn Quilts of Oconto County is all about. Learn quilt painting techniques while creating a miniature block of your own! Choose from an assortment of patterns and colors. Painting smocks and all supplies will be provided.

Legalities of Direct Selling Homemade Food Creations

Scott Reuss—Agriculture Agent, *Marinette County*

Do you have a great recipe for jam, jelly, salsa or another home-canned item? Do others say they would pay money for it if you sold it? Understand the laws on selling your homemade food items in this session.

The Soil Beneath Our Feet

Jamie Patton—Agriculture Agent, *Shawano County*

Soil is a living system with an immense capacity to sustain plant and animal productivity, maintain or enhance water and air quality and promote plant and animal health. Learn about composition of surface soil microorganisms in northeast Wisconsin soils and the importance of these critters in your garden and your fields.

Goal

The *Heart of the Farm — Women in Agriculture Conference* addresses the needs of farm women by providing education on pertinent topics, connecting them with agricultural resources, and creating support networks.



Cost: \$20.00/person

Meeting Location:
Chase Community Hall
8481 County Road S
Pulaski, WI 54162



Please contact us for special assistance regarding our programs.

Requests are confidential.

UW-Extension provides equal opportunities in employment and programming, including Title IX and ADA.



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Raising Quality Calves

Tuesday, December 6, 2016

Liberty Hall Conference Center
800 Eisenhower Drive, Kimberly, WI

Registration: 9:30 am
Meeting: 10 am-3 pm

Registration Fee:
\$35 per person in advance
(includes lunch & materials)

\$10 additional "Walk-in"
Fee will be charged after
February 10th

For more information:

Tina Kohlman
Dairy & Livestock Agent
Fond du Lac County
tina.kohlman@uwex.edu
920.929.3171

Sarah Mills-Lloyd
Agriculture Agent
Oconto County
sarah.millsloyd@uwex.edu
920.834.6845

Many farms are looking at group feeding calves with automated feeders to reduce the labor of feeding individual calves. University extension specialists will share how to design automated calf barns to meet the management needs to raise healthy calves and what are the key factors associated with the successful use of automated feeders.

Also, learn how nutrition plans an important role in the calf's ability to respond to everyday stressors and learn what your role is in the implementation of the Veterinary Feed Directive (VFD).

- ◆ **Key Factors Associated with the Successful Use of Automated Calf Feeders**
- ◆ **Designing or Remodeling Group Calf Feeding Barns for Excellent Calf Health**
- ◆ **The Alphabet Soup of the Veterinary Feed Directive-Overview of the VFD & Why it Matters**
- ◆ **Nutritional Impacts on Calf Health: Myths & Truths**

Presenters:

Marcia Endres, PhD
Extension Specialist
University of Minnesota

Tom Earleywine, PhD
Director, Nutritional Services
Land O' Lakes Milk Products

Sarah Mills-Lloyd, DVM
Agriculture Agent
UW-Extension Oconto Co

David Kammel, PhD
Extension Dairy Engineer Specialist
UW-Madison/ UW-Extension

2016 Raising Quality Dairy Calves Meeting Registration

Name(s): _____

Company: _____ Telephone: _____

Address: _____ City/State/ZIP: _____

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

Registration: _____ People x \$35 per person (includes meals & materials) = \$ _____

_____ **Additional Walk-in/Late Fee after November 23rd x \$10 per person** + \$ _____

Total Enclosed: = \$ _____

Make Check Payable to: **UW Extension**
UW-Extension Fond du Lac County
400 University Drive, Room AE-227
Fond du Lac, WI 54935

Or to use a credit card (for a \$1.50 courtesy fee),
please contact UW-Extension Fond du Lac County
Program Assistant Tina Engelhardt at 920.929.3171.

Registration is due November 23rd or a \$10 per person Walk-in/Late Fee will be added

UW-Extension provides equal opportunities in employment & programming, including Title IX requirements.

2017 CAFO Workshops

Save the Date

January 31; 8:00 am: Green Bay

January 31; 12:00 pm: New London

February 1; 8:00 am: Manitowoc

February 1; 12:00 pm: Fond du Lac

February 6; 10:00 am: Jefferson

February 7; TBD: Dodgeville

February 9; 12:00 pm: Rice Lake

February 10; 12:00 pm: Marshfield



An update meeting for WPDES permitted CAFO owners & managers, nutrient management plan writers and engineers.

