



Establishing and Managing Horse Pastures

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Introduction

Kentucky is known for its grass pastures and horses. Climatic and soil resources support Kentucky's competitive advantage in these areas. Pastures supply nutrients, provide hoof support for exercise, control erosion, and add to the beauty of horse farms. The ability to establish and manage horse pastures is therefore important to horse farm managers.

Since horses graze closer than cattle and tend to repeatedly graze the same areas of a pasture, the stand of desirable forage plants in a pasture can be reduced or eliminated. Hooves can also damage pastures, even with grasses that form tight sods. Areas around gates, fencelines, waterers, and hay feeders get the most traffic and are the hardest to maintain.

Good establishment and management principles must be employed to maximize the value of grass, and in a broader sense, the value of pastures to Kentucky's horses. Establishment principles include proper fertilization, species and variety selection, seeding date and rate, seeding method, and competition control. Management principles include improved grazing plans or rotations, periodic soil testing, annual fertilization, and weed management.



Basic Establishment Requirements

Whether you are seeding all or part of a pasture, following these recommendations will increase your chances of success.

1. Apply any needed lime and fertilizer amendments. A current soil test will indicate needs for lime, phosphorus, potassium, and other nutrients (except for nitrogen) needed for the species to be seeded. Information on how to properly take a soil sample is available from your county Extension office (see AGR-1, *Lime and Fertilizer Recommendations*).

2. Use high-quality seed of an improved variety. Use a variety that has been proven to be a top performer under Kentucky conditions. University research trials from Kentucky or surrounding states are excellent sources of this agronomic information (see current UK Progress Reports for forage crops).

High-quality seed has high rates of germination and is free of contamination from seed of other crops or weeds. Look for this information on the seed tag.

When buying tall fescue that will be used as pasture for pregnant mares, make sure that the tag clearly states that this variety is endophyte-free or low endophyte (usually less than 5 percent). If this information is not clearly stated, assume that

the tall fescue is infected, and **do not use** in pastures to be grazed by pregnant mares. In addition, some varieties of perennial ryegrass contain an endophyte that can be harmful to horses. The turf-type perennial ryegrasses are more likely to contain the endophyte than forage types.

3. Plant enough seed at the right time. Seeding rates will be affected most by the forage crop to be sown (Table 1). When sowing a mixture, less seed of each component is used than when it is sown alone. The seeding rates in Table 1 are to be considered as minimums. For a full listing of forage crops and seeding rates and dates, see AGR-18, *Grain and Forage Crop Guide for Kentucky*. Since seed cost is small relative to the other inputs, there are often benefits of using higher seeding rates. In particular, higher grass seeding rates give quicker ground coverage.

Grasses and legumes can be seeded in either spring or fall. However, cool-season grasses (bluegrass, orchardgrass, tall fescue) are most easily established in the late summer and early fall. Seedings of alfalfa and red clover are best in early spring but may be done in late summer as well.

4. Use the best seeding method available. In general, planting into a conventionally tilled seedbed is more effective than no-till seedings. Both are more reliable than broadcast (frost) seedings. These are called frost seedings because they rely on the freezing/thawing cycle of winter to work the seed into the soil. All three methods can be successful if the seed is placed in firm contact with moist soil at a depth from which the seedling

Table 1. Common seeding rates and optimum seeding dates for pasture plant species.

Species	Rate lb/A (seeded alone)	Rate lb/A (in mixtures)	Optimum Seeding Date
Tall fescue	15 - 20	10	8/15 - 9/15
Orchardgrass	10 - 12	5	8/15 - 9/15
Timothy	6 - 8	4	8/15 - 9/15
Bluegrass	30	20	8/15 - 9/15
Alfalfa	15 - 20	15	4/1 - 5/1, 8/15 - 9/15*
Red Clover	12	6 - 10	Winter**, 3/15 - 4/15
White Clover	--	1 - 2	Winter**, 3/15 - 4/15, 8/15 - 9/15

* Seedlings of fall-seeded alfalfa can be killed by sclerotinia crown and stem rot.

