



ALFALFA WINTERKILL IN CENTRAL AND EAST-CENTRAL MINNESOTA: NOW WHAT?

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We're seeing and hearing of many cases of injury and kill of alfalfa stands in central and east-central Minnesota. Some of the damage in low spots is likely due to ice sheeting, but it seems most of the injury/kill is primarily from cold exposure. This latitude was the northern line of limited early-winter snow cover. This is a particularly discouraging situation for these producers, as this is the latest in a number of significant climate challenges to alfalfa production they have faced over the last several years.

If you haven't done so already, get out and look closely at alfalfa fields. Even if plants are not dead, they may be injured and in need of attention. Look for slow or no green up and uneven, asymmetrical growth. Dig up some plants and inspect the crown and root. Split the crown and root open lengthwise.

Healthy roots are firm and white inside with little evidence of root rot. Winter-injured roots are gray and water-soaked or brown due to root rots. If the crown/root is soft and water-soaked, it is most likely dead. If over half of the root is damaged, the plant will likely die this year. If less than half of the root is injured, the plant will likely survive for another year.

A minimum of 3 to 4 alfalfa plants per square foot must be present for a stand to still have good production potential. However, stem density is a better determinant of yield potential since plants that are injured can still survive, but will have significantly reduced stem number and thus lower yield potential. Use the following guidelines (Cosgrove and Undersander, 2003) to aid in making a decision about keeping a winter-injured stand:

Alfalfa stem density per square foot	Action
> 55	Stem density not limiting yield
40 – 55	Stem density limiting yield potential
< 40	Stem density severely limiting yield potential, consider replacing the stand

Stands can be slow to recover when injured. So don't be in too much of a hurry to tear it up until you've looked at some roots to determine health. If surviving plants are

injured but have adequate stem density to maintain the stand, its probably best to plan to push the stand with annual forages (eg. Italian ryegrass or oats) to get the most out of it this year, then plan to terminate after this growing season. If most surviving plants look reasonably healthy (eg. losses were localized and/or ice-sheeting related) you might consider inter-seeding perennials to stretch the stand beyond this year.

Some options:

- If the winter-injured alfalfa field was seeded less than one year ago (spring or late summer 2004), alfalfa can be re-seeded safely without autotoxicity concerns. Thin stands or bad spots can be inter-seeded with alfalfa. Italian or annual ryegrass, oats, and/or red clover can be added to thin alfalfa stands to increase short-term yields. Orchardgrass is a good perennial grass option for inter-seeding if you intend to try to keep the stand beyond this growing season. If dead areas are essentially bare, a conventional drill can probably do the job while the ground is still somewhat soft. If the damage is widespread, the stand should probably be torn up and is safe to re-seed to alfalfa this spring.
- If the field was seeded more than one year ago (2003 or earlier), plant a different crop for a season before planting alfalfa again to avoid autotoxicity problems. If damage is spotty, inter-seed Italian ryegrass, a small grain, and/or red clover. Attempting to inter-seed alfalfa into older alfalfa stands is risky, and unlikely to be successful because of autotoxicity. If most of the stand is dead, corn for grain or silage may be best bet, but small grains and forage grasses can make good use of the N left behind by the alfalfa.
- Thin and/or dead spots may be a good place to try Italian ryegrass. Seeded soon at 15-25 lb/ac, it would be on schedule to contribute significantly to the 2nd and later alfalfa cuttings with quality similar to alfalfa. Italian ryegrass can be challenging to cure to hay moisture, so plan to chop, make baleage, or graze. If seeding after complete alfalfa winterkill and/or stand termination, use 25-30 lb/ac of Italian ryegrass.
- Plant new alfalfa stands in different fields. Make sure herbicides used last year are not a problem for seeding alfalfa and that soil pH is OK. Planting a small grain (<1.5 bu/ac) or Italian ryegrass (<5 lb/ac) nurse crop will provide some quicker tonnage in these fields. The nurse crop stubble may also help with snow catch and/or alfalfa crown insulation from cold temperatures.
- Plant only alfalfa varieties with proven winter hardiness ($WSI < 2.5$), unless you're planning for short-term stands (3 years or less). Consult the MN variety trial results (www.maes.umn.edu). Consider seeding a low-alkaloid reed canarygrass variety with new alfalfa seedings. As our winter snow cover continues to become less consistent, a sod-forming grass in mixture with alfalfa may provide some insulation and reduced heaving potential.
- Plant a short-season forage crop to get some near-term forage with a goal of re-seeding alfalfa in early August. This might include oats or another small grain

harvested for forage at the boot stage, mixed with peas and harvested at heading, or Italian ryegrass for silage or grazing. If the pH needs to be improved for an early August planting target, work lime into the soil now. On heavier soils, its safest to wait a full year before attempting to re-seed alfalfa; but on lighter soils, if moisture is adequate, August re-seeding should be safe.

- For dry cows and young stock, sudangrass, sorghum-sudan, or pearl millet are good, multi-cut/graze options if planting gets delayed into early June. These crops can be seeded following a final spring harvest and termination of a winter-injured alfalfa stand. Foxtail millets can provide some moderate-quality forage in one cutting within 60 days after seeding, and can germinate in cooler soils than the sorghums or pearl millet. But if maximum total-season DM and energy yield are needed, corn silage is probably the best bet, even if planting as late as July 1.
- Make maximum use of pasture. Good fertilization and rotational grazing management will increase pasture productivity. Look into cost-sharing opportunities to help increase your use and management of this low-cost feed source on your farm.
- Add 40-50 lb N/ac/cutting or manure to boost yields of grass and legume-grass hay fields where the legumes are thin.
- Do some shopping and see whether you can buy hay and/or other feeds to build a ration at a cost that still provides an acceptable return.
- Discuss ideas/experiences with others. Experiment with new ideas on a small scale where possible.

Some good web references:

www.maes.umn.edu

<http://cecommerce.uwex.edu/pdfs/A3620.PDF>

http://forages.coafes.umn.edu/Italian_Ryegrass.html

http://forages.coafes.umn.edu/Reed_Canarygrass.html

www.uwex.edu/ces/crops/uwforage/AlfalfaTox-FOF.htm

www.uwex.edu/ces/crops/uwforage/ForageOptionsFOF.htm

www.uwex.edu/ces/crops/uwforage/StandEvaluationFOF.htm

www.uwex.edu/ces/crops/uwforage/PeaSmallGrainFOF.htm

www.uwex.edu/ces/crops/uwforage/ThickeningAlfalfaFOF.htm

www.uwex.edu/ces/crops/uwforage/CerealSpringForagesFOF.htm

www.uwex.edu/ces/crops/uwforage/CornAfterAlfFOF.htm