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Abstract

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Evaluating Hay and Pasture Stands for Winter Injury

By Stephen K. Barnhart, Department of Agronomy

A grower has little control over climatic factors that influence winter injury, but understanding some management practices and winter weather characteristics may help to determine where winter injury risks are more likely.

Injury is more likely to occur on species and varieties with low inherent cold hardiness, such as alfalfa, birdsfoot trefoil, orchardgrass and the ryegrasses. Winterhardy species and varieties are less frequently injured.

Old alfalfa stands and plants weakened by disease are often more susceptible to winter injury. Young stands are less susceptible to winter injury.

Winter-Injury of alfalfa is less severe where a grass is present in the mixture.

Injury occurs more frequently where four summer-cuts were made or where a late fall cutting or grazing was practiced. Fall cutting or grazing may not allow accumulation of adequate carbohydrate reserves for the winter or leave stubble to catch snow.

Injury may be more severe where a good soil fertility program is not being followed.

Plants in areas with heavy ice cover, ponded and re-frozen ice, and where snow was absent during periods of extreme cold air temperatures are more vulnerable to winter injury.

Stand Evaluation

When evaluating winter injury, consider both the number of plants per square foot and the age of the stand. Crown and root diseases also have a major effect on stand reduction of legumes, so plants should be checked for dead, dying, or diseased tissue. Winter-injured plants are often slow to recover in spring, so a quick decision to destroy a winter injured stand is not recommended.

Alfalfa

Wait until the spring regrowth is about three to four inches high. Select random stand count sites. Check at least one 1-square-foot site for every five to ten acres. Dig up all of the plants in the 1-square-foot area. Pick at the crown and buds with a knife to determine if the tissue is still alive. Then count the number of live plants per square foot. Use Table 1 to begin your rating of the stand. Next, split the taproots and evaluate their general health. The core of healthy taproots is firm and creamy-white. Damaged or dying taproots are yellowish-brown to chocolate-brown in color and watery or dry and fibrous in texture. Only healthy plants will contribute significantly to yield, so if any of the taproots are more than 50 percent diseased, reduce your initial stand count

accordingly.

Table 1

Age of stand and rating of winter survival			
	<u>Good</u>	<u>Marginal</u>	<u>Consider Reseeding</u>
	Plants per square foot		
Year after seeding	+12	8 to 12	less than 8
2	+ 8	5 to 6	less than 5
3**	+ 6	4 to 5	less than 4
4 and older **	+ 4	3 to 4	less than 3

** Alfalfa plants in thin stands often produce more individual stems per plant and compensate some in yield potential*

*** If 50 percent or more of the plants have crown or root rot, consider reseeding.*

Plan your management this season, based on your stand evaluation.

If stands are winter-injured, but will be harvested this season, allow plants to mature longer before cutting. Allowing plants to develop to early, mid or even full bloom in a growth cycle will help the plants restore carbohydrates and vigor needed for subsequent production. It is best to allow plants in severely injured stands to go to nearly full bloom in first cut, and to early flower in subsequent cuttings. This gives weakened plants a chance to regain some vigor. Stands with less injury could be harvested somewhat earlier depending on the extent of the injury. If stands were only mildly injured allow at least one growth cycle during the season to go to 10 to 25 percent bloom. Most producers will choose second or third cutting to take advantage of the generally larger yield of the first cutting.

Increase cutting height. As the maturing stems are flowering, new shoots may be growing 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.

Maintain good fertilizer and insect management. It is particularly important that winter injured stands have adequate fertility. Soil test and apply needed fertilizer prior to first cutting if possible. And, be particularly vigilant in your insect scouting and management during the growing season following winter injury.

Pastures

Evaluate other legumes similar to alfalfa. The ability of red clover, white clover and birdsfoot trefoil to reseed may compensate for some stand loss. Sod-forming grasses, such as smooth bromegrass may spread and fill in for thin stands. But, bunch-type grasses, such as orchardgrass and timothy will not. For a legume in a legume-grass mix, consider the "marginal" values given in Table 1 as "good". While nitrogen fertilizer may help in the recovery of severely injured grass pastures, avoid using excessive nitrogen rates and be ready to manage weeds in these less competitive stands.

Reseeding in hayfields or pastures might be a viable option. **Reseeding more alfalfa into or immediately after a 2-year old or older stand is not recommended.** Overseeding or drilling grasses or red clover into thin or winter damaged stands should be done from now through April. Delaying seeding until later in the spring increases the risk of plant competition and seedling loss to increasingly dry and hot soil surface conditions of early summer.

Iowa State University Extension publications for further information

[Evaluation for winter injury](#), PM 1365

[Selecting forage species](#), PM 1792
[Establishing new forage stands](#), PM 1008
[Interseeding and no-till renovation](#), PM 1097

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