DIVISION OF AGRICULTURE
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Chapter 12

Fall and Winter Grazing of Wheat

Paul Beck and John Jennings

Growing wheat for pasture can provide high-quality forage for up to 6 months of the year. The longevity and quality of production depend on factors such as planting date, environmental conditions, animal stocking rate, variety and both the previous and current fertility programs. Forage quality is adequate for growing calves to gain over 2.5 pounds per day if adequate forage is available. Wheat pasture is extremely high in crude protein (>25%) and low in fiber (40% to 49% neutral detergent fiber and 20% to 30% acid detergent fiber), which leads to digestibility that is more similar to feed grains than other forages.

Seeding Rate

Plant wheat at a rate of 1½ to 2 bushels of pure live seed (PLS) per acre when using as a dual-purpose crop (grazing and grain) to ensure the proper stand density for grazing.

Soil Selection

Well-drained soils that provide a solid footing for grazing animals during wet periods are essential to the success of any winter pasture program. Wheat grows well on a wide range of soils, provided they are properly limed and fertilized. It can even be grown on many shallow and sandy soils because of the favorable supply of rainfall during the growing season.

Seeding in Dedicated Crop Fields

Seeding for grazing is recommended in dedicated crop fields in early September in northern Arkansas and early to mid-September in southern Arkansas. If rainfall patterns are erratic in late summer and early fall, these dates may be too early, and planting should be delayed until soil moisture is adequate. Lime and mixed fertilizer should be applied according to soil tests and incorporated prior to seeding. Wheat may be either drilled or broadcast and covered by disking but should not be planted more than 1 to 1½ inches deep.

Figure 12-1. Feeder calves grazing wheat.

Complete seedbed preparation may consist of chiseling and heavy disking, followed by light disking and smoothing. Environmental conditions between tillage and planting can greatly impact planting date. On prepared seedbeds, wet weather can delay planting 2 to 3 weeks, and dry conditions may delay planting until soil moisture conditions are favorable for seed germination.

No-till planting of wheat for grazing in dedicated crop fields has been shown to have advantages over a clean-tilled prepared seedbed including reduced cost, reduced runoff of water and nutrients, and improved footing in wet conditions. Additionally, no-till establishment of wheat

in the fall is not delayed by either dry or wet conditions as badly as in prepared seedbeds because of improved retention of soil moisture and better infiltration of rainfall. Fall forage production has been shown to be equivalent in no-till and prepared seedbeds if conditions for planting allow for timely planting. Planting delays in prepared seedbeds may reduce fall forage production.

Overseeding Into Warm-Season Grass Sod

Planting wheat into an existing grass sod is usually termed "sod seeding," "interseeding" or "overseeding." This practice can provide excellent winter pasture from wheat seeded in mid- to late September in northern Arkansas and early to mid-October in southern Arkansas. Planting should be done when fall soil moisture is adequate and warm-season grass growth has slowed. On permanent sods, any growth above 2 inches should be removed by close grazing or cutting hay just before seeding. It is important that the permanent grass growth rate is slowed or stopped before planting because the permanent pasture will outcompete wheat seedlings for sunlight, moisture and nutrients, causing a stand failure.

Later planting dates result in lower fall forage production, but early planting dates have been successful in bermudagrass pastures if a low rate of glyphosate (1 pint per acre) or paraquat is applied in early September to force bermudagrass into dormancy. Compared with overseeding in October, application of glyphosate prior to planting in September increased fall forage production by 60%, increased steer average daily gain by 26% and increased gain per steer by 63%.

No-till drills are excellent tools for overseeding pastures. With many of these implements, starter fertilizer can be applied near the seed. This system has multiple benefits, such as allowing grazing of land for longer periods of time during the year and ensuring better footing for grazing animals during wet conditions. But because the summer growth of the existing grass sod uses soil moisture and nutrients and planting dates are delayed, overseeding into grass sod results in lower fall forage production than planting in dedicated crop fields.

