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Stockpiling for Fall and Winter Pasture

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Many cattle producers can take advantage of the late summer-fall growing conditions to obtain high-quality pasture for fall and early winter grazing. This practice is called stockpiling. Management decisions for optimum stockpiling include selecting grass species, timing, fertilizing, grazing management or utilization, selecting classes of cattle, and designing grazing systems for efficient utilization.

Grasses to Stockpile

The best grass for stockpiling is a cool-season grass that will retain its green color and forage quality later into winter. In addition, the grass should be somewhat resistant to low temperatures and have the capabilities of forming a good sod. Kentucky has two adapted grasses that have these characteristics: tall fescue and Kentucky bluegrass. Tall fescue produces more fall and winter growth than bluegrass (Table 1).

Table 1. Yield and crude protein content of Kentucky bluegrass and tall fescue produced from Aug. 15 to Dec. 1 under different levels of N fertilization at Lexington (average of three years).

Nitrogen Applied	Bluegrass		Fescue	
lb/acre	Yield lb/acre	% Protein	Yield lb/acre	% Protein
0	700	12.8	1700	11.1
45	1600	15.5	2800	11.8
90	2100	19.1	3900	14.8

Source: Taylor, T.H., and Templeton Jr., W.C. 1976. Agron. J. Vol. 68, Mar-Apr.

Time to Begin Stockpiling

Late July-early August is the time to begin stockpiling for fall and winter use. Remove cattle in late July or early August, apply necessary fertilizer, and allow the grass to accumulate growth until November or December. Make sure that summer growth has been removed to 3 to 4 inches by grazing or clipping so that stockpile production comes from new grass regrowth.

During the stockpiling period, August 1 to November 1, other available forages such as sorghum-sudan hybrids, sudangrass, bermudagrass, grass-lespedeza, and grass-clover should be used. After frost, alfalfa-grass and clover-grass growth should be grazed first before moving to grass fields.

Fertilizer Needed

A soil test should be taken to determine the phosphorus, potassium, and lime necessary. Nitrogen should be topdressed at the rate of 40 to 60 pounds of actual N per acre on bluegrass and 40 to 100 pounds on tall fescue. When N was applied August 15 and yields were taken in December, Kentucky researchers have shown that bluegrass fertilized with 45 pounds of nitrogen per acre had a yield increase of 20 pounds of dry matter for each pound of nitrogen applied. In the same study, tall fescue showed an even greater nitrogen use efficiency with 24.4 pounds of dry matter produced for each pound of nitrogen applied. Additional studies have shown that the greatest yield increases occur when N application occurs soon after August 1 (Table 2). Nitrogen applications before August 1 may encourage the growth of summer grasses such as crabgrass and foxtail and subsequently reduce the production of bluegrass and tall fescue. Source of nitrogen will also influence N use efficiency with urea 79 to 89% as effective as ammonium nitrate on an equivalent nitrogen basis (Table 3).

Table 2. Effect of time of nitrogen application on production efficiency of KY 31 tall fescue.

Date N Applied	Nitrogen Efficiency lb DM*/lb N added
Aug 1	27.2
Aug 15	25.8
Sep 1	19.2
Oct 1	10.8

*Dry matter.

Source: Murdock, Lloyd W. 1982. Agronomy Notes. Vol. 15, No. 2, April 1982.

Table 3. Pounds of tall fescue 10 weeks after N application.

Application Date	lb/acre %			
	None	Ammonium Nitrate	Urea	U/N*
Early August	786	1683	1406	84
Mid-August	741	1438	1287	89
September	372	1076	852	79

*Efficiency of urea compared to ammonium nitrate.

Source: University of Kentucky.

These studies show that with wise use and timing of fertilizer, high production can be obtained during fall and early winter. The sugar content and digestibility of tall fescue are also better during fall-early winter than any other time of the year. This increased quality in the fall has been shown in many studies including the data in Table 4 from the University of Kentucky.

Table 4. Seasonal percentage changes in chemical composition and digestibility of tall fescue.

	Spring	Summer	Fall
Sugars	9.5	8.5	19
Protein	22	18	19
D.D.M.*	69	66	74

*Digestible dry matter.
Source: Buckner, R.C. 1975. Univ. of Ky. Coop. Ext. AGR-44.

Utilization of Stockpiled Forages

After frost, be sure to graze the grass-legume fields quickly before the plants deteriorate. After these fields are grazed, the stockpiled grass field or fields should be grazed. Light stocking will cause a lot of waste as a result of trampling. To make most efficient use of the high-quality feed in stockpiled fields, install a temporary electric fence across the field dividing it so the area to be grazed first has a source of water and minerals. Once the animals have grazed this area off, move the fence back, opening up a new strip. Repeat this system until the entire field is grazed.

What Classes of Cattle Benefit the Most From Stockpiled Grasses?

Stockpiled grass is an excellent choice for fall-calving cows. It can be used after calving and during the breeding season when their nutritional needs are greatest.

