

### ARE YOUR ALFALFA ROOTS READY FOR WINTER?

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As alfalfa producers, we pay a lot of attention to how our crops look and perform above ground, but we often forget the importance of what's going on below the surface, in the alfalfa roots. Every time we harvest, the regrowth of the next cut is dependent on two factors: 1) is the root healthy, and 2) are the carbohydrate (food) reserves adequate to fuel the next cut's initial regrowth?

Often in the quest for maximum forage quality and profitability, producers become aggressive in their cutting schedules and harvest alfalfa in the prebud and bud stages. In some cases, this occurs multiple times during the growing season. This practice can be effective in producing high forage quality, but can eventually deplete root food reserves needed for future growth. If not managed correctly, aggressive cutting can result in slow regrowth, root and crown diseases, and can predispose alfalfa plants to winterkill and/or result in a shorter stand life.

**Understanding alfalfa growth and recovery after cutting:** Every time alfalfa is harvested, the first 8-10" of regrowth following a cut is fueled by the carbohydrate food reserves in the roots. When the plant has grown adequate new leaves, photosynthesis begins to replenish the food reserves. These root reserves become fully recharged as the plant approaches maturity or full flowering. The extent of replenishment of the root food reserves is closely related to the growth interval period between cuts. Aggressive harvest schedules for quality that are cut at prebud and bud are generally too short a time period to fully replenish root reserves. Proper management of cutting intervals during the year or extending cutting intervals during September-October can improve the root reserves needed to fuel production requirements.

If a farmer is to have a profitable alfalfa crop he must keep the roots healthy and maintain adequate root carbohydrates (food reserves) to fuel subsequent cuts. The following information will provide some insight regarding alfalfa root reserves, plant growth, cutting schedules, and management practices for the Upper Midwest.



*The first 8-10" of alfalfa regrowth after harvest are dependent upon root reserves which need to be replenished during the growing season.*



**Variety selection:** The first step in ensuring a healthy productive stand with adequate root reserves is selecting a variety adapted to your growing region. The variety should have a Fall Dormancy of 2-5 with a winter survival rating of 2 or less, and appropriate disease and pest resistance.

The National Alfalfa & Forage Alliance (NAFA) publishes an annual list of alfalfa varieties and their traits in a bulletin called [Winter Survival, Fall Dormancy & Pest Resistance Ratings for Alfalfa Varieties](#).

**Balancing harvest schedules for optimal forage quality and yield:** Producers are continually trying to balance forage quality and yield, usually at the expense of one the other. For years, to obtain a reasonable level of both, the recommended practice was to make a compromise on the cutting date and harvest the alfalfa at 10% bloom. This cutting regime provided adequate root reserves for seasonal production. However, new low lignin varieties are providing some flexibility to this long-standing practice by providing a wider window in which harvests can be extended a few days to increase yield while still maintaining forage quality.

**How long do you want to keep a stand?** Producers who concentrate predominantly on forage quality often consider alfalfa crop rotations of 2-3 years. The aggressive cutting for quality can reduce root reserves to critical levels, resulting in shorter stand life.

Producers interested in longer crop rotations (4-6 yrs) can enhance the life of their alfalfa stands by making sure root reserves are maintained adequately throughout the growing season. Allowing one or more cuts in a season to reach maturity increases root reserves by allowing an adequate rest period between cuts.

**Maintaining plant health and root reserves throughout the growing season:**

An early season harvest can usually be made with high forage quality without depleting root reserves. However, if aggressive cutting (bud or pre-bud) is used on subsequent midsummer cuts to obtain better forage quality, a longer regrowth interval should be implemented later in the season to replenish root reserves and minimize crown and root diseases due to plant stress. One note of caution, when an alfalfa stand reaches full flowering, the plants eventually start to send up new shoots from the crown, which is the early growth of the next cut. These new shoots are fueled by the root reserves and cutting them off would result in the expenditure of additional root reserves to replace them. The cutting height of the harvester should be raised above these new shoots when harvesting the older mature top growth.



*Healthy, productive roots and crowns are possible with aggressive management when combined with balanced fertility and time during September and October to replenish root reserves.*

**Preparing your alfalfa stand for winter:** You don't want your alfalfa to go into the winter in a weak condition. Below are a few points to consider in maintaining adequate root reserves in new and old alfalfa stands.

- With new, direct-seeded stands, extend the cutting interval to near full flowering on the first cut.
- If several harvest intervals have been aggressive (pre-bud or bud) during the season, it is best to allow a later cut to reach ~50% flowering before winter.
- Time the last cut of the season: 1) Cut 6-8 weeks before the killing frost date (24°F) to allow adequate regrowth time to recharge the root reserves. 2) Cut late enough so no regrowth occurs that would get frosted back and waste root reserves. 3) Avoid cutting older stands aggressively in the fall.
- To promote plant health, apply split applications of nitrogen-phosphorus-potassium (N-P-K) and micro nutrients per soil test. Pay particular attention to K since it is important for winter survival.

Plant health and root reserves are important factors to consider as your alfalfa stands approach winter. What you do during the growing season can greatly affect the ability of your stands to avoid winter injury. Properly managing alfalfa root reserves throughout the season can pay big dividends to producers in the form of improved quality, yield, and stand life.