Broadcast Seeding With Fertilizer – Another way of overseeding is to mix seed with fertilizer and broadcast, followed by disking to cover the seed. The disk can be set at the angle desired to cut the sod to the proper seeding depth. Broadcast seeding and disking are usually faster, but a sod planter or grassland drill usually ensures a quicker and better stand. Disking lightly or harrowing and/or cultipacking after seeding helps ensure good soil-seed contact for quick germination. Ideally, 50% to 60% of the soil should be exposed by disking after seeding. One major drawback to this seeding technique is the poor distribution of seed. This can be partially overcome by cross-seeding or by overlapping seeding swaths.

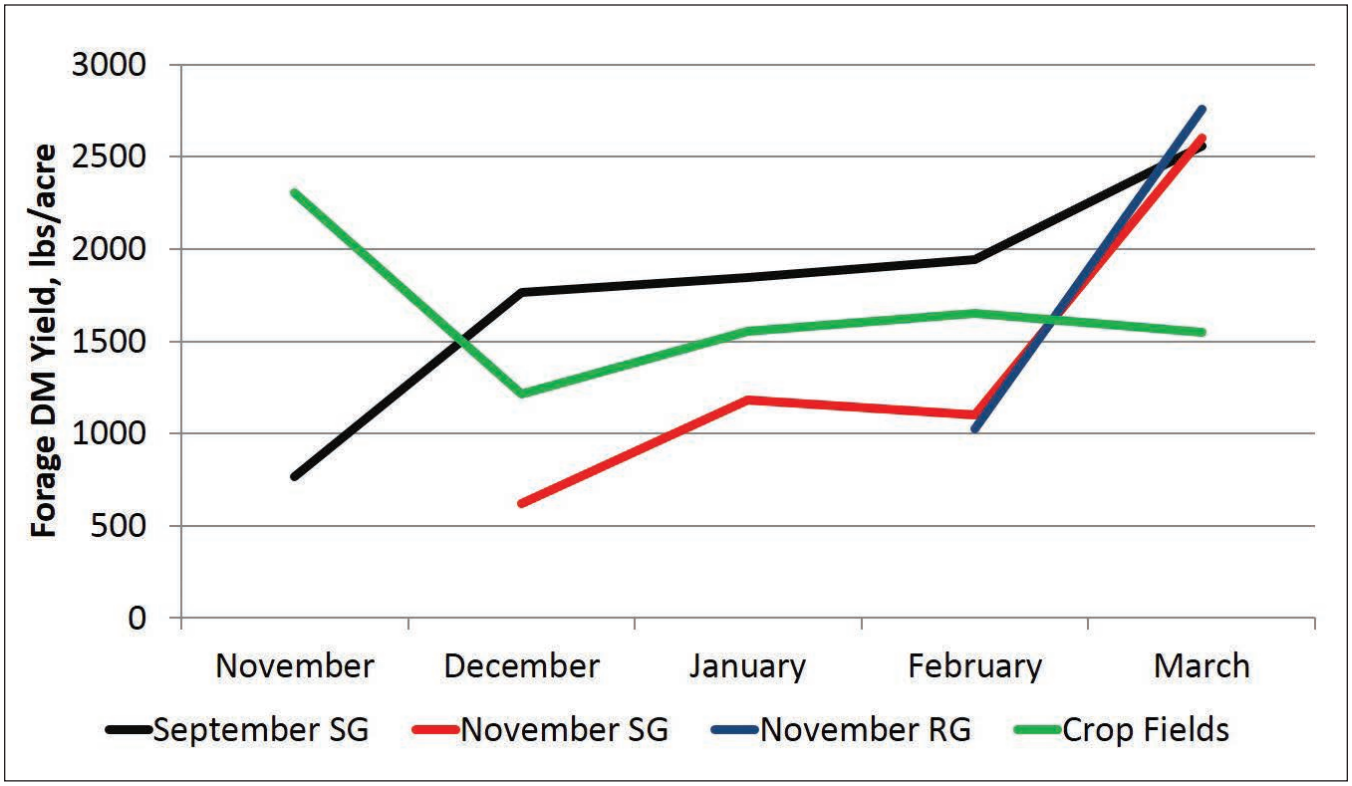
Aerially seeding wheat into standing soybeans or cotton can provide early forage. Stand establishment is highly dependent on soil moisture and rainfall after seeding, so this is not as reliable as other seeding methods.

