

Strategies for Reclaiming Hay Feeding Areas

Chris D. Teutsch and Kelly M. Mercier, Plant and Soil Sciences

Hoof damage from livestock during the winter months can result in almost complete disturbance of desired vegetation and soil structure in and around hay feeding areas. Even well-designed hay feeding pads will have significant damage at the edges where animals enter and leave. Highly disturbed areas create perfect growing conditions for summer annual weeds like spiny pigweed and cocklebur. Weed growth is stimulated by lack of competition from a healthy and vigorous sod and the high fertility from the concentrated area of dung, urine, and rotting hay. The objective of this publication is to outline strategies for rapidly establishing stands of desirable forage species on these areas. Regardless of the reclamation strategy that is employed, it is important to create an environment that will allow seeds to germinate quickly and uniformly, resulting in rapid canopy closure. The best defense against summer annual weeds is covering the soil with a desirable forage species. Desirable cover inhibits weed seeds from germinating and allows the desirable forage to actively compete with weeds that have already germinated. Creating this environment starts with making sure that soil fertility is in the medium to high range, soil pH is 6.0 to 6.4, and preparing a fine, but firm, seedbed.

Soil test and adjusting fertility. Damaged areas should be soil tested, and lime and fertilizer applied as needed. In most cases, fertility will be high in hay feeding areas due to high concentrations of dung, urine, and rotting organic material. However, a soil test will allow you to confirm nutrient levels and soil pH and determine if lime and fertilizer are needed.

Reseeding damaged sods. In most cases, hay feeding areas will need complete renovation. After hay feeding is completed and cattle have been moved onto pastures, reclaiming these areas can begin. In most cases, these areas will need to be harrowed to smooth and level. The



Figure 1. Excessive rainfall and high livestock concentration in and around hay feeding areas can result in almost complete disturbance.

goal should be to produce a fine, but firm, seedbed that will enhance soil-to-seed contact, which is essential for rapid germination and uniform emergence of the seeded forage crop. A general rule is that if you walk across a prepared seedbed and sink in past the sole of your shoe, it needs to be refirmed by cultipacking or waiting for a rain prior to seeding.

STRATEGY 1: Planting Cool-season Grasses and Legumes

The first strategy is to seed cool-season grasses or a mixture of grasses and legumes in the spring. While this is commonly done, results are usually less than spectacular in most years. Seedlings are normally delayed until late spring or early summer. Consequently, seedlings do not have adequate time to develop a large enough root system to sustain them through a hot, and often dry, summer. The second reason is that summer annual weed pressure is usually very high. Summer annuals weeds like foxtail, crabgrass, goosegrass, spiny pigweed, cocklebur, and others actively compete with cool-season seedlings for light and water, often causing stand failures.

If a spring planting of cool-season grasses and legumes is attempted, there

Key Points

- Re-establishing desirable and productive forage species can suppress weed growth and provide high quality grazing or stored feed.
- Correct soil fertility and pH as needed and prepare a fine, but firm, seedbed.
- Use the high end of seeding rates and control broadleaf weeds.
- **Strategy 1:** Plant adapted cool-season perennial grasses in early to mid-March
 - Plant *no deeper* than a half-inch in two directions using the high end of seeding rates.
 - Delay planting legumes until the following winter to allow use of broadleaf herbicides.
 - Clip or flash graze to reduce weed competition.
- **Strategy 2:** Plant adapted warm-season annual grasses in late-spring once soil is 60°F.
 - Graze crabgrass at 6-8 inches and all other tall-growing summer annuals at 18-24 inches.
 - Apply 60 lb. N/A at seeding and 40-60 lb. N/A after each harvest/grazing, except for the last.
 - Kill summer annual pasture and any weeds with non-selective herbicide and no-till perennial cool-season forages in late summer-early fall.

are several things that can be done to enhance, but by no means guarantee, success. These are listed below.

Plant adapted forage species. Plant forages that are well adapted to Kentucky and the soils and drainage found on your farm. Tall fescue, red clover, and ladino clover are, by far, the best adapted and most versatile forage species for pastures in the Commonwealth. Other cool-season perennial grasses that could be included in a mixture include orchardgrass, Ken-

tucky bluegrass, and perennial ryegrass (Table 1). If this area will be used for hay feeding again, then investment in novel endophyte tall fescue varieties is not recommended. More information on forage species that are adapted to Kentucky can be found in AGR-18: *Grain and Forage Crop Guide for Kentucky*. Information on the best adapted varieties for Kentucky can be found on the University of Kentucky Forages webpage.

