

# THE FORAGER

*Agronomics with livestock in mind!*

## ***We Can Reduce Risk of Alfalfa Winterkill***

Alfalfa is an expensive crop to establish and manage, but it is also a very important forage crop, particularly for dairy operations. Finding winter injury or winterkill to alfalfa in the spring can be discouraging to producers trying to meet the nutritional requirements of the herd. This article discusses: 1) what causes alfalfa winterkill; 2) factors affecting alfalfa winterkill; and, 3) possible ways of reducing the risk of alfalfa winterkill.

- 1. What causes winterkill?** Alfalfa will tolerate temperatures as low as 5-15° F, depending on variety, soil characteristics (i.e., soil pH, soil fertility, and soil moisture), stand age, and past management practices. Below this temperature, water left within the alfalfa taproot cells freezes and forms ice crystals that puncture the cell membranes. When the alfalfa roots thaw, the plants die because water and cell contents leak from the cells. Freezing rain and thawing in late winter can be particularly lethal to alfalfa.
- 2. What are the factors affecting alfalfa winterkill?**
  - Snow cover: temperature fluctuations and risk of heaving occur much less under snow cover, resulting in less freezing damage to cells and plant death. Snow cover insulates the soil and reduces winter injury to alfalfa crowns. One practice that will result in more snow cover is to leave extra stubble during a fall cutting.
  - Ice sheeting: one of the most risky factors affecting alfalfa winterkill is ice sheeting. In the winter or early spring, rainfall or the fast melting of snow followed by cold temperatures can result in ice sheeting that smothers alfalfa stands. Ice sheeting also freezes alfalfa due to the poor insulating property of ice.
  - Cutting management: frequent cuttings weaken and put stress on alfalfa that can increase winter injury and reduce stand longevity. Alfalfa plants need to have enough rest time between cuttings to re-build food reserves in the crown which are used for regrowth after each cutting and in early spring. In particular, harvesting during “critical late summer and fall periods” can damage alfalfa stands.
  - Soil fertility: alfalfa requires a soil pH greater than 6.5. A soil pH of less than 6.0 can put alfalfa stands at greater risk of winterkill because of poor plant growth and reserves. In particular, potassium plays a key role in winter survival and low potassium levels in soil can limit the plant’s ability to store root reserves. Keep fertility levels medium- to-high, as alfalfa removes 50 lb K<sub>2</sub>O/ton dry matter.
  - Soil drainage: heaving takes place on fine textured soils with poor internal drainage, since freeze/thaw cause the alfalfa tap root to be pushed out of the soil. When heaving is more than 1”, alfalfa crowns will be elevated, causing them to dry out, breaking taproots and lateral roots. Improving poor drainage in alfalfa fields can be a challenge

*(continued in next column)*

- due to the high cost for installing drainage. Locate alfalfa fields where internal/surface drainage are good.
- Winter hardiness of varieties: varieties can make a difference in terms of winter survival and further stand persistence, so choose varieties with high winter hardiness. In addition, disease resistant varieties have better winter survival.
- Deer damage: deer can seriously damage alfalfa stands by eating the alfalfa crown areas, thereby making them more susceptible to winterkill. Not many options are available to prevent the alfalfa damage from deer. Fencing can be one of the most effective ways to reduce deer damage, but can be expensive.

### **3. How can the risk of alfalfa winterkill be reduced? The following management options can help.**

- Leave higher cut stubble, up to 6” from the last cutting, to trap snow for insulation.
- Improve surface/internal soil drainage or select fields that have better drainage to grow alfalfa.
- Adjust soil pH close to neutral (pH 6.5 – 7.0) before establishing alfalfa stands.
- Maintain an optimum potassium level in the soil (200–250 lb K/acre or 100–125 ppm K).
- Plant winter hardy varieties.
- Avoid frequent cuttings and use the latest recommendations for fall cutting of alfalfa.
- Include a perennial cool-season grass in alfalfa to reduce winter injury risks.

*(Edited from an article by Doo Hong Min/Rich Leep, Mich. State U)*

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