Potential Forage Production

Wheat is well-suited to fall and winter production. Total production of wheat ranges from 1 to 5 tons of forage per acre on a dry matter basis through the fall and spring, depending on planting date and climatic conditions. The seasonal distribution depends on the variety, fertilization regime and weather conditions. Nitrogen fertilizers should be applied according to the conditions of the growing season. Fall production may range from none to a ton of dry forage per acre while winter production usually ranges from less than 500 pounds to as much as a ton per acre. Spring production may vary from less than one-half to 3 tons per acre. However, when producing grain, most of the spring growth must be allocated toward grain production. Remove cattle at the first appearance of the first internode (Feeke's growth stage 6) for acceptable grain production.

Fall forage production is the limiting factor for when cattle can be allowed to graze wheat forage in the fall. Figure 12-2 shows the yield of available forage of cool-season annual pasture planted at the LFRS (Livestock and Forestry Research Station near Batesville) and SWREC (Southwest Research and Extension Center at Hope) in the fall of 2011. Crop fields at the LFRS at Batesville (green line) were planted during the first week of September. These fields were planted to wheat using either conventional clean tillage methods or no-till. By November these pastures produced an average of 2,250 pounds of forage DM/acre. Compare these yields to that of small grains (wheat or cereal rye mixed with ryegrass) interseeded into warm-season grass sod (black line) from mid-September to mid-October. These fields only produced about 750 pounds of forage DM/acre by November and were not ready to be stocked with calves until December. This reduction in forage production and later stocking date was because planting dates were delayed with interseeding and the previous

Figure 12-2. Forage DM yield per acre of cool-season annual grasses planted at different dates and conditions at the University of Arkansas SWREC and LFRS during the fall of 2011.



use of nutrients and moisture by the permanent pasture. When interseeding was conducted in November (red line), which incidentally was the planting date if a producer waited to plant in ideal conditions following a rain, stocking was delayed until January. In that case soil conditions were ideal, but cooler temperatures and fewer growing days decreased the potential forage production. And finally, if only ryegrass was planted at the November planting date (blue line), stocking was delayed until February, which emphasizes the importance of including wheat or other small grains in cool-season annual plantings. These data are from only one year, but it is an excellent example of how seemingly short delays in planting can have large impacts on forage growth and subsequent animal grazing.

Fertilization

Nitrogen application is recommended for all small grains and cool-season grasses at planting or shortly thereafter. Apply lime, phosphorus and potassium according to soil test recommendations at planting. Sulfur and/or magnesium fertilizer may be needed on some soils. Sixty pounds of actual nitrogen (180 pounds of ammonium nitrate or 135 pounds of urea) per acre is generally considered enough to produce a ton of cool-season forage. Thus, the heavier rates of nitrogen recommended for wheat on a prepared seedbed should be enough to produce 4 tons of dry forage per acre. Nitrogen rates above 200 pounds per acre will not greatly increase production and could cause the forage to be toxic to livestock from high nitrate concentration. Research has indicated that nitrogen should be applied at the rate of 60 pounds per acre in August/September, February/March and April/May for optimum production for grazing. When producing wheat for grain, apply the final nitrogen soon after the cattle have been removed.

Grazing Management

Wheat production is highest during extended warm periods when temperatures are above 55°F. Weather conditions will not permit much growth of winter annuals after December 1. Thus, some growth reserve is necessary if you expect to have forage available for grazing during the winter months.

