Grazing Alfalfa: Is it Right for You?

Jimmy C. Henning
Department of Agronomy
University of Kentucky

Grazing alfalfa can be a very profitable and valuable practice for many Kentucky farmers. How do you know if this practice will work for you? First, you must be able to grow alfalfa. Second, you must address the concerns that are specific to grazing alfalfa.

The following are requirements to producing the stand you wish to graze.

1. Find the proper site.

Alfalfa or alfalfa-grass mixtures grow best on deep, well-drained soils. In fact, the best use of level-to-gently sloping, deep and well-drained land would be to plant the highest yielding, highest quality crops such as alfalfa or a mixture of alfalfa-orchardgrass or alfalfa-timothy. Alfalfa-cool season grass mixtures work well where soils are at least 2 feet deep and well-drained. More rolling sites can be seeded to alfalfa using no-till planters.

2. Supply proper fertility.

Lime, phosphorus, and potassium should be applied according to soil test recommendations prior to seeding. For alfalfa, soils should be pH 6.5 to 7. Limestone can be applied to raise soil pH (makes soil less acid). Low soil pH reduces availability of P and inhibits the formation of N-fixing nodules on the roots of new legumes. Low pH can also make aluminum more soluble in the root zone, which is toxic to roots. Legumes are more sensitive to low pH than grasses. If lime is required to correct a low soil pH, application should be made several months prior to seeding so the proper pH adjustment can occur.

Nitrogen is not required for alfalfa establishment and is usually not recommended. If the only way to supply needed phosphorus is Mono- or Di-Ammonium Phosphate (MAP or DAP), don’t worry about the nitrogen carried with the P. While the N will stimulate the growth of weeds, it will also stimulate the growth of the alfalfa. In these cases, observe the field frequently and be prepared to use herbicides or timely clipping for any weed flushes that may come.

Phosphorus is essential for good yields and for fast root growth. Where soil tests indicate that additional P is needed, the yield response of legumes to added P will be as dramatic as adding N to grasses.
Potassium is frequently needed for maximum alfalfa yields, developing good winterhardiness and for overall plant disease resistance.

3. Select high quality seed of an adapted variety.

Planting high quality seed of an adapted, improved variety is an essential step toward establishment and longevity of an alfalfa stand. Such seed should have a high percent germination and purity, low percentages of weed seed, and freedom from noxious weed seed. Certified seed meets or exceeds minimum standards for purity, germination and quality and will have a blue tag attached to the bag. Some varieties are not available as certified seed because the company has taken the responsibility of assuring the genetic purity and seed quality rather than use a seed certification agency. These varieties are 'Plant Variety Protected' or PVP'ed. This designation will be on the seed tag in a prominent location.

The PVP approach provides no outside guarantee of seed quality and genetics other than the company's integrity. However, it is in the company's best interest for the product they sell to perform as expected. To address this concern, current alfalfa variety tests at the University of Kentucky are conducted with seed from sources available to farmers (in other words, from a commercially available bag of seed). Performance of varieties reported in these tests should be very similar to farmer experience with the same variety.

Alfalfa research at UK has found that choosing a top yielding variety is worth 1500 to 2000 pounds of hay per acre per year for the life of the stand compared to the check varieties (such as Arc, Saranac AR, and Buffalo).

4. Prepare a good seedbed.

A good seedbed will be level, firm and as weed-free as possible. The two major ways to prepare the soil or field for planting are to use conventional tillage to completely destroy or bury existing vegetation and to use herbicides to kill or suppress existing vegetation.