Consider leaving legumes out of the mix.

While legumes are an important part of grassland ecosystems, herbicide options for controlling weeds in grass-legume mixtures are limited. Leaving legumes out will allow you to apply selective herbicides to control broadleaf summer annual weeds. For specific herbicide recommendation, you can visit with your local Extension agent.

Use the high end of the recommended seeding rate. Seeding rates are normally given as a range (Table 1). For spring seedings, make sure and use the high end of this range. Rapid canopy closure is critical to suppressing summer annual weeds.

Plant as early as possible. Spring seeded cool-season forages should be planted starting in early to mid-March. Early plantings will have more time to emerge and form a canopy that can shade summer annuals weeds. Early planted grass seedlings will also have additional time to develop a root system that can sustain the new planting during the summer months.

Plant in two directions. If drilling, cut seeding rates in half and plant in two directions. This will aid in obtaining quicker canopy closure, helping to reduce the germination of weed seeds.

Check seeding depth. Small seeded cool-season forages should not be planted deeper than a half-inch. Make sure to check and recheck your seeding depth. Seeding deeper than a half-inch will delay emergence, result in uneven stands, and in many cases cause complete stand failure.

Control broadleaf weeds in cool-season grasses. Once seedlings have four collared leaves, some herbicides can be applied. Always consult and follow label directions. For the most up to date information on using herbicides on new seedings, contact your local Extension agent.

Clip or flash graze new stands. Summer annual weeds compete very aggressively for light, water, and nutrients with cool-season grass seedlings. If not controlled, plantings will likely fail. The most effective control of competition is to flash graze paddocks before weeds get well established. Flash grazing is accomplished by placing a large number of animals in small areas for a short period of time. This reduces selective grazing and increases grazing uniformity.

**STRATEGY 2:
Planting Warm-season
Annual Grasses**

The second strategy involves planting a summer annual grass in late spring or early summer. This strategy has a much higher probability of success than planting cool season grasses in late spring. Summer annual grasses, especially sorghum-sudangrass or sudangrass, have very rapid emergence and canopy closure. This will prevent summer annuals weeds from germinating and provide forage for grazing or harvesting during the summer months (Figure 2). Perennial cool-season grasses can then be reseeded under more ideal conditions in late summer or early fall.

If summer annuals grasses are used, there are several things that can be done to enhance success. These are listed below.

Plant adapted summer annuals species. Always plant forages that are well adapted to Kentucky and the soils and conditions on your farm. Summer annuals that can be used to reclaim hay feeding areas include sudangrass, sorghum-sudangrass, pearl millet, and crabgrass. These species are described below and more information on their establishment and management can be found in the corresponding links.

Sudangrass is a rapidly growing annual grass of the sorghum family. It is medium yielding and well suited for grazing (Figure 3). Sudangrass regrows quickly after harvest and can be grazed several times during summer and early fall. This grass is better suited for hay production because it has finer stems, especially at high seeding rates. For more information, see AGR-234: *Sudangrass and Sorghum-sudangrass Hybrids*.

Table 1. Seeding rates for perennial cool-season forage species planted alone or in a mixture.

Species	Seeding Rate (lb/A)	
	Alone	In a Mixture
Tall fescue	20-25	10-15
Orchardgrass	15-20	6-8
Perennial ryegrass	20-25	10
Kentucky Bluegrass	NR ¹	4-6
Red clover ²	NR	6-8
White clover ²	NR	1-2

¹ NR, not recommended

² Do NOT include red and white clover if herbicides will be used to control broadleaf weeds.

Sorghum-sudangrass hybrids are developed by crossing sorghum with true sudangrass. The result is a tall growing annual grass that resembles sudangrass, but has larger stems, taller growth habit, and higher yields. Like sudangrass, hybrids will regrow after grazing if growth is not limited by environmental factors. The larger diameter stems are difficult to cure as dry hay. Therefore, these grasses are best utilized for grazing, chopped silage, and baleage. For more information, see AGR-234: *Sudangrass and Sorghum-sudangrass Hybrids*.