** Winter seeding of clovers, often called frost seeding, can be made on short sod in late January or February.

can emerge. Seed of all the forage crops in Table 1 should be sown ¼ to ½ inch deep. Broadcast or frost seedings are recommended only for red clover and white clover during late January or February sown onto very closely grazed or clipped sod. Hoof traffic by grazing animals can also serve to “tread in” these small legume seeds. Seeding grasses in this manner is not recommended.

5. Control competition. Many seedings fail because of competition from weeds. Tillage to prepare the seedbed will control many weeds. Herbicides can be used to control weeds when seeding no-till. Always read and follow label directions.

Control weeds after seeding by mowing or grazing. Use herbicides on newly established stands as a last resort, since herbicides can potentially injure forage seedlings. Simply suppressing weeds by mowing or light grazing for a few months may be enough control for successful establishment.

6. Allow the immature seedlings to become established before putting the pasture back into full use, if at all possible. Overgrazing newly seeded areas is a major cause of seeding failures. A few brief grazing sessions can be tolerated. For new seedings of grass, it is best to allow it to grow to maturity and then to harvest one cutting of hay before fully returning the field to pasture use. When it is not possible to keep animals off the pasture while the grass is getting established, consider splitting the field and seeding half the field at a time.

Specific Seeding Situations

Re-establishing grass alone. The best method is to plow or disk the field in late July or early August. Make a fine, firm seedbed, and seed in late August or early September. Seed may be planted by a grain drill, no-till drill, billion seeder, or just by broadcasting plus cultipacking. If seedbed firmness is in question, roll with a cultipacker before and after seeding.

An alternate method is to use a “burndown” herbicide (such as Gramoxone Extra or Roundup Ultra) to suppress the vegetation present and drill the grass with a no-till drill in late August or early September (see AGR-172, *Weed Management in Grass Pastures, Hayfields, and Fencerows*). Translocated products such as Roundup will be more effective on perennial weeds.

Delay seeding for two weeks after spraying translocated herbicides to allow the sprayed vegetation to die down.

If the goal is to kill endophyte-infected tall fescue and replace it with another grass, multiple applications of herbicide plus the use of interim “smother” crops may be necessary. For example, you might suppress the tall fescue with herbicide in the spring, drill a summer annual grass (such as foxtail millet or pearl millet) into the sod, and then drill the desired grass into the millet stubble in the fall. The summer annual grass provides pasture or hay while “smothering” the tall fescue that tries to regrow after the herbicide application. (*Caution:* Horses should not be allowed to graze sorghum. A compound in the green foliage of sorghum species occasionally causes spinal cord degeneration and paralysis in horses. There is no treatment, and affected horses seldom recover.) This interim crop also allows time to see if any fescue regrows. A second herbicide application will probably be necessary just prior to seeding in the fall to suppress any escaping tall fescue and any other weeds that are present. **Do not let the tall fescue go to seed in the year of re-establishment.**

Avoid spring seedings of cool-season grasses. While these can be successful given adequate moisture and mild temperatures during the growing season, the failure rate is greater than for fall seedings. To increase the chance for success with spring seedings of cool-season grass, plant early (mid- to late March).

Good Grass Choices for Horse Pastures

Pasture grasses differ in their tolerance to close grazing and traffic. Bluegrass and bermudagrass form tight sods and are the most tolerant of close grazing and traffic. Orchardgrass is the least tolerant, and tall fescue is intermediate between orchardgrass and bluegrass or bermudagrass.

- Orchardgrass, endophyte-free tall fescue, or bluegrass* alone.
- Equal amounts of bluegrass* with either orchardgrass or endophyte-free tall fescue.
- Equal amounts of orchardgrass and endophyte-free tall fescue.

* Bluegrass is best adapted for central, eastern, and northern Kentucky and may not contribute much to horse pastures in southern and western Kentucky.