Conventional tillage. Seeding into conventional seedbeds are often more successful than no-till seedings due to better weed suppression, better control of existing vegetation, and better seed-soil contact. The soil should be tilled (by disk or plowing or a combination of both) to incorporate lime and fertilizers, destroy weeds and other vegetation, and prepare a level, firm seedbed. Ridges and depressions should be reduced to a minimum to make mechanical harvest operations easier. In general, a foot print on properly firmed seedbeds should not exceed 1/4 inch in depth. Conventional tillage may be required to control troublesome perennial weeds like curly dock and johnsongrass and correct soil compaction problems such as traffic pans.
Herbicide Suppression/No-Till. The no-till method of seeding alfalfa uses herbicides to suppress existing vegetation in preparation for planting. This method is most often employed when trying to convert grass pasture or hay fields to alfalfa. Results from no-till seedings into sod fields have been variable. Any place where competition was not controlled from the original sod, seedings have failed. Competition from existing sods must be minimized by the use of herbicides prior to seeding. Glyphosate (Roundup Ultra is one current formulation) and paraquat (Gramoxone Extra is one current formulation) are examples of choices for sod suppression.

Glyphosate is a translocated herbicide and works best when grass is actively growing. Sod suppression with glyphosate is improved by the addition of ammonium sulfate in the tank. Glyphosate is often recommended for suppression of orchardgrass because it is tolerant of paraquat. In one demonstration seeding in Bullitt County, orchardgrass was sprayed with 2 quarts of glyphosate with ammonium sulfate. While grass control was eventually excellent, it was slow. Excellent stands resulted.

Paraquat is a 'burn-down' type herbicide with virtually no translocation. When sprayed in high volumes of water (> 20 gallons per acre) to actively growing tall fescue, paraquat is very good at suppressing the sod. A single spray of paraquat can give fair suppression of tall fescue, but two sequential applications, spaced about 14 days apart will give better fescue control. Our experience has shown that the more active the fescue is growing, the better the paraquat control.

Most no-till seedings of alfalfa into sod have used spring applications of herbicide to kill the grass, with variable success. There are indications that starting herbicide applications in the fall prior to seeding would aid in getting a more vigorous and weed-free stand. The weakened sod will be damaged further by the winter and should be sprayed again in the spring. Following the fall application with a subsequent spraying the following spring should be effective in killing most of the tall fescue present in the pasture. In addition, glyphosate sprayed in the fall can give some control over problem perennial weeds such as dock, Canada thistle, and even white clover.

A demonstration comparing alfalfa establishment when fescue control was begun in the fall versus the spring was begun in Lincoln County Kentucky in the fall of 1996. Where the sod was treated with herbicide (Roundup in this case) in the fall plus paraquat in the spring, stands were noticeably denser and more weed-free.

5. Inoculate legume seed or use pre-inoculated seed.

To insure proper nodulation, inoculate all alfalfa seed with the proper bacteria just prior to seeding or use pre-inoculated seed. Check the seed tags of pre-inoculated seed for the expiration date for the inoculum.
Inoculate legume seed even if it has been grown in the field previously. To ensure that inoculum is stuck to each seed, use an appropriate commercial adhesive or sugar solution. Satisfactory results are obtained when a small amount of sugar solution is first added to seed and thoroughly mixed to get all seed moist, not wet. Then add the inoculum and mix again. If done properly, the peat in the inoculum mix will absorb excess moisture so seed will flow well through the seeder.

6. Seed at the proper rate, date, and depth.

**Seeding rate.** UK recommends 12 to 20 lb/A of alfalfa seed for new stands. Most seedings are made with 18 to 20 pounds of seed per acre. Research from Penn State indicates that seeding rates higher than about 9 to 10 lb/A do not improve stands or yield when alfalfa is drilled in rows. However, the additional seed is justified to account for the added field variation experienced in no-till seedings. Fields to be established no-till (especially pasture fields) will typically be more variable in their soil and surface characteristics making precise seed placement more difficult than in research or tilled situations.

**Seeding Date.** Alfalfa may be seeded in either spring or late summer. Actual optimum seeding dates will vary by year. For example, the last few springs have been unseasonably cool and wet. In these years, seeding after the April 15 cut-off for alfalfa has been successful and even advantageous. Fall seedings of alfalfa should only be made into prepared seedbeds (not no-tilled into killed sod) due to sclerotinia risk. Sclerotinia only infects in the fall when young plants are kept continually wet from rain and dew. Alfalfa plants from a spring seeding or plants older than 1 year develop a natural resistance to sclerotinia infection. Several legumes are hosts of sclerotinia, and the inoculum can be brought into newly seeded alfalfa fields by wind. A history of sclerotinia within the county or on the farm indicates that stands are at a greater risk for infection.