University of Wisconsin, U.S. Department of Agriculture and Wisconsin counties cooperating. An EEO/AA employer, University of Wisconsin Extension provides equal opportunities in employment and programming, including Title IX and American with Disabilities (ADA) requirements. Contact Kevin Erb at 920-391-4652 for more information on this program.

Midwest Manure Summit

www.midwestmanure.org

Save the Date

**UW
Extension**
University of Wisconsin-Extension

February 22 & 23, 2017

Midwest Manure Summit

**Radisson Hotel and Conference Center
Green Bay, Wisconsin**

For more information or to register, please visit:

www.midwestmanure.org

Midwest Manure Summit, Pre-Summit and Tours!

**2016 Midwest Manure Facility Tours
December 1, 2016**

**2017 Midwest Manure Pre-Summit
February 21, 2017**

**2017 Midwest Manure Summit
February 22 and 23, 2017**

Questions? Contact –

Liz Binversie – Brown County UW-Extension – (920) 391-4612

Jamie Patton – Shawano County UW-Extension – (715) 526-6136

**UW
Extension**
University of Wisconsin-Extension

Midwest Manure Summit
www.midwestmanure.org

Save the Date for 2017 Cow College!



January 10th—1 to 3 pm —Fox Valley Technical College, Clintonville

Dr Paul Fricke and Dr Pam Ruegg

UW School of Veterinary Medicine, dairy reproduction and milk quality

January 17th—1 to 3 pm—Fox Valley Technical College, Clintonville

Dr. Dorte Doepfer

UW School of Veterinary Medicine, digital dermatitis monitoring and management

January 24th—On-farm tours of Lely and Boumatic robots

Dr. Larry Tranel

Iowa State University Extension Dairy Specialist, presenting on robotic milking systems and cost analysis

More information coming in the next newsletter!

Changes in Administrative Codes Regulating Dairy Farms

Kevin Erb, UWEX Conservation Professional Development & Training Coordinator

There have been changes to the Administrative Codes regulating dairy farms. As of September 1st ATCP 65 took effect which replaced ATCP 60 Dairy Farms and ATCP 80 Dairy Plants. With that change, a number of regulations were changed to bring Wisconsin's Administrative Code more in line with the Pasteurized Milk Ordinance. Under the new rules, ATCP 65.22(6)(c) does not allow the mixing of human septage and animal waste on any dairy farm regardless of whether they are Grade A or Grade B.

The previous rules allowed Grade B dairy farms to mix the wastes. Older NRCS and WI DNR policies also allowed up to 25,000 gallons of non-manure wastewater to be added to manure storage to aid agitation and pumping, but any storages built using the newer (2012 or after) USDA NRCS 313 standard, and in most counties whose ordinances reference the newer standards, are not allowed to add non-dairy wastes to the storage.

Grey waters (sinks, milking parlor washdowns, etc) are still allowed under ATCP, NRCS and DNR rules. The only clarification under the current state code is that they cannot be added to the gutter in the milking barn or parlor. They must be pumped/piped directly to the manure storage structure.

The specific rule is as follows:

ATCP 65.22(6)

(a) Every dairy farm shall have one or more sanitary toilets that are conveniently accessible by persons engaged in milking operations. A conveniently accessible toilet may include a toilet in a farm residence or other farm building.

(b) Toilets, under par. (a), shall comply with ch. SPS 362. Toilets shall be kept in clean and sanitary condition.

(c) There shall be no mixing or storage of human waste or septage with animal manure on a dairy farm.