Pearl millet is not related to foxtail millet and is higher yielding. It will regrow after harvest, does not have prussic acid potential, and is not a host of the sugar cane aphid (Figure 4). Dwarf varieties are available which are leafier and better suited for grazing. Pearl millet is better adapted to more acid soils and soils with a lower water holding capacity than sorghum, sudangrass or sorghum-sudangrass hybrids. For more information, see AGR-231: *Pearl Millet*.

Crabgrass is sometimes considered a weed, but possesses significant potential for supplying high quality summer forage (Figure 5). Crabgrass does not have prussic acid potential and is a poor host for the sugarcane aphid. Crabgrass is the general term for many Digitaria species and is well adapted to Kentucky, highly palatable, a prolific reseed, and is best utilized by grazing. Planting an improved variety of crabgrass is recommended because the production of naturally occurring ecotypes varies greatly. For more information, see AGR-232: *Crabgrass*.



Figure 2. Sorghum-sudangrass (left) formed a quick canopy that was able to shade out summer annual weeds compared with forage (right).



Figure 3. Sudangrass and sorghum-sudangrass hybrids rapidly emerge from the soil and shade out summer annual weeds.



Figure 4. Pearl millet is not quite as vigorous as sorghum-sudangrasses.

Use the high end of the seeding rate. Seeding rates are normally given as a range. (Table 2). Make sure and use the high end of this range. Even with summer annuals, rapid canopy closure is critical for reducing unwanted weed competition.

Plant after soil warms. For summer annual grasses to germinate and rapidly emerge, soil temperatures at planting should be at least 60 degrees Fahrenheit. This should allow plenty of time to let hay feeding areas dry out and to get them smoothed up prior to planting. If there is a delay in planting the summer annuals after final tillage, it may be a good idea to do one more pass of light tillage to disturb any weed seedlings that may have germinated.

Control broadleaf weeds. Once warm-season annual grasses are established, some herbicides can be applied to control summer annual broadleaf weeds. If cool-season perennials are to follow in the fall, make sure and check the label for reseeding restrictions prior to application. Always consult and follow label directions. For more information on using herbicides on summer annual grasses, contact your local Extension agent.

Grazing summer annual grasses. Allow taller growing summer annuals like sorghum-sudangrass and pearl millet to reach a height of 18-24 inches before grazing and stop grazing at to 8-10 inches. Regrowth can be stimulated by

applying 40-60 lb. N/A after each grazing but the last. Crabgrass can be grazed once it reaches a height of 6 to 8 inches. Cattle should be pulled off once it has been grazed to a height of 3 to 4 inches. Detailed management recommendations on for individual summer annual species can be found in AGR-229: *Warm-season Annual Grasses in Kentucky*.

Haying summer annual grasses. Allow taller growing summer annuals to reach a height of 30 to 40 inches before mowing. This will optimize yield and forage quality. If regrowth is desired, do not mow closer than 6 inches. Apply 40 to 60 lb. N/A after each cutting, but the last. Crabgrass should be cut for hay at the late boot-stage. Care should be taken to not mow crabgrass closer than 3 to 4 inches. With the taller, thicker stemmed species, a crimping mower-conditioner will help the crop dry to safe baling moistures, although this may take some time. Ideally, summer annuals should be conserved as chopped silage or baleage.

Reseeding cool-season grasses in the fall. Pastures with summer annuals should be sprayed with a non-selective herbicide in late summer to control any remaining summer annual grass and any weeds that have germinated. Use a no-till drill to plant cool-season grasses into the killed pasture area. More information on forage establishment can be found in AGR- 64: *Establishing Forage Crops*.

Table 2. Seeding rates for commonly planted summer annual grasses in Kentucky.¹

Species	Seeding Rate (lb/A)
Sorghum-sudangrass	30-40
Sudangrass	15-20
Pearl millet	15-20
Crabgrass	4-6

¹ A small amount of crabgrass, 2-3 lb/A, can be seeded with the taller growing summer annual species to fill in thin spots in the stand that may develop.



Figure 5. Crabgrass is often considered a weed, but can provide high-quality summer grazing.

For more information on renovating pastures and no-till seeding techniques visit UK Forage Extension website at <http://forages.ca.uky.edu/> or contact your local Extension office.