Experience indicates the optimum seeding date ‘window’ for spring planted no-till alfalfa can be extended beyond that for prepared seedbeds. Sprayed sods will retain their moisture longer and will be cooler than conventionally prepared seedbeds. In 1996 and 1997, no seedings were made before April 15, which is usually thought of as the ‘cut-off’ date for alfalfa seeding in central Kentucky. Over the past few years, cool wet springs have led to poor seedling vigor and also to susceptibility of alfalfa seedling to attack by aphanomyces root rot.

Use a seeding method capable of precisely placing the seed in contact with the soil. Seeding methods for alfalfa can vary from broadcasting plus cultipacking to no-till drills. Any method that places the seed 1/4 to 1/2 inch deep and in good contact with the soil will result in a good stand. For prepared seedbeds, it is perfectly acceptable to broadcast the seed on the soil surface and then roll the field with a cultipacker (corrugated roller). A Brillion-type seeder does this in one trip. For no-till seedings, drills must be used that are properly adjusted to deliver the rate desired at
the proper depth. Each needs to be properly adjusted and operated to place the seed about ¼ to ½ inch in the soil regardless of soil conditions.

Seeding too deep is the most common mistake made when using no-till drills to seed alfalfa. Seeding too deep is especially easy to do in the spring when soils tend to be wetter and softer. It absolutely pays to take the time to understand how the drill being used needs to be set in order to deliver the seed into the top ½ inch of soil. Take time to figure out the depth control for the drill to be used. Experience shows that you may not have time to do it right but you will have time to do it over.

Deep planting is probably one of the main causes of uneven stands of spring seeded alfalfa. Deep planting delays emergence, reduces seedling vigor, and decreases seedling numbers in alfalfa. A rule of thumb for seeding depth with alfalfa: if you do not see some seed on top of the ground when seeding no-till, then there is a very good chance that you are seeding too deeply. Open the slit behind the disc openers to determine depth of seeding.

Check calibration of seeding equipment. Make sure that the drill is set properly to deliver the desired amount of seed. Drills differ in the types of mechanisms for adjusting seeding rate. Although, drills will have general settings for seeding rates of particular crops, the actual delivered rate will vary according to seed size, seed coatings, seed-flow characteristics, and the adjustment/wear of the seed metering device. Lime coated alfalfa seed will flow through seed boxes faster than uncoated seed. The increase in seeding rate that is due to lime coating seems to differ with the manufacturer of the coating. In one case, the increase is about 30% while another line of coated seed increased flow rate by roughly 10%. Clearly the point here it to check the seeding rate of the drill.

One way to do a rough field calibration is to figure out how far the drill should travel to deliver a pound of seed, collect the output from the seed tubes for this distance and then compare this amount to a pre-weighed pound of material (A one pound bag of dry beans will work). For example, if the desired seeding rate was 20 lb/A and was to be delivered by a 10 foot wide drill, collect the seed from all seed tubes for 218 feet (43560 sq. ft /A divided by 10 ft = 4356 ft to deliver 20 lb of seed. 4356 divided by 20 = 217.8 ft to deliver one pound of seed.) While not terribly accurate or sensitive, this method will keep you from making large errors in seeding rates and does not require a scale.

7. Control Weeds and pests after seeding.

Nearly all seedings of alfalfa will be infested with weeds in the first 60 to 90 days. Late summer seedings are less prone to weed invasion than are spring seedings. Control methods include clipping, limited grazing, or herbicides. Post-emergence herbicides are available for use in pure alfalfa stands during the establishment year, but no herbicides are labeled for alfalfa-grass stands. Therefore, seeding alfalfa alone
is desirable because it gives you infinitely more herbicide options during establishment than with mixed stands. For more information on herbicide options for alfalfa, consult UK College of Agriculture publication AGR-148, ‘Weed control in alfalfa and other forage legume crops.’

