Summer and Fall Alfalfa Management Practices

To increase the possibility of winter survivability a late summer alfalfa cutting should occur early enough so plants can regrow, produce, and store carbohydrates in the roots and crowns before entering fall dormancy. Alfalfa responds very well to potassium and phosphorus fertilization. Accurate stand evaluation is critical for estimating yield potential and deciding whether to keep an alfalfa stand.

Late Summer and Fall Alfalfa Harvests

In the fall, alfalfa stands need a break from harvest during the six-to-eight weeks prior to the first killing frost. This rest period allows plants to build up adequate reserves of carbohydrates in the roots before winter begins. In northern areas, this timeframe is roughly the first of September through mid-October and later in more southern regions.[1] This practice can help plants survive winter temperatures and use the stored carbohydrates to regrow in the spring. The speed of spring regrowth the next season may be reduced, stands may thin, and yield potential may be lower if plants are cut during this rest period. Research has shown that a late fall cutting can be done as long as there will be an accumulation of less than 200 growing degree days (using the base temperature of 41 °F) after the cutting to prevent regrowth and depletion of stored carbohydrates; allowing plants to survive winter conditions.[2]

Farmers may be tempted to harvest alfalfa during the rest period if significant growth has occurred, but doing this would initiate regrowth and reduce root reserves during a critical time. The risk of stand damage is somewhat reduced under the following conditions in areas with less severe winters,[1] if the stand is in bloom at the time of the fall cutting, if it has been at least 45 days since the last harvest, and if the stand is old and at the end of its longevity.[3]

Conditions where a harvest during the fall rest period are not advised include: stands less than a year old, stressed fields, fields with inadequate fertility, and where the alfalfa product does not carry multi-pest resistance.[3] Waiting and making a final cutting after the first hard freeze (24 °F or lower) will reduce the risk and may help reduce pest problems.[3] For example, Minnesota researchers found that the highest yields came from three cuttings during the growing season followed by a late-fall cutting.[1]

Fertilizer Needs

Each ton of alfalfa dry matter removes about:

- 14 pounds of phosphate
- 58 pounds of potash
- 30 pounds of calcium
- 6 pounds of magnesium
- 6 pounds of sulfur.[1]

A current soil test should be used to determine existing soil nutrient levels, especially pH, phosphorus (P), and potassium (K), to avoid over or under fertilizing in the future. Soil tests are the most reliable method to prevent future nutrient deficiencies, which can decrease alfalfa yield potential and quality. However, for sulfur a tissue test is the most accurate method to assess the need.

The recommended soil pH level is between 6.8 and 7.0. Split applications of phosphorous and potassium, based on yield goals, are recommended after the first cutting and again in late summer. If all fertilizer is applied as one annual application, the task should be completed in early fall which may help minimize the potential for winter injury.

Stand Evaluation

Alfalfa has the ability to yield well over a range of stand densities. An accurate method to assess established alfalfa stands and estimate yield Potential is to count stems in the late summer or early fall (Figure 1). Counting stems can help decide whether it will be better to keep or rotate out of a stand. Older stands tend to have fewer plants, but more stems per plant in established stands. To estimate the yield potential of the stand count the stems within an area (either 17x17 inches or a two square feet frame) at 4-5 random locations. Average the counts and divide this number by two to determine the average stems per square foot. If the count is more than 55, stem density has 100% yield potential; whereas 40 stems have about a 72% yield potential and replacement should be considered.

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Autotoxicity

Limited seedling establishment can occur when seeding into existing stands or into a field where alfalfa was recently removed. Autotoxicity is a problem in alfalfa stands that are two or more years old. However, reseeding into an existing stand is generally successful if the stand is less than one year old and soil pH and fertility in those areas are optimum.

Autotoxic compounds produced by alfalfa can: inhibit plant growth, increase the number of days to germination, reduce root and shoot length, and negatively affect future yield potential. In cases where alfalfa stands are thin but it is not practical to destroy the stand, consider interseeding grasses or clover to meet forage needs.

Weed Management

Conventional alfalfa products have limited weed control options, which can hinder stand establishment and persistence resulting in lower yield potential (Figure 2). Roundup Ready® Alfalfa system gives alfalfa producers the advantage of broad-spectrum weed control and application flexibility with Roundup® brand glyphosate-only agricultural herbicides, which may reduce crop injury and rotational concerns. Based on the weeds present, one or more herbicides with different effective sites of action should be used at least once during the middle years of the stand to help reduce the potential for selecting herbicide resistant weed populations. However, if using a Roundup ready product, Roundup will not be an option for weed control.

Management Summary

- Providing an adequate supply of nutrients, especially potassium, is important to maintain high yield potential.
- Winter survivability can be improved if the last cutting is completed by late summer, which allows time for adequate root reserves to be replenished, or late in the fall after a hard freeze when there would be no regrowth.
- Carbohydrates stored in the roots and crowns provide energy for regrowth after harvest and provide winter hardiness to survive winter temperatures.
- Seeding alfalfa following alfalfa rotations are usually unsuccessful due to autotoxicity. Reseeding thin stands is only somewhat successful during the initial year of establishment and with adequate soil pH, fertility, and minimal disease or pest pressure.
- Grow an alternative crop for a minimum of one year to negate autotoxicity and to give time for the soil to improve pH and fertility.
- Planting a Genuity Roundup Ready Alfalfa product can help increase establishment, forage quality, and yield potential by offering more weed control options compared to planting conventional alfalfa products.

Also, consider planting HarvXtra® Alfalfa with Roundup Ready® Technology. It is a biotechnology-derived trait that provides reduced amounts of indigestible lignin at harvest when compared to conventional products of the same harvest age. The new trait provides a wider cutting window providing harvest flexibility and essentially eases the yield versus quality trade-off faced by alfalfa producers. In addition, fewer cuttings may be made throughout the year while maintaining quality and overall potential yield. This allows the final cutting to be made earlier which improves carbohydrate storage in the roots, thus increasing potential for winter survivability.

Figure 1. Alfalfa stems count method

Figure 2. Regrowth of Roundup Ready® Alfalfa after a postemergence application of a Roundup® brand glyphosate-only agricultural herbicide (left) compared to conventional alfalfa after a postemergence application of a conventional herbicide (right).

Additional information on best management practices for alfalfa can be found in the Alfalfa Management Guide.[1] This guide was developed by Extension specialists from several universities to give an overview on production practices and can be found online at: https://www.agronomy.org/files/publications/alfalfa-managementguide. pdf.

Sources:

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[2] Bamhart, S. 1999. Fall harvest management of alfalfa. Integrated crop management. Iowa State University. http://www.ipm.iastate.edu/ipm/icm/1999/9-13-1999/alfalfaman.html.

[3] Lacefield, G.D., Henning, J.C., Rasnake, M., and Collins, M. 1997. Alfalfa -The queen of forage crops. AGR-76. University of Kentucky Cooperative Extension Service. www.ca.uky.edu.

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