

Importance of In-Season Fertility Management

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When growing alfalfa, a lot of focus is placed on proper fertility and management before the seed is ever placed into the ground, however, care should be taken post-establishment to ensure continued success and persistence. Fertilizing established alfalfa is critical for maintaining optimum yields, as the plants are only able to meet their genetic potential when their nutritional needs are met. A common mistake is shifting to premium genetics with higher yield potential, without making changes to fertilizer programs; that's a big mistake when considering the economic returns on investment.

It is common knowledge alfalfa has its highest yield in the first cutting, with later cuttings usually having lower production. Research has found splitting fertilizer applications throughout the season – either applying twice a year or in some cases more – can help improve alfalfa production throughout the entire growing season.

A good example of this is phosphorous (P) application. There are several tactics employed by farmers throughout the U.S. Some will choose to apply the entire estimated P needs for the stand life at one time prior to planting. Phosphorous is a fairly immobile nutrient, and slowly available to the plant throughout its lifespan, so it can make sense to apply once. However, California researchers found applying smaller amounts of P as a top-dress post-establishment can have marked improvements on alfalfa yields. They recommend applying P in late summer or early autumn along with early season application to help evenly distribute availability throughout the season.

Applying potassium (K) fertilizers post-establishment is critical for optimal yield and persistence, particularly since K is a fairly mobile nutrient. Research has found applying K along with P after first and last harvests was the best method of improving overall seasonal production. An interesting note about alfalfa and soil K is that alfalfa is considered a luxury consumer, where it will absorb K in excess of its needs without seeing impacts on production. This is one reason why soil testing and continued monitoring is critical to fertilizing effectively and economically.

Sulfur (S) is another nutrient that has received attention in recent years. Historically, we have not had to worry about S needs due to soil availability. However, with improved regulations and cleaner industrial processes, we are seeing areas where S deficiency is becoming an issue. Applying S in appropriate amounts can have significant impacts on yield and quality. Montana research found, in S-deficient soils, yield deficiencies could not be overcome by simply adding more P and K. Sulfur was required to reach optimal production. In some plots, yield was improved by 30% when S deficiencies were corrected. One thing to note when creating an S fertilizer plan is soil tests are not a great indicator of available S in the soil – tissue testing should be employed along with soil testing to ensure requirements are appropriately addressed.

Other micronutrients are also critical to ensuring appropriate production and persistence. Boron and other micros should be monitored and deficiencies addressed as needed. Similar to S, tissue testing is usually a better method for diagnosing issues and should be used in combination with soil tests to monitor any fertility program.

Nutrient balance is also critical. Just because some nutrients are in sufficient amounts doesn't mean the plant can overcome deficiencies in other nutrients. A Purdue study found stands fertilized with P but not K yielded less than unfertilized controls. Ensure you evaluate your entire fertility program, not just one or two nutrients, to ensure maximum production of your alfalfa genetics. Use local fertility recommendations when available and always check with your agronomist, Extension/university faculty, or seed provider to determine the best program for your specific needs.