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Management tips for drought-stressed forages

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The Midwest U.S. has seen some of the most extreme drought conditions of recent memory. Some rain has come recently for most of this area, but not enough for most of us to feel comfortable about. Pastures may still be in poor condition. Many hayfields had enough regrowth that a late fall cut was taken. Regionally, hay supplies are tight and prices are high. Forage management considerations are many. Here are some things to think about as you prioritize you options.

Hay and pastures: The goal is to help keep perennial forage plants 'perennial'

Most of our well-adapted, perennial forage grasses and legumes will survive the winter, even if they were stressed during the past summer and mismanaged in the fall. During the fall weeks, perennial forage legumes and grasses respond to shortening days and cooling average daily temperatures and progress through their gradual "cold hardening" process. The genetics of the variety and local climatic conditions determine how cold tolerant the plant crown and taproot can be during the winter months. Most successfully winterhardened perennial forage legumes and grasses can withstand soil temperatures in the crown area to about 0 to 4 degrees F without crown tissue damage. At lower soil and crown temperatures, varieties and individual plants will vary in the degree of cold damage they may experience.

To best acquire their potential for winter survival, perennial forage plants should get 5 to 6 weeks of uninterrupted growth to accumulate root carbohydrates and proteins before a fall 'killing freeze' and winter dormancy. It is difficult to define when the plants are actually dormant, but a season-ending, 'killing freeze' is usually a cold night of about 23-24F for several hours.

If you did cut one more hay cutting or grazing, it is important to manage fall harvests or grazings to give the plants the best chance for strong winter survival. Leaving a 5-6 inch stubble and any continued growth after the late cut will help to catch snow and maintain better crown insulation.

The same goes for late season growth management of pastures. Try to allow 3 to 4 weeks of fall recovery before a killing freeze, and then, if you are going to graze again, leave an average of 3 inches or so of lower stem bases on the grasses.

Stand evaluation

When evaluating winter injury in alfalfa fields, consider both the number of plants per square foot, the age of the stand. Crown and root diseases develop as stands age and often reduce stand density. So, plants should also 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.

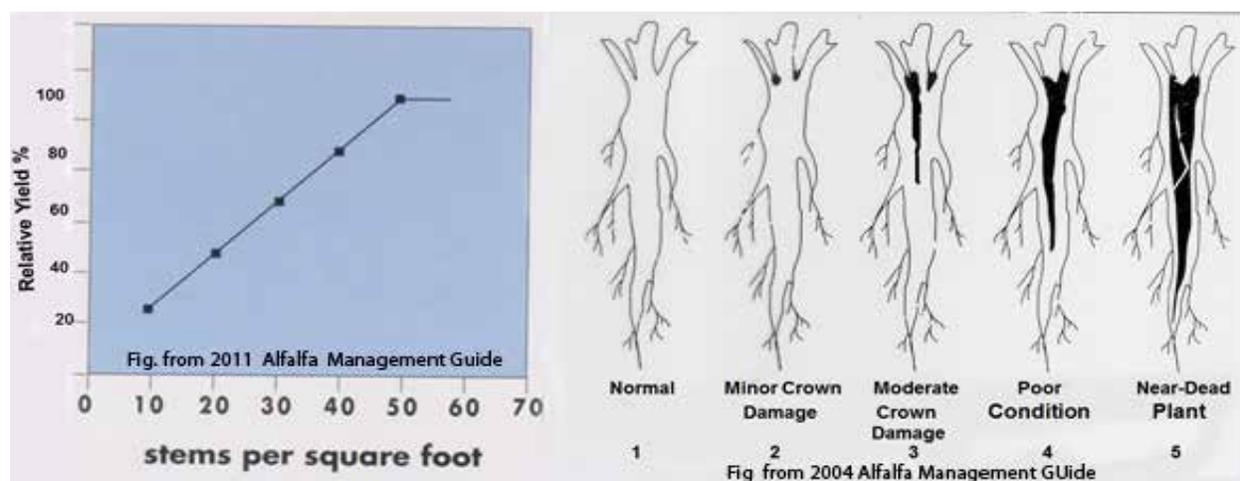
Wait until the spring regrowth is about 3 to 4 inches high. Select random stand count sites that represent the variability of the field. Check at least one 1-square-foot site for every 5 to 10 acres. Dig up all of the plants in the 1-square-foot area. Pick at the crown and buds with a knife to determine 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. See Figure 2. The interior 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.