Short grazing periods (2 hours) stimulate milk production in dairy cows almost as much as all-day grazing on winter pastures. Rotational grazing is critical on wheat pastures to allow the forage to accumulate growth during each warm period. This extends grazing over a longer period. Wheat should never be grazed closer than 2 inches and

Figure 12-3. Calves grazing wheat pasture.

should not be grazed until it reaches a plant height of 5 to 8 inches. Wheat should also be well-rooted and well-tillered before grazing begins.

The forage production of cool-season annual grasses follows a biphasic production curve in which productivity during the fall and winter is at a much lower level than during the spring. Thus, stocking rates are necessarily much less in the fall and winter from early November to late February (1 to 2 acres per calf) than in the spring from late February to early May (2 to 3 calves per acre). Stocking rate is a fundamental variable for managing pastures, and there is a distinct relationship between stocking rate and animal performance for each forage type. Research from Oklahoma indicates that steers' dry matter intake and thus performance is limited on wheat pasture that has less than 1,100 pounds of forage dry matter per acre. Thus, pastures should not be stocked with livestock until forage production has at least reached this level.

In order to determine the forage allowance that would result in the optimal stocking rate for fall and winter grazing of cool-season annual pastures, the wheat forage production and steer performance from 10 years of experiments at SWREC and LFRS were used to determine the response of average daily gain (ADG) to forage allowance (pounds of forage DM per pound of calf bodyweight). Managers are faced with decisions regarding stocking rate at the beginning of the grazing season with only the forage produced up to that point to consider in setting the stocking rate. The response of ADG to the initial forage allowance indicates that a maximum ADG of 2.7 pounds per day could be expected at 5 pounds forage DM per pound of initial calf bodyweight, and ADG of 2 pounds per day could be expected at an initial forage allowance of approximately 2.4 pounds of forage DM per pound of initial calf bodyweight.

When determining the stocking rate for calves being placed on cool-season annual pasture, care should be taken to ensure that forage growth has at least reached 900 to 1,000 pounds of forage dry matter per acre. Additionally, the stocking rate should be set so that animal production goals are met. If gains of at least 2 pounds per day are desired, then calves should be allowed at least 2.4 pounds of forage DM per pound of animal bodyweight. Therefore, if 500-pound calves are to be placed on cool-season annual pasture, then it would require approximately 1.2 acres per calf of pastures containing 1,000 pounds of forage DM per acre. An easy-to-gauge rule of thumb is that there are approximately 200 pounds of forage DM per acre for every inch in plant height. Therefore, to reach the goal of 1,100 pounds of forage DM per acre, pastures should not be stocked until they reach at least 5 to 6 inches in height.

The most efficient method for using wheat pasture is by rotational or strip grazing. These forms of grazing management improve forage use efficiency over continuous grazing by 15% to 20% with little effect on animal performance.

Bloat

The disadvantages of cool-season annuals are few and easily controlled with management and nutrition. These forages can be bloat-provocative when forage is lush. Bloat is caused when the rapidly degradable soluble protein and sugars are released from the plant cell in the animal rumen. These can cause a stable foam matrix to form on the top of the mat of rumen contents. As fermentation gases pass through this matrix, it causes a foam to form that is not easily disrupted by ruminal contractions. Calcium deficiencies can be a contributing factor in bloat causing ruminal contractions to be less frequent and weaker. The incidence and severity of bloat is easily reduced by providing a supplement containing Rumensin (monensin sodium, Elanco Animal Health). If, and when, bloat is observed, Bloat Guard (poloxalene) supplements can be provided as a treatment. This provides the benefits of improved rate of gain of about ¼ pound per day for grazing stocker calves supplied with Rumensin and provides an avenue to rapidly respond when bloat is present. Both Rumensin and poloxalene are labeled for self-feeding to growing cattle. Other ionophores can be used to improve animal performance, but only Rumensin has been shown in research settings to decrease the incidence and severity of wheat pasture bloat.