

3-20-2019

## Alfalfa Winter Survival - A Complicated Subject

Brian J. Lang

Iowa State University, [bjlang@iastate.edu](mailto:bjlang@iastate.edu)

Rebecca K. Vittetoe

Iowa State University, [rka8@iastate.edu](mailto:rka8@iastate.edu)

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



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

---

### Recommended Citation

Lang, Brian J. and Vittetoe, Rebecca K., "Alfalfa Winter Survival - A Complicated Subject" (2019). *Integrated Crop Management News*. 2523.

<https://lib.dr.iastate.edu/cropnews/2523>

**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 Users are hereby notified that the content may be inaccurate, out of date, incomplete and/or may not meet the needs and requirements of the user.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/>.**

---

# Alfalfa Winter Survival - A Complicated Subject

## **Abstract**

How did alfalfa fields fair this past winter? This is a complicated subject since several factors play into alfalfa winter survival. These factors include fall soil moisture conditions, 4-inch soil temperature, and other stresses like stand age, soil fertility, and fall stubble.

## **Disciplines**

Agricultural Science | Agriculture

# IOWA STATE UNIVERSITY

## Extension and Outreach

Integrated Crop Management

# Alfalfa Winter Survival - A Complicated Subject

March 20, 2019

---

How did alfalfa fields fair this past winter? This is a complicated subject since several factors play into alfalfa winter survival. These factors include fall soil moisture conditions, 4-inch soil temperature, and other stresses like stand age, soil fertility, and fall stubble.

## Fall soil moisture conditions

Fall of 2018 was extremely wet across Iowa, ranking as the 3<sup>rd</sup> wettest fall on record. A wet fall contributes to two potential complications for alfalfa survival.

Alfalfa cannot tolerate saturated soils for extended periods of time. Low areas and hill-side seeps were saturated for a time in fall and nearly saturated entering winter. Additionally, under normal fall conditions adapted alfalfa varieties harden down to tolerate winter-time 4-inch soil temperatures of 15 F or less (generally defined range of 5-15 F) before damage to crown tissue would occur. However, during wet falls, this hardening-down ability is reduced. This situation adds to the list of other potential stress factors mentioned below that also influence alfalfa winter survival.

Another factor related to soil moisture and alfalfa winter survival is the soil air space. Soil with air spaces is a better insulator than soil with those air spaces filled with water. The air spaces also allow the soil to “breathe”, which helps to avoid the buildup of toxic metabolites from overwintering alfalfa. Thus, saturated soils having little to no air space is not all that different from an anoxia zone caused by ice sheets above ground.

## 4-inch soil temperatures

Winter-time 4-inch soil temperatures across Iowa are usually in the range of the upper 20's to mid-30's. Thus, most winters offer little threat to alfalfa crown damage by cold soil conditions alone. Snow cover adds a highly significant insulation factor, providing significant protection from even below zero air temperatures. However, a lack of snow cover during periods of frigid air temperatures can be very stressful for overwintering plants. A couple of very cold days in late January caused 4-inch soil temperatures to drop down to as low as 17 F at some weather station locations across northern Iowa.

## Other stresses

Other stresses that could impact winter survival of alfalfa include: stand age, variety winter hardiness and disease resistance, soil pH, soil potassium level, soil drainage, harvest schedule, and fall stubble. The University of Wisconsin has a good publication, ["Evaluating and managing alfalfa stands for winter injury"](#), that explains the impact these other stresses can have on alfalfa winter injury in more detail.

*Note: In this article, the optimum soil K level is specific for Wisconsin and not Iowa. Use ISU's optimum soil K level of 161-200 ppm (Melich-3 or  $\text{NH}_4^+$ -acetate) instead of the 120-160 ppm (Bray-1 K) that is listed in the article. Also, the article mentions that stands with a last cutting between Sept. 1 and Oct. 15 are at greater risk for winter injury since they are unable to replenish their root carbohydrate reserves before winter. Use Sept. 10 and Oct. 20 for northern Iowa and Sept. 15 and Oct. 25 for southern Iowa.*

As alfalfa fields green-up this spring, winter survival issues will be obvious by corn planting time. However, some stand assessments may need to occur prior to this green-up to ensure adequate forage for this year. To assess stands in these situations, check out ["Alfalfa stand assessment: Is this stand good enough to keep?"](#). If replant considerations are necessary, check out this ICM Article ["Adapting to Alfalfa Winterkill and Winter Injury."](#)

**Category:** [Crop Production](#)

*Links to this article are strongly encouraged, and this article may be republished without further permission if published as written and if credit is given to the author, Integrated Crop Management News, and Iowa State University Extension and Outreach. If this article is to be used in any other manner, permission from the author is required. This article was originally published on March 20, 2019. The information contained within may not be the most current and accurate depending on when it is accessed.*

**Crop:**

## Biomass and Forage

**Tags:** alfalfa winter injury winter survival

### **Authors:**



Brian Lang *Field Agronomist in NE Iowa*

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...



Rebecca Vittetoe *Field Agronomist in EC Iowa*

Rebecca Vittetoe is an extension field agronomist in southeast/south central Iowa. Educational programs are available for farmers, agribusiness, pesticide applicators, and certified crop advisors.

Areas of expertise include agronomy, field crop production and management of corn, so...