Scouting and Managing for Winter Injury in Alfalfa

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Scouting and Managing for Winter Injury in Alfalfa

Abstract
Reports of winter injury in alfalfa fields are coming in across the state. Old man winter along with other management factors can take a toll on alfalfa stands. Older stands, stands that were harvested between mid-September and late October, and stands with minimal stubble appear to have suffered the worst winter injury. Additionally, in many fields it is obvious where the snow drifted and provided insulation and protection as those parts of the field are the greenest. Below are issues observed in alfalfa fields across the state along with resources on how to manage fields with winter injury.

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Scouting and Managing for Winter Injury in Alfalfa

April 17, 2019

Reports of winter injury in alfalfa fields are coming in across the state. Old man winter along with other management factors can take a toll on alfalfa stands. Older stands, stands that were harvested between mid-September and late October, and stands with minimal stubble appear to have suffered the worst winter injury. Additionally, in many fields it is obvious where the snow drifted and provided insulation and protection as those parts of the field are the greenest. Below are issues observed in alfalfa fields across the state along with resources on how to manage fields with winter injury.

Winter Injury Observations:

Alfalfa field not evenly greening up due to winter injury.
• **Low spots.** Alfalfa does not tolerate wet soils for too long, so some stand loss often is apparent in low areas. With a wet fall and a wet start to the spring between snow melt and rain, it’s not surprising to see this. Field drainage and time play an important role in why some low areas are fine and some are not.

• **Heaving.** The very wet fall conditions and going into the winter with full soil moisture profiles also enhanced the chance for frost-heave injury to alfalfa. Just like paved streets can heave and settle back down in the winter due to the winter freeze, so can alfalfa plants. This heaving action can be strong enough to snap taproots. Sometimes the alfalfa completely moves with the soil, and sometimes the alfalfa does not completely settle back down, especially when the taproots were snapped. When this happens some of the crown is exposed above the soil surface. If this happens too early in winter, the exposed crown tissue will be killed by the cold winter temperatures. If this happens late enough in winter/spring, the exposed crown *may* still survive for another season if the cutting height is above the crown. However, the plant will winterkill next winter when the raised crown is exposed to the winter temperatures.

![Alfalfa plants that died due to heaving.](https://crops.extension.iastate.edu/cropnews/2019/04/scouting-and-managing-winter-injury-alfalfa)
• **Cold temperature exposure.** In some cases, the crown/upper taproot could not tolerate exposure to cold temperatures. Alfalfa tolerance to winter is complicated, as discussed in an earlier ICM News article, “**Alfalfa Winter Survival - A Complicated Subject**”. Several factors typically contribute to stand loss. Very wet fall soil conditions contribute to alfalfa not hardening-down as well as usual into the winter. Consequently, the alfalfa’s cold-tolerance is a bit less than normal. Additional stresses may seem minor, but they can make a significant difference when combined together. Factors like variety winter survival rating and disease resistance, soil pH and fertility, age of stand (seedlings are more susceptible to heaving while older plants are more susceptible to cold injury), soil drainage, intensity of harvest schedule and stubble height in fall can all play a role in alfalfa winter survival.

• **Alfalfa stubble height in fall.** While this factor doesn’t seem to make a difference much of the time, it is showing a strong pattern this spring. Many of the fields with winter-injury are fields **without good fall stubble**. Both cold injury to plants and heaving damage are more prevalent in fields that were cut short and late in the fall. This is the case for both young and older stands.

**Managing alfalfa fields with winter injury**

As fields continue to green-up and there are a few inches of growth, it will be much easier to assess stands and determine what course of action needs to be taken whether that’s potentially doing some patch-work seeding, keeping the field for a first crop cutting then rotating, or just rotating fields entirely.

Evaluate each field as soon as possible this spring. Table 1 and Table 2 can be used to help determine what type of action may be warranted in a field.

**Table 1. Suggested plans of action based on observations and alfalfa field conditions.**
Table 2. Recommended plant counts per square foot in either pure alfalfa or alfalfa-grass mix based on the age of the stand.

<table>
<thead>
<tr>
<th>Stand Age</th>
<th>Pure alfalfa</th>
<th>Alfalfa-grass mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeding year</td>
<td>&gt;20 plants in fall</td>
<td>&gt;12 plants in fall</td>
</tr>
<tr>
<td>1&lt;sup&gt;st&lt;/sup&gt; production year</td>
<td>&gt;12 plants in spring</td>
<td>&gt;8 plants in spring</td>
</tr>
<tr>
<td>2&lt;sup&gt;nd&lt;/sup&gt; production year</td>
<td>&gt;8 plants in spring</td>
<td>&gt;6 plants in spring</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt; production year</td>
<td>&gt;5 plants in spring</td>
<td>&gt;4 plants in spring</td>
</tr>
<tr>
<td>4&lt;sup&gt;th&lt;/sup&gt; production year+</td>
<td>&gt;4 plants in spring</td>
<td>&gt;3 plants in spring</td>
</tr>
</tbody>
</table>

Overwintering perennial forage grasses often survive better than winter hardy legumes. However, orchardgrass and ryegrasses are more susceptible than other perennial forage grasses to winter injury. Visual evaluation of grass regrowth and vitality of crown tissue is suggested when evaluating winter survival of pastures.

Reseeding in hayfields or pastures might be needed. It is not recommended to reseed alfalfa into stands that are two years or older due to the likelihood of autotoxicity. Overseeding or drilling grasses or red clover into thin or winter damaged stands should be done before May 1. Seeding after mid-May increases the likelihood seeds will germinate but less frequent rainfall will allow the soil to dry out before roots are deep enough to reach moist soil, killing the seedlings.
Additional resources related to alfalfa winter injury and managing winter injury:

- Evaluating Hay and Pasture Stands for Winter Injury
- Alfalfa stand assessment: Is this stand good enough to keep?
- Selecting forage species
- Establishing new forage stands
- Interseeding and no-till renovation

Category: Crop Production

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Crop:

Biomass and Forage

Tags: alfalfa winter injury

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