Questions can be directed to:

Michelle R Steinmetz

Dairy Technical Specialist, Wisconsin Department of Agriculture Trade and Consumer Protection

Division of Food and Recreational Safety

(715) 401-1393

Spring 2016



Footbath Management

Footbaths are the most commonly used management tool to control Digital Dermatitis (DD) on dairy farms. Proper footbath use will make DD management more effective and save money by reducing the amount of solution used. Footbaths are designed for disinfecting hooves and preventing DD, not for therapy or treatment. Once a cow has DD, she cannot be cured, only managed. However, preventing DD from spreading in a herd can be managed through footbath use. It is recommended that open lesions be detected and topically treated before sending the cow through a footbath. Consult your veterinarian about topical treatment options.

feet long so each cow steps in the bath twice with each hoof. Solution depth should be maintained at a minimum of four inches so dewclaws are submerged as the cow passes through. Footbaths can be topped off to maintain at least four inches of depth. Solution concentration should remain at its recommended percentage according to the product label.



Properly maintained footbath solution should be maintained at a depth of four inches.

Effectiveness of footbaths in preventing infectious lesions is dependent upon a number of factors including footbath solution, frequency of changing solutions, footbath dimensions, footbath placement and animal hygiene.

Footbath Sizing and Use

Footbaths should be a minimum of 10

Replacing or changing the footbath solution is dependent on hoof and leg hygiene of the cows. Solution should be changed after 150 to 350 cows pass through the footbath. If cows have cleaner hooves and legs, solution can be changed after 300 to 350 cows have passed through the footbath. If cows have dirty hooves and legs, the solution should be changed

Authored by:

Aerica Bjurstrom
Agriculture Agent
aerica.bjurstrom@uwex.edu
920-388-7138
<http://fyi.uwex.edu/dairy>



more frequently. It is important for you to monitor your individual farm to determine how often changing the solution is best for your herd.

Footbath Solution

Footbath solution should be maintained at 3.5–5.5 pH. Making the solution too acid or too alkaline will not improve DD management results. Skin has a normal pH of 4–5.5, therefore maintaining pH at normal skin level will help maintain healthy skin condition and improve treatment results.

Optimum treatment concentration is not a one-size-fits-all practice. Depending on the type of treatment used, different concentration rates will be utilized.

Copper sulfate solutions are commonly used in footbaths. Copper sulfate's antibacterial properties help keep the hoof clean, and it also has a hardening effect on the claw horn. Popularity of copper sulfate footbaths can be attributed to both its relatively low cost per animal treated and common perception among farmers it effectively controls infectious lesions. Research has shown that using copper sulfate footbaths decreases both incidence and severity of hoof lesions. However, some data suggest that copper sulfate is rapidly neutralized by organic matter, so dirty footbaths will be less effective than clean ones. Copper sulfate concentration is recommended at two to five percent.

Formalin footbaths have many similar effects on hooves as copper sulfate. It kills bacteria, hardens the claw horn, and it is inexpensive. Bacteria do not develop resistance and formalin eventually breaks down into water and carbon dioxide. Research has shown that formalin footbaths reduce incidence and severity of hoof lesions and may retain its antibacterial activity for up to 330 animal passes. Typical formalin treatment concentration is three to five percent.

Using formalin requires additional precautions. Formalin is a suspected carcinogen and must be used in a well-ventilated area and requires additional safety

precautions for the person mixing the footbath solution. In addition, formalin may not be effective below 50 degrees Fahrenheit and may slow healing of open claw lesions when treated cattle are required to walk through footbaths. Formalin treatment concentration should be three to five percent. There is evidence demonstrating chemical burns in cattle caused by the use of formalin solutions in excess of five percent.

Zinc sulfate is another acceptable, yet less commonly used footbath solution. While research has not been widely conducted on controlling hoof skin lesions, anecdotal information suggests some success in controlling DD with the use of footbaths containing five to twenty percent zinc sulfate solutions. Like many other footbath solutions, zinc sulfate solutions have antibacterial properties, may also act as a hardening agent and are relatively inexpensive to use in footbaths. Unlike other footbath solutions, zinc sulfate has not been widely accepted because of difficulty dissolving in water. Poor solubility of zinc sulfate has prompted several companies to launch soluble zinc products for footbaths.



Properly maintained footbath solution should be deep enough to submerge the dewclaw and be monitored for cleanliness.

Premix solutions have varied concentrations depending on product type. Consult and follow mixing directions exactly how they are recommended. Premix solutions have been formulated and tested for best results. Determining one's own concentration rate will not make the product more effective, it could result in hoof damage and cost more to control DD.

