

4-9-2012

Cold Injury to Alfalfa

Stephen K. Barnhart

Iowa State University, sbarnhar@iastate.edu

Follow this and additional works at: <http://lib.dr.iastate.edu/cropnews>

 Part of the [Agricultural Science Commons](#), [Agriculture Commons](#), and the [Agronomy and Crop Sciences Commons](#)

Recommended Citation

Barnhart, Stephen K., "Cold Injury to Alfalfa" (2012). *Integrated Crop Management News*. 175.
<http://lib.dr.iastate.edu/cropnews/175>

The Iowa State University Digital Repository provides access to Integrated Crop Management News for historical purposes only. Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user. Users should make their own assessment of the information and whether it is suitable for their intended purpose. For current information on integrated crop management from Iowa State University Extension and Outreach, please visit <https://crops.extension.iastate.edu/>.

Cold Injury to Alfalfa

Abstract

Alfalfa fields are growing well across most of Iowa. The next few nights have frost or freeze warnings, with predictions of night low temperatures as low as low 20s. Low temperatures, whether visible frost is present or not, may affect the growth of both established forage plants, as well as newly emerged seedlings.

Keywords

Agronomy

Disciplines

Agricultural Science | Agriculture | Agronomy and Crop Sciences

Subscribe to Crop
News

Archives

[2014](#)

[2013](#)

[2012](#)

[2011](#)

[2010](#)

[2009](#)

[2008](#)

[Previous Years](#)

ISU Crop Resources

[Extension Field
Agronomists](#)

[Crop & Soils Info](#)

[Pesticide Applicator
Training](#)

[Agronomy Extension](#)

[Entomology Extension](#)

[Plant Pathology
Extension](#)

[Ag and Biosystems
Engineering Extension](#)


[Agribusiness
Education Program](#)


[Iowa Grain Quality
Initiative](#)

[College of Agriculture
and Life Sciences](#)


[ISU Extension](#)


Integrated Crop Management NEWS

 PRINT STORY

 EMAIL STORY

 ADD TO DELICIOUS

 ATOM FEED

 FOLLOW ON TWITTER

Cold Injury to Alfalfa

By Steve Barnhart, Department of Agronomy

Alfalfa fields are growing well across most of Iowa. The next few nights have frost or freeze warnings, with predictions of night low temperatures as low as low 20s. Low temperatures, whether visible frost is present or not, may affect the growth of both established forage plants, as well as newly emerged seedlings.

Cold injury risk is reduced where vegetative growth or cover is protecting the new seedlings or forage growth lower in the plant canopy. Air temperature, a few feet above a bare or grass covered soil surface, is what is measured and reported. Plant tissue temperature is influenced by leaf surface color, density of the plant canopy, air movement within the canopy, the temperature of the soil, and likely more subtle conditions. The air within the forage canopy is likely 'layered', meaning the temperature at the top of the canopy is colder than the temperature at the soil surface, and below the soil surface in the taproot and crown area. Simple statements about the influence of the reported temperature can be misleading. To complicate things a bit more, tolerance of leaves to frost varies somewhat among varieties and individual plants, and is not always related to winter hardiness of the variety.

New Forage Seedlings

At emergence, alfalfa and most winter hardy forage grass and legume seedlings have good cold tolerance. But, spring cold snaps can hurt new seedlings too. I tend to agree with the article from Oregon that states; "For alfalfa, at second trifoliate leaf stage (and older) seedlings become more susceptible to cold injury and may be killed by four or more hours at 26 F or lower temperatures. Alfalfa seeded with a companion crop survives lower temperatures and longer exposure times before showing frost damage."

Established Stands

Well established, developing forage plants have lost their winter cold hardiness. Exposed tissue is susceptible to cold temperature injury. Several hours of 25-27 F temperature, or lower, will damage leaf tissue and may seriously damage buds and growing points. Upper 20s F air temperatures will likely damage one to several sets of trifoliate leaves that were exposed at the top of the canopy. The buds and growing stem tips are somewhat more protected and often continue to grow normally.

Where does that leave us? There will likely be leaf tissue damage in some parts of the state where overnight temperatures go 25 F to 27 F or lower for several hours. Slope position, soil temperature, companion crop of oats, wind, snow cover, all will influence what occurs in a particular field or part of a field.

Management Suggestions

The only management suggestion at the moment is to wait a week or so to see what the damage is.

New seedlings

Seedlings that were frozen so that all trifoliate leaves are discolored and

dying will not regrow. If new seedlings were permanently damaged, consider re-seeding as soon as possible. Keep the good areas and drill into thin or damaged areas. Tillage may not be necessary. If you think that a cereal grain companion crop, still present, will be too competitive or will impede the reseeded, then tillage may be required.

Established stands

A "light" frost/freeze where temps don't go below around 27 F or so for very long is likely to freeze several sets of trifoliate leaves on the alfalfa tops and set back growth rates for a while, but plants will grow out of it. No need to cut, although some growers seeking very high quality might do so if standing yield is high enough to justify harvest with the understanding that plants will be weakened by early cutting and should be allowed extra time to recover before the next cutting.

A freeze that penetrates about halfway down into the alfalfa canopy will likely kill the top-most stem tip/growing points. These plants will continue to grow too, producing more branching below the freeze zone; others may produce new stems from below ground, crown buds. This kind of regrowth will be slow to initiate. If yield is high enough to justify harvest, and plants have reached 15 to 20 inches of height or bud stage, the stands probably should be cut, knowing that extra time will be needed for recovery before the next cutting. If yield of standing crop is low, or the plants weren't nearly ready to cut, probably best to just wait out the delay in regrowth. It will be hard to justify the time and expense of cutting/shredding with no immediate harvestable crop.

A colder, freeze likely will freeze plants all the way to the ground and kill the above ground stems. April frosts and freezes are not likely to be cold enough to damage underground crowns, so the plant is not dead. Harvest of frozen plants is warranted if yield is sufficient, but must be done immediately. If frozen plants collapse much of the biomass will be lodged. Frozen leaves will shatter quickly from stems as they dry, so good handling and harvest management is needed to salvage the forage. If you are not going to harvest this frozen plant material, there is no benefit from shredding damaged tissue, the new stems will grow up through the frosted, lodged stems.

After a freeze that causes visible damage to alfalfa tissue, the plants are under some stress, and will be more susceptible to damage from foliar diseases and sometimes, insects, on regrowth, so continue scouting fields.

Replanting severely damaged new seeding may be necessary. If there has been widespread, severe cold injury to established stands, consider replanting a new alfalfa stand in an adjacent field.

Steve Barnhart is a professor of agronomy with extension, teaching, and research responsibilities in forage production and management. He can be reached at sbarnhar@iastate.edu, or 515-294-7835.

This article was published originally on 4/9/2012. The information contained within the article may or may not be up to date depending on when you are accessing the information.

Links to this material are strongly encouraged. This article may be republished without further permission if it is published as written and includes credit to the author, Integrated Crop Management News and Iowa State University Extension. Prior permission from the author is required if this article is republished in any other manner.