- Perennial ryegrass is a short-lived cool-season grass that has exceptionally high seedling vigor and can be used for a 2- to 3-year solution or to thicken up troublesome areas around the farm. Insist on endophyte-free perennial ryegrasses. The turf-type perennial ryegrasses are most often infected with the endophyte, while forage types are not. Ask to be sure.
- Timothy, a superior hay plant, is not a good pasture plant when seeded alone.
- Ladino, red clover, alfalfa, or annual lespedeza may be added to any of the above choices if a grass-legume pasture is desired.

Establishing grass-legume mixtures. Legumes are more competitive than grasses in the seedling stages because they emerge faster, have a taproot-type root system that penetrates deeper and faster, and develop leaf area more quickly. When seeding a grass-legume mixture, choose the seeding date, rate, and method that give the maximum advantage to the species that you need the most. Spring seedings favor legumes, and fall seedings favor grasses. If a good grass base is desired as fast as possible, plant in the fall and consider reducing the amount of legume seed in the mix or seeding the grass alone. More legume can be added by a frost seeding the following January-February or by no-till drill in March to early April.

Renovating with legumes. Adding legumes to existing grass pastures increases forage quality, adds nitrogen to the system, and is desirable in horse pastures. Begin by suppressing existing sod by grazing or very close mowing. White or red clover may be either broadcast in late winter (January-February) or drilled in early spring (March-April). White clover is preferred over red clover for horse pastures because of the incidence of excessive salivation in horses grazing red clover in mid- to late summer (due to the toxin slaframine, a by-product of a fungal infection of red clover). For broadcast seedings, make sure that the sod is short enough for some seed to fall on bare ground. It may be necessary to drag or lightly disk the pasture to open up the sod and expose some bare ground.

Renovating high-traffic areas. Improving or re-establishing grass cover in high-traffic areas around fences, gates, and barns is probably the most common pasture problem facing horse managers. On the assumption that it is not possible to keep horses off such areas until vegetative cover is attained, the question becomes how best to get vegetative cover as fast as possible and maintain it for as long as possible.

There are two central challenges to meet in this scenario: 1) getting the seed into the ground and 2) selecting a highly vigorous species that will germinate and establish very quickly.

To accomplish the first goal, either use a no-till drill or do some light tillage work in the area to be seeded. Unless the soil is somewhat disturbed, broadcasting seed onto such areas will not give satisfactory results.

Several valid forage options exist for these areas. The ryegrasses (perennial and annual) are the most vigorous in establishment and growth followed by orchardgrass, tall fescue, and bluegrass in that order. Annual ryegrass has the fastest emergence and growth but does not last. Perennial ryegrasses are

nearly as fast to emerge and grow as the annuals and will last longer in Kentucky conditions. (Perennial ryegrass can have an endophyte similar to that in tall fescue. Make sure that any perennial ryegrass used is endophyte free.)

Based on the assumption that animals cannot be kept off these areas for substantial lengths of time, the most effective method of getting grass cover may be drilling perennial ryegrass into these areas every other year or annual ryegrass every year. Mixing some orchardgrass, tall fescue, or bluegrass seed with ryegrass (either annual or perennial) may give some longer-lasting cover in these areas, but it is probably more practical just to use ryegrass alone.

Mulching newly seeded areas with straw and then irrigating to keep soil moist will speed up grass emergence and establishment.

Recommended Pasture Management for Horses

The following management practices will promote vigorous, healthy plant growth and also extend the pasture's productive life.

Grazing Management

Divide the total acreage into paddocks so that it will be possible to rotate among them. The amount of time necessary to permit forage regrowth and increase plant vigor varies with stocking rate, time of year, rainfall, and the forage species present. In most cases, a rotational grazing program is based on 2- to 4-week rest periods.

Horses should be removed from a pasture when tall fescue and orchardgrass are 4 inches in height and Kentucky bluegrass and bermudagrass are 2 inches in height. Legumes are less sensitive to grazing height than grasses but will be weakened by close, continuous grazing.

Pregnant mares should be removed from endophyte-infected tall fescue pastures 2 to 3 months prior to foaling.

