

FALL CONSIDERATION OF ALFALFA

Fall is an important time for managing alfalfa, both for the health of the plants and the health of the grazing animals.

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Fall is a critical time for many forages, including alfalfa. Managers have to be mindful of how to manage the plants to ensure winter survival, while also maintaining a high-quality forage source for animals. Care must be taken to not overgraze and deplete the plants of energy for regrowth or harm the grazing animal.

What is happening below the soil?

After the final alfalfa harvest of the season, plant regrowth is critical to ensure adequate photosynthesis before winter. Photosynthesis and soil moisture provide the plants the chance to produce carbohydrates (i.e., energy) that can be used for fall regrowth, as well as be stored in the plant for future growth.

When a plant initiates regrowth after harvest, whether it be from mechanical harvesting or grazing, it will start to draw on its stored carbohydrate reserves for energy. The reserves

will be used until the plant reaches approximately eight inches in height (Figure 1). Therefore, plants less than eight inches in height are relying on reserves, but when a plant reaches eight inches, carbohydrate production then exceeds carbohydrate utilization, and storage of carbohydrates will resume and plant regrowth will continue.

The goal entering winter is to have a full “gas tank,” or maximum stored energy reserves, to increase the potential for regrowth in the spring and decrease the likelihood of winter injury. In the spring, regrowth will initiate from crown buds, which draw their energy from stored carbohydrates in the roots and crown. Having adequate amounts of energy reserves available to the plant is the best way to optimize spring growth.

Fall Management of Alfalfa

It is recommended to allow a minimum of 30 days between the last harvest and the first killing frost in the fall to allow alfalfa plants time for sufficient carbohydrate accumulation. It is important to know the average date of the first killing frost in your area when determining the last harvest date. It is equally important that a stand is healthy, with adequate soil nutrient reserves, entering winter. The healthier the stand, the lower the chance of winter injury and/or winterkill occurring.

Stand age, productivity, and health also have implications on the likelihood of winter injury occurring. After harvesting is usually a good time to evaluate stand health. Once the plants have reached approximately two to three inches in height, it is practical to do a stem count. In order to do this, you can use a PVC or metal square that measures approximately 1 foot x 1 foot. Throw the square randomly throughout your field in 20-30 spots and count the number of stems within each square.

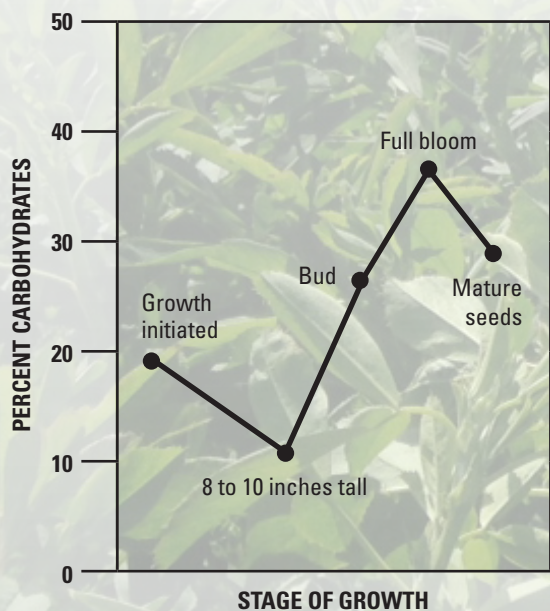


FIGURE 1. Graph depicting changes in root carbohydrate reserves as alfalfa matures.

A healthy, productive stand will have at least 55 stems per square foot. A “marginal” stand will have somewhere between 40 and 55 stems per square foot, and an unhealthy stand, one that might need renovating, will have less than 40 stems per square foot (Figure 2). Plant counts are also helpful, although a little more difficult to quantify. In a healthy stand, the goal is to have at least three plants per square foot. Sometimes it can be hard to tell whether a given plant is coming from one crown or two, as plants can become intertwined, making them indistinguishable from one another.

What about after a killing frost?

Once the plant has experienced a killing frost and has gone completely dormant, it will no longer need carbohydrate reserves for regrowth, and, therefore, it is safer for the plant to be harvested or grazed. However, care must still be taken when grazing alfalfa immediately after a killing frost due to bloat concerns, which are discussed below. Care should also be taken to ensure adequate stubble height be left to help with snow capture and to help prevent ice sheeting. Snow will help insulate the soil to prevent temperature fluctuations. This helps ensure plants don’t get exposed to high temperatures, which can cause a break in dormancy and use of carbohydrate reserves too early, leading to increased winter injury or winterkill. Six inches or more of snow will protect plants from severe cold and reduce potential winterkill.

Bloat Considerations

Bloat is a big concern for livestock owners choosing to graze alfalfa in the fall. Actively growing alfalfa plants pose a risk for bloat due to the high content of soluble proteins in the plant. In non-bloating legumes such as sainfoin, plants also contain condensed tannins which bind to soluble proteins and prevent occurrence of bloat.

When an animal rapidly ingests plants with high levels of soluble proteins and little to no condensed tannins, rumen microbes rapidly begin digestion and produce fermentation gases, and they produce foam. The foam builds on top of the rumen liquid and prevents the fermentation gases from escaping the rumen, creating a distended appearance of the animal’s abdomen during bloat.

To decrease the likelihood of bloat, avoid grazing actively growing alfalfa stands and grazing alfalfa stands immediately after a frost. Keep in mind that grazing even after light frosts that don’t cause the plant to go dormant can still pose a risk to the animal. The crystallization of cell solubles from the freezing temperatures cause the soluble proteins to be more readily available to digestion. Therefore, the general recommendation is to wait at least three to five days after a killing frost, and especially after a light frost, before considering grazing.

Overall Recommendations

Fall is an important time for managing alfalfa, both for the health of the plants and the health of the grazing animals. Ensuring adequate regrowth before the first killing frost will help prepare the plant for winter and decrease the risk of winter injury or winter kill. Allowing sufficient time after a frost and allowing the plant to go dormant before grazing will also decrease the risk of bloat. Regardless of whether you are harvesting the plant with grazing animals or mechanically, always leave enough stubble post-harvest to increase snow capture and decrease fluctuations in soil temperature throughout the winter season.

A useful tool available for alfalfa producers is the “risk of alfalfa winter injury” assessment, which can be found in the Alfalfa Management Guide (<https://www.agronomy.org/files/publications/alfalfa-management-guide.pdf>). This tool helps predict how “at risk” a stand is for winterkill and winter injury based on specific criteria. This publication and other alfalfa resources can be found on the MSU Forage Extension website at <http://animalrangeextension.montana.edu/forage/>. ■

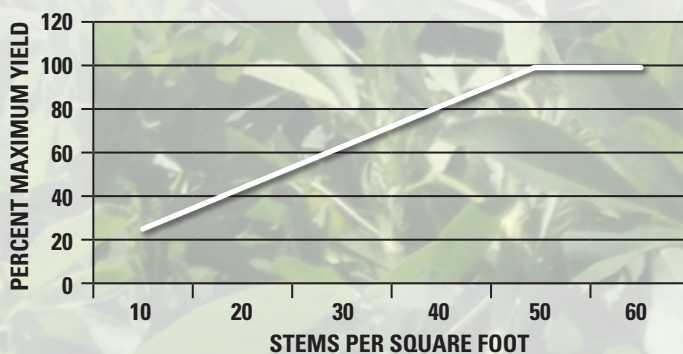


FIGURE 2. Graph showing estimated yield productivity of an alfalfa stand based on stem counts