Plan to Scout Alfalfa Stands for Winter Survival

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Abstract
A warm weather pattern in late February caused soil temperatures across most of Iowa to rise above 40 degrees Fahrenheit (F). This warm period was likely long enough for alfalfa and some forage grasses (most ryegrass varieties and less winter-hardy orchardgrass and tall fescue varieties) to break dormancy. When low temperatures resume, alfalfa plants can reharden to a degree, but only to the extent that it still has stored carbohydrates available. Winter injury occurs either when frequent warm-cold cycles deplete carbohydrates, or if the temperature drops so rapidly that the plant does not have time to sufficiently reharden.

Disciplines
Agricultural Science | Agriculture

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March 13, 2017

A warm weather pattern in late February caused soil temperatures across most of Iowa to rise above 40 degrees Fahrenheit (F). This warm period was likely long enough for alfalfa and some forage grasses (most ryegrass varieties and less winter-hardy orchardgrass and tall fescue varieties) to break dormancy. When low temperatures resume, alfalfa plants can reharden to a degree, but only to the extent that it still has stored carbohydrates available. Winter injury occurs either when frequent warm-cold cycles deplete carbohydrates, or if the temperature drops so rapidly that the plant does not have time to sufficiently reharden.

When dormant, alfalfa crowns can tolerate soil temperatures of 5 to 10 degrees F, below this tissue damage could begin to occur. After breaking dormancy, tissue damage could theoretically start to occur at less than 28 degrees F, but more would not occur until soil temperatures reach the mid-20’s degree F. If shoot development occurred with a break in dormancy, and the current air temperatures are cold enough to freeze these shoots, the plant can initiate new shoots as long as sufficient carbohydrates are available. As carbohydrates are depleted, tissue damage will occur. If too much damage occurs before the plant can initiate photosynthesis and replace carbohydrates, the plant will not recover.

Seasonal alfalfa management influences how well plants store carbohydrates entering winter. These factors include variety selection (winter survival index, disease resistance, fall dormancy level), age of stand, soil fertility, pest management, soil drainage, soil moisture in fall (higher soil moisture in fall tends to reduce alfalfa hardiness for the winter), cutting schedule intensity (how much stress was put on the stand), was there a late fall cut or not, and if cut late was there fall stubble left or not. These factors influence how healthy the stand enters into the winter, thus winter injury conditions between and within fields can vary considerable.
The current cold front may cause some wide-scale problems with alfalfa, but the extent of damage can only be determined with scouting fields. Begin by digging plants about a week after the cold front passes. This will provide time for symptoms to develop on crown tissue: firm tissue is good, soft tissue is not. If damage is due to the recent cold weather there should not be any visual tissue discoloration yet (first off-yellow, then tan in color) since it’s too soon after the freeze damage. If the crown tissue is discolored and soft to mushy, damage to the plants likely occurred weeks ago. If crown tissue is dead and drying out, damage to the plants occurred at least a month ago. Most plants in older stands will also exhibit some dark colored crown rot in the center of the crown, which is normal. Ignore this and evaluate the white tissue surrounding this area. Check the illustrations in the resource A3620 mentioned below to assist in your assessment of the stand.

It is impossible to predict the impact of this winter's fluctuating temperatures without scouting fields. The following resources can assist managers in conducting alfalfa stand assessments, as well as planning livestock forage inventory and considerations for forage replant options, if it comes to that.

- University of Wisconsin A3620, “Alfalfa stand assessment: Is this stand good enough to keep?”
- University of Minnesota article regarding alfalfa winter injury, forage inventory for livestock, and forage replant options: "Winter injury of alfalfa: putting the pieces together for livestock producers".
- ICM News article discussing forage replant options: "Adapting to Alfalfa Winterkill and Winter Injury".

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Category: Crop Production
Crop: Biomass and Forage
Tags: alfalfa winter survival dormancy
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Brian Lang conducts Iowa State University Extension and Outreach programs in crop production and protection in northeast Iowa. Frequent clients include farmers, ag chemical and fertilizer dealers, seed dealers, crop consultants, and farm managers. Provide timely in-season crop management inform...