Close grazing favors bluegrass and bermudagrass over tall fescue and orchardgrass. There is more leaf area close to the ground (and below the grazing height) with bluegrass and bermudagrass, which provides energy for pasture regrowth. Try to avoid continuous, close grazing of any one area because this quickly reduces the amount of legume in the stand and increases the presence of weeds. On the other hand, lax grazing pressure allows the forages to mature and become less palatable and nutritious. If the grass is beginning to head, consider making hay or clipping that acreage.

Horses may selectively graze one forage species in preference to another and may avoid eating forage soiled with manure. One solution to such uneven grazing would be to follow the horses with other species of livestock (if you have them) because they will often graze what horses ignore.

Avoid grazing newly seeded areas when the soil is wet and muddy, as the horses' hooves can cause damage to the small forage seedlings. A holding area or dry lot is recommended for such situations.

Clipping Pastures

After grazing, pastures may be mowed to promote uniform leafy regrowth and a more pleasing appearance. Clipping is also beneficial since pasture regrowth is more palatable and nutritious than mature plants. Clipping also helps reduce weed pressure and the risk of eye irritation caused by mature seed heads.

Annual Fertilization

Nitrogen fertilizer will be needed each year in any predominantly grass pasture. The amount of N applied will depend on the yield goal for each field. Nitrogen will cause cool-season grasses to thicken up, especially if applied in late fall. To revitalize a stand of grass, make sure the grass is short in August-September. Exposing the bases of cool-season grasses to sunlight in the early fall stimulates the formation of new shoots. Apply 50 to 60 lb N/A in November or December. Nitrogen fertilization encourages the growth of these new tillers. Ammonium or nitrate forms of nitrogen are preferred over urea for fall fertilization because some urea is lost to volatilization. If urea must be used, increase the rate by 15 percent to account for the loss.

Prior to winter, graze or clip the fall growth to a height of 6 inches or less for tall fescue or orchardgrass and 4 inches for bluegrass. Excessive top growth of cool-season grasses going into the winter will lead to a buildup of disease underneath the thatch and will cause "clumpiness," especially in tall fescue and orchardgrass.

Phosphorus and potassium should also be applied as needed according to the type of pasture. The timing of the application is not critical.

Periodic Soil Testing

Pastures should be soil tested about every 3 to 4 years to determine the need for additional lime and fertilizer. To maintain legumes in the pasture, the soil pH, phosphorus, and potassium levels must be kept at recommended levels for the species present. For example, clovers in Kentucky require a soil pH of 6.4 to 6.8, soil P (phosphorus) of 60 lb/A, and soil K (potassium) of 300 lb/A.

Weed Management

The best weed control in pastures is a strong, actively growing stand of grass. Fertilization (especially nitrogen), timely mowing, and good grazing management will also help keep weed pressure down. Herbicides are available for pasture use, but there are often trade-offs in their use. For example, 2,4D and other herbicides labeled for use on pastures will control broadleaf weeds but will also kill or severely stunt any clover present. Herbicide labels often require that horses be removed from a treated pasture for some specified length of time after spraying. (For some pull-off times for herbicides, see AGR-172, *Weed Management in Grass Pastures, Hayfields, and Fencerows*).

A properly managed pasture that is not overgrazed and is well fertilized should not allow weeds to predominate. However, if this does occur, apply appropriate herbicides in the weed-infested areas. Always read and follow herbicide label recommendations.

Related University of Kentucky Publications

- AGR-1 Lime and Fertilizer Recommendations
- AGR-18 Grain and Forage Crop Guide for Kentucky
- AGR-26 Renovating Hay and Pasture Fields
- AGR-33 Growing Red Clover in Kentucky
- AGR-58 Orchardgrass
- AGR-59 Tall Fescue
- AGR-64 Establishing Forage Crops
- AGR-76 Alfalfa: The Queen of Forage Crops
- AGR-84 Timothy
- AGR-93 Growing White Clover in Kentucky
- AGR-151 Evaluating Fertilizer Recommendations
- AGR-172 Weed Management in Grass Pastures, Hayfields, and Fencerows
- AGR-175 Forage Identification and Use Guide
- PR-Series Progress reports of current forage variety trial results for yield and grazing tolerance

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