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Assessing freeze damage to alfalfa and management suggestions

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Assessing freeze damage to alfalfa and management suggestions

Abstract

An unprecedented period of sub-freezing temperatures in early April 2007 across the upper Midwest states has raised questions about possible cold injury to forage crops. It has been obvious that new spring regrowth of alfalfa and some clovers has been frozen. The unknown at this time is whether there has been any lasting damage to alfalfa, clovers, or orchardgrass crowns and roots. Early indications are that there has not been widespread winterkill.

Keywords

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Struggling alfalfa fields:

Assessing freeze damage to alfalfa and management suggestions

by Steve Barnhart, Department of Agronomy

An unprecedented period of sub-freezing temperatures in early April 2007 across the upper Midwest states has raised questions about possible cold injury to forage crops. It has been obvious that new spring regrowth of alfalfa and some clovers has been frozen. The unknown at this time is whether there has been any lasting damage to alfalfa, clovers, or orchardgrass crowns and roots. Early indications are that there has not been widespread winterkill.

The best management suggestion at the moment is to wait a few more days to see what the damage may be in individual fields.

Short-term evaluation and management suggestions

Established frost injured alfalfa stands

- If cold injury to established stands was "light," only affecting some of the early topgrowth, determine if the growing point of the stems has been damaged. If there was only leaf damage and the stem tip is recovering normally, follow your normal harvest plans.
- If the stem tips are permanently damaged, more branches will likely form from the base of the plant. Conflicting suggestions have been made on the desirability to chop or shred the frosted stems. The consensus seems to be that if the frosted stems were less than 10 inches tall at the time of frost, don't attempt to cut or chop them down. Recovering, frosted plants are regrowing from a reduced state of physiological vigor, so they will develop more slowly than in a normal spring period. The recommendation that is best for the recovering plants is to harvest a week or so later than normal in late May or early June.
- It is strongly recommended to dig some random plants several times over the next two weeks to evaluate the condition of the plant crowns and taproots. When looking at dug plants, first check for the presence of green, growing new stems. If no new regrowth is present, "pick" at buds on the crown to detect if they are still firm and appear to be living tissue. (They may just be slow to emerge.) Split the taproots. Healthy taproots are creamy-white in color with a firm texture. Freeze-injured taproots will begin to be "watery," tan/brown in color and beginning to soften. Pay particular attention to the upper inch of the taproot that may have experienced the coldest temperatures.
- If evidence of crown and taproot freezing is widespread in older stands, consider replanting a new alfalfa stand in an adjacent field.

New seedlings

Alfalfa and clover seedlings can survive tissue temperatures a few degrees colder than leaf tissue on stems of recovering plants. If new seedlings were permanently damaged, consider reseeding as soon as possible. Keep the good areas and drill into thin or damaged areas.

Tillage may not be necessary. If a cereal grain companion crop is still present, will be too

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competitive, or will impede the reseeding, then tillage may be required.

Orchardgrass also can be frost injured. New growth is often slow and will be seen as new side tillers (leaves) growing on the outer edges of the orchardgrass plant clumps.

Longer term forage management considerations for alfalfa stands

These considerations are for those damaged or questionable "thin" stands.

After there is about 6 inches of viable new shoot growth, take stem counts in several places in each field. Fewer than 40 stems per square foot indicates a low, noneconomic yield potential stand. If stem counts average 40 to 55 per square feet, the stand will likely produce less-than-full yields. An average of more than 55 stems per square foot indicates that the stand is at full production potential.

How much do you need forage from low-yield or questionable fields? If high quality hay or haylage inventories are low, stands that appear somewhat questionable may be worth keeping at least for a first cutting.

If a decision is made to terminate the stand either now or after one cutting, plan to follow with a grass-type crop that can benefit from the free fixed nitrogen left behind by the alfalfa. Corn for silage is generally the highest tonnage option. An oats, barley, or spring triticale "for forage" also may be a short-term supplemental forage alternative. Small grain-pea mixtures (if peas are affordable and planting can be done early) also can provide good quality forage within two months after planting. Traditional summer annual "emergency" forage crops, such as sudangrass or one of the millets, are season-long options but still a month or so away from their proper seeding dates (mid-May).

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Photo. by John Kenniker

Forage crops recently suffered cold injury. (John Kenniker)



Healthy taproots are creamy-white in color with a firm texture. (ISU Extension)

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