	Good	Marginal¹	Consider reseeding
	----- plants per square foot -----		
Year following seeding	> 12	8 - 12	< 8
2 years	> 8	5 - 6	< 5
3 years	> 6	4 - 5	< 4
4 years and older ²	> 4	3 - 4	< 3

¹ Alfalfa plants in thin stands often produce more individual stems per plant and compensate some in yield potential

² If 50 percent or more of the plants have crown or root rot, consider reseeding.

**Figure 1.** Stems per square foot assessment.**Figure 2.** Evaluate general 'health' of taproots.

Alternatively, use the 'stems per square foot assessment method'. See Figure 1. It takes about 55 or more stems per square foot to indicate that 'stand density' is not limiting yield. Also use Figure 2 to evaluate general 'health' of taproots with the 'stems per square foot' assessment method. Whether using 'plants/square foot' or 'stems/square foot' and adjust stand assessment as needed.

When evaluating stands for other forage legumes such as red clover, use the same general guidelines as were used for alfalfa. Grasses are not as easily identified as individual plants or tillers, so use a general assessment of % ground cover of recovering grasses, and their general vigor. Pasture areas with greater than 70 percent live sod cover are most desirable. With less than 70 percent sod cover, consider frostseeding or interseeding, as describe in the reference publications. Winter-injured pasture plants are often slow to recover in spring, so a quick decision to destroy a winter injured stand is not recommended

Plan your management this season, based on your stand evaluation. Hay fields and pastures that do survive the winter in a weakened condition will benefit from a less-than-normal use pressure during 2013.

- If stands are winter-injured, but will be harvested this season, allow plants to mature to 10 to 25% bloom or later, before cutting.
- Increase cutting height to 3 to 4 inches
- Maintain good fertilizer and insect management
- If stands are severely winter injured, and you will incur a significant loss in 2013, plan to reestablish a new hay field this spring, and begin to plan for any needed supplemental harvested and stored forage needs until the new seeding becomes adequately productive.

Repairing and reseeding

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

Consider 'interseeding' or 'frostseeding' drought-thinned pastures next late winter or early spring. Frostseeding is the broadcasting of legumes or additional grass seed in late winter when the last few weeks of night-freeze and daytime-thaw, and the first few weeks of early spring rain splash aid in seed coverage. Interseeding is using a drill to no-till legumes or forage grasses into an existing sod. Spring interseeding dates are mid-March through late-April.

Frostseeding works best with legumes on the thinnest, least competitive sod areas. Grasses are generally more effectively established with interseeding than with frostseeding. With both frostseeding and interseeding, having the existing pasture sod grazed closely (like many of our pastures following the summer drought stresses) reduces early season competition. Further competition for shade sunlight and soil moisture can be reduced by timely and thoughtful rotational grazing for the first few months of new seedling establishment. More details about these establishment methods and suggestion for their success are listed in the 'Reference' section for this article.

Fertilization

Fall is a good time to soil test and fertilize both hay and pastures with needed potassium (K) and phosphorus (P). This will help drought-stressed forage stands to overwinter and improve regrow and yields next spring. Applying 25 to 40 lbs of nitrogen to grass pastures during the last few weeks of their fall growth will aid in stimulating more fall tillering (branching) and for more vigorous recovery in the spring.

Give recovering hay and pasture stands time to 'catch up' or regain more vigor next spring

If fall recovery was not favorable, or you did cut or graze late in the season in 2012, the recovering forage plant may still be under some physiological stress. Hay and pasture plants will benefit from allowing a bit more recovery and growing time next spring before they are cut or grazed. For best 'recovery management' delay the first cut of alfalfa stands until they reach early- to mid-bloom. For pastures, allow 3 to 4 inches of growth in the spring before livestock turnout.

References

- Alfalfa Management Guide. 2011. D. Undersander, et.al. American Society of Agronomy, Madison, WI.
- Establishing new forage stands <http://www.extension.iastate.edu/Publications/PM1008.pdf>
- Evaluation for winter injury <http://www.extension.iastate.edu/Publications/PM1362.pdf>
- Interseeding and No-till renovation <http://www.extension.iastate.edu/Publications/PM1097.pdf>
- Selecting forage species <http://www.extension.iastate.edu/Publications/PM1792.pdf>