Visit the University of Wisconsin School of Veterinary Medicine's Dairyland Initiative website to find the Footbath Dose Calculator at <http://thedairylandinitiative.vetmed.wisc.edu/>.

Treatment

Treatment frequency will vary depending on the herd. If experiencing an outbreak of DD, treat the herd starting three times a week. Monitor treatment results, and if DD is not improving, increase treatment to four to five times per week. Maintenance footbath treatments can be on a schedule such as Monday-Tuesday-Wednesday or Monday-Wednesday-Friday.

Design your footbath to allow cows to bypass treatment if needed. A simple chlorinated or soapy bath on non-treatment days can be used to manage foot cleanliness.

Footbath Solution Safety

Review the label and Safety Data Sheet (SDS) for safe use procedures during handling and mixing. If using formaldehyde, review OSHA formaldehyde standard for additional safety requirements.

Include chemicals in your Hazard Communication Program, consisting of inventory, SDS, and Personal Protective Equipment (PPE) selection of farm training procedures.

Train employees in safe mixing and handling, including cleaning the footbaths. In addition, train employees in the use of required PPE. Personal Protective Equipment training should cover proper donning and doffing, as well as cleaning and storage of PPE. Any chemicals requiring an employee to use a respirator, requires a respiratory program in training procedures.

"A one-size fits all footbath protocol does not exist. You need to bring down the prevalence of disease in the herd to a manageable state"

-Dr. Dörte Döpfer,
University of Wisconsin
School of Veterinary
Medicine

Acknowledgements

Dr. Dr. Dörte Döpfer—University of Wisconsin School of Veterinary Medicine
Cheryl Skjolaas—University of Wisconsin Center for Agriculture Safety and Health
Dr. Jan Shearer—Iowa State University

This 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

Tina Kohlman
UW-Extension Fond du Lac Co

Sarah Mills-Lloyd
UW-Extension Oconto Co

Greg Blonde
UW-Extension Waupaca Co

Darrell McCauley
UW-Extension Winnebago Co

Jamie Patton
UW-Extension Shawano Co

Scott Gunderson
UW-Extension Manitowoc Co

Zen Miller
UW-Extension Outagamie Co

Eric Ronk
UW-Extension Calumet Co

Olivia Hennes
UW-Extension Outagamie County Summer Intern

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 °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 to 15 °F, depending on variety and past management. Below this temperature, water left within

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

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 °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

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.

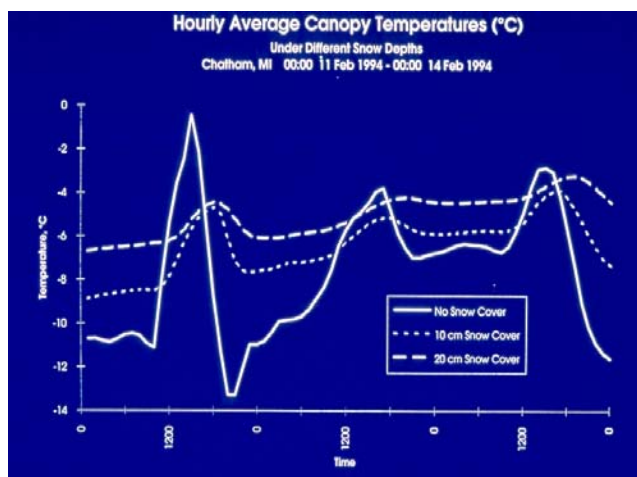


Figure 1. Effect of snow depth on soil temperature.

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:

$$\text{Yield (tons/acre)} = (\text{Stems/ft}^2 \times 0.1) + 0.38$$
For example, an alfalfa stand with 50 stems/ft² 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.

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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



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		
<i>Alfalfa variety total score (multiply a x b)</i>		
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:		
<u>Cut interval</u>	<u>Last cutting</u>	
<30 days	Sept. 1-Oct. 15	5
	After Oct. 15	4
	Before Sept. 1	3
or 30-35 days	Sept. 1-Oct. 15	4
	After Oct. 15	2
	Before Sept. 1	0
or >35 days	Sept. 1-Oct. 15	2
	After Oct. 15	0
	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