



DAIRY SOLUTIONS

SMART PRODUCERS, SMART SOLUTIONS

E-Newsletter

March 2017

Evaluating alfalfa stands for winter injury

Dr. Jon Pretz, Dairy Nutritionist, Hubbard Feeds

Every year in the upper Midwest, alfalfa fields are at risk for winter damage or kill due to extended cold temperatures and ice sheetings. Having the ability to evaluate your alfalfa fields for injury in early spring can ultimately jumpstart crop rotation decisions.

We have had a relatively mild winter in most of the upper Midwest, however, the lack of snow in most areas is a concern as alfalfa plants can potentially die if exposed to extremely cold temperatures. Typically, alfalfa plants can tolerate up to three weeks of winter injury before plants die. This window of time can vary due to soil temperatures with the window being smaller if soils are frozen and larger if soils are already at a higher temperature.

Factors that can affect alfalfa plant hardiness

- **Stand age:** older stands are more likely to winter kill than younger stands.
- **Soil pH:** soils with a pH above 6.6 are less likely to experience winter injury.
- **Soil fertility:** stands planted with high natural fertility are less likely to experience winter injury than those with low fertility.
- **Variety:** alfalfa varieties with superior winter hardiness ratings and a high disease resistance index are less likely to experience winter injury.
- **Cutting management:** harvest frequency and timing of fall cutting will affect alfalfa winter hardiness. Stands in which the last cutting is taken between September 1 and the middle of October are at greatest risk as plants have not had enough time to accumulate carbohydrate levels in the root system before winter.
- **Snow cover:** snow provides insulation to the plants and the crown. The crucial temperature region is two to four inches below the soil surface where a large part of the root structure is located. Stands that have at least six inches of stubble left will be able to retain more snow cover and be less susceptible to winter injury.

How to diagnose winter injury

- **Stands which are slow to green up:** Compare your stand to other fields in the area. If you notice great variation in your field with some green up and some areas still brown; it is time to further investigate the brown stands for injury or death.
- **Winter killed roots have a gray appearance:** Healthy roots should be firm and white in color as shown in figure 1. If the root is soft and darker, it is a possible sign of winter cold-related death.
- **Asymmetrical /uneven growth:** If asymmetrical growth is observed, a portion of the plant was likely winter-killed and only the healthy portion will be productive. If uneven growth is observed, a portion of the buds that were developed during the previous fall were likely injured and it will take time for those new buds to form thus resulting in shoots of different heights on the same plant.

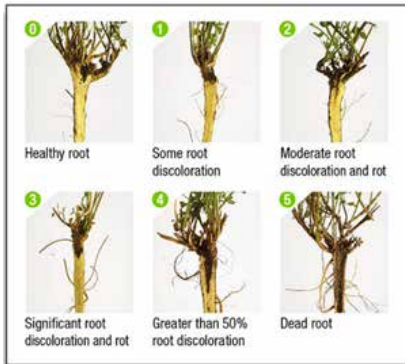
(continued on next page)



Hubbard Feeds
Mankato, MN
1.800.869.7219
www.hubbardfeeds.com



Figure 1.



Source: Alfalfa Management Guide, p. 43, 2000 by the American Society of Agronomy, Inc.; Crop Science Society of America, Inc.; and Soil Science Society of America, Inc.

Determine Yield Potential

Potential yield of an alfalfa field 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.

$$\text{Yield (tons/acre)} = (\text{Stems/ft}^2 \times 0.1) + 0.38$$

Example: An alfalfa field with 50 stems/ft² would have a yield potential of 5.38 tons/acre. Remember, this is potential yield. Soil factors, nutrient deficiency, insects, diseases and many other things may affect the actual yield. The following guidelines can be used to help decide on whether to keep or replace the alfalfa stand.

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

Quality forage is a critical component of a herd's nutrition program. Now is a good time to evaluate your alfalfa stand to determine, what, if any action needs to be taken.

Safety Message: Does your farm have a safety plan? Designate one person to this task. Hazard assessments, emergency procedures and communication methods should all be considered. On any farm, it's important to plan for safety.

Source: Cosgrove, D.C. and D. Undersander. 2003. Evaluating and Managing Alfalfa Stands for Winter Injury. Focus on Forage. Vol 5: No. 8.



Hubbard Feeds
Mankato, MN
1.800.869.7219
www.hubbardfeeds.com