In addition, potato leafhoppers can cause stand loss new spring seedings. These insects come in on storm fronts and cause yellowing and stunting of alfalfa. These symptoms are often masked by a canopy of weeds or are blamed on summer drought.

8. Allow seedlings to become established before use.

Allow alfalfa to become established before the first harvest. Spring seedings will take about 75 to 90 days to get established, but will probably not be in a uniform stage of maturity (plants will be in all stages from vegetative to full bloom). Take the first cutting for hay in stands that are to be grazed, and avoid grazing while the soil is wet and will not support hoof traffic. Significant stand loss can occur from treading damage to young stands.

Considerations Specific to Grazing Alfalfa

1. Choose a ‘Grazing Tolerant’ variety.

If you plan to graze an alfalfa stand, you should consider using a variety documented to be grazing tolerant. Understand that the grazing tolerant trait is NOT a requirement alfalfa to be grazed. The grazing tolerance trait provides a safety net or insurance against stand damage if you must overgraze that alfalfa during any given year or years. Since it is likely that no one is ever perfect, using a grazing tolerant variety is highly desirable. That variety should meet the same requirements for yield and disease resistance that you would expect in a hay variety.

Much progress has been made in developing varieties that are tolerant of grazing. UK has done several studies to document persistence and tolerance to abusive grazing in alfalfa varieties since 1995.

2. Manage the grazing stand for persistence.

This requirement would include following a good rotational grazing schedule where the available forage in a pasture is grazed down in 5 to 7 days or less and then the stand is rested for 24 to 28 days. The alfalfa field must be subdivided into 5 to 8 divisions for maximum flexibility.

While insect pests such as the potato leafhopper and the alfalfa weevil may not require chemical control in grazed alfalfa, they can still cause economic damage to the
stands in some situations. Mainly be aware that grazing alfalfa does not eliminate the need to look for problems with these pests.

Apply needed fertility. When alfalfa is grazed, most of the nutrients return to the pasture in the form of dung and urine. However, the nutrients may not be evenly distributed. Soil test to know what base levels of fertility are present, and soil test every three years or so to make sure the pH, P, and K levels are okay and to see what fertility adjustments may be necessary. Fertilizer recommendations on grazed alfalfa are difficult and far from exact, since manure and urine distribution is not perfectly uniform across the field.

Plan to rest the stands in the fall and winter. Even alfalfa in pasture needs the fall recovery time (mid-September to around November 1) to recharge its root reserves for winter. Do not plan to winter cattle on alfalfa fields after November 1. Alfalfa fields provide very little hoof support and can be severely damaged by cattle in wet weather with above freezing temperatures.

3. Manage bloat.

Bloat is always a potential problem when grazing alfalfa. Remedies include feeding a bloat preventative, and not turning hungry cattle out onto lush, wet alfalfa.

4. Use a grass with the alfalfa.

Adding a grass in with the alfalfa will give extra hoof support in wet weather, will help prevent bloat, and will help to fill in between alfalfa crowns. Weed control in a grass-alfalfa mixture is more complex, as there are very few herbicides that can be used that will not kill the grass.

5. Make the most economic gains from the alfalfa.

Finally, plan to use alfalfa in pasture in such a way to maximize the economic return. Grazing dairy cows, stockers, or calves (creep grazing) are good ways to convert the excellent alfalfa forage into sellable product.

Summary

Grazing alfalfa can be a very profitable and valuable practice for many Kentucky farmers. Grazing alfalfa is right for you if: 1) You can grow alfalfa and 2) You are willing to rotationally grazing and manage for persistence of the stand. You will be most profitable if you also plan to reduce the chances for bloat, and if you use the alfalfa on the most productive animals (highest nutritional need) on the farm.