



How do I diagnose winter injured Alfalfa?

- **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 the 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. 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.

My alfalfa stand is winter injured. Now what?

Winter injured stands require 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.

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

- If stands are have over 55 stems/ft² you have goods stands, no yield loss
- If stands are between 40 to 55 stems/ft² and under 4 years old consider adding Freedom Red Clover, Lofa or Perun Festolium, or Green Spirit Italian Ryegrass if the stand will be kept 2-3 years
- If stands are less than 40 stems/ft² rotate into a corn, spring annual or summer annual crop.



Evaluating Winter-Damaged Alfalfa Stands by Dennis Brown, CCA