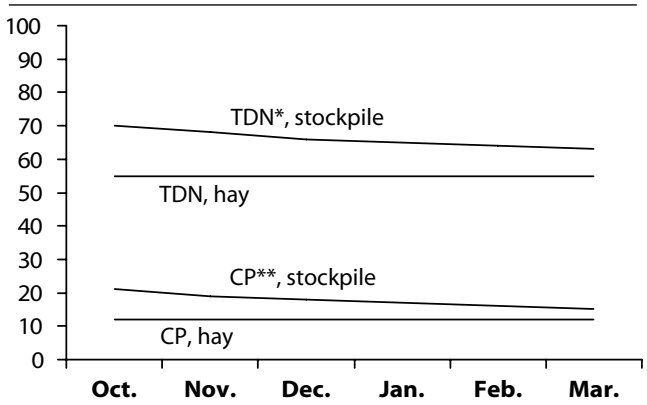
Spring-calving cows may benefit most from grazing stockpiled grasses if they are in thin body condition in the fall. They can regain condition while grazing and be in better shape going into the winter. Spring-calvers in mid-gestation that are in good body condition may not need as high a quality of feed and could use lower-quality feed. Over-conditioning cows in late gestation may increase birthweight of their calves.

Growing, weaned cattle can also be grazed on stockpiled fescue. Backgrounders can lower the feed costs of their operations by utilizing stockpiled grasses.

Animal Performance on Stockpiled Tall Fescue

The high quality of stockpiled tall fescue (Figure 1) produces good gains on both weaned stock and mature cows. These gains are a response to the high crude protein and digestibility of the fall growth of tall fescue. In particular, the sugar content rises to very high levels in response to lower temperatures and shortening day length. This nutritional change does not take place overnight due to the first frost but is spread over time.

Figure 1. Quality of stockpiled fescue versus hay on nine Arkansas farms.



* Total digestible nutrients.
** Crude protein.
Source: University of Missouri.

Calf Gains

Several factors affect gain of calves grazing fall stockpiled tall fescue, including the endophyte status of the fescue and the length of the grazing period. The presence of the fescue endophyte will decrease gain (Table 5) even with the cooler temperatures of fall. Calves grazing endophyte-infected stockpiled fescue gained 1.49 pounds daily in a Kentucky trial and 1.85 pounds in an Oklahoma trial (Table 5). Calves on endophyte-free tall fescue in the same trials gained 2.17 lb/day in Kentucky (45% increase) and 2.47 lb/day in Oklahoma (34% increase). In comparison, clover mixed with endophyte-infected tall fescue increased gains by only 9% in Oklahoma. In other studies where calves were grazed from early November to mid-December on endophyte-infected stockpiled tall fescue, gains ranged from 0.97 to 2.13 lb per day (Table 6). In conclusion, calf gains are higher when grazing endophyte-free tall fescue, but the detrimental effect of endophyte-infected tall fescue is much lower with late fall grazing in comparison to summer grazing.

Table 5. The effect of the endophyte on calf average daily gain (ADG) when grazing stockpiled tall fescue.

	ADG, lb	
Endophyte Level	Kentucky, 1986	Oklahoma, 1986
E+	1.49	1.85
E-	2.17	2.47
E+ and Clover	---	2.02

Table 6. Average daily gain (ADG) of calves grazing stockpiled tall fescue.

Trial	Grazing Days	ADG, lb
KY, 1982	59	1.27
KY, 1985	57	1.15
KY, 1986	56	2.00
OK, 1986	42	2.13
KY, 1990	63	0.97
IL, 1992	56	1.76

Cow Gains

Another area where stockpiled tall fescue is helpful to the livestock producer is by extending the grazing season for the cow herd, thereby decreasing the need for stored feed. Studies have also shown that grazing stockpiled tall fescue can reduce labor requirements up to 25% of that for conventional hay feeding. University of Kentucky researchers found stockpiled tall fescue produced 66 days of grazing per acre for dry, mature Angus beef cows and allowed the cows to gain 1.24 pounds per day. In the same study, hay requirements were only 564 pounds per cow during the period November 6 to February 10 (Table 7). Missouri data (Table 8) showed a reduction in wintering cost of $100.00 per cow.

Table 7. Performance of dry, pregnant cows* grazing stockpiled tall fescue (four-year average).

Grazing dates	11/6 to 2/10
Average daily gain	1.24 pounds
Stockpiling rate	1.33 cows per acre
Gain per cow	119 pounds
Hay fed per cow (11/6 to 2/10)	564

* Mature Angus cows bred to calve in March.
Source: Bradley, Neil, et al. 1984 Beef Cattle Research Report, University of Kentucky College of Agriculture Progress Report 282, pp. 11-12.

Table 8. Wintering cost per cow. Winter feeding period from Dec. 1 to Apr. 10.

Forage Source	Hay	Cornstalks	Stockpiled Tall Fescue	Ryegrass + Cereal Rye
$/cow/day	$1.32	$0.05	$0.31	$0.61
Days of use	130 hay	60 stalks	90 graze	90 graze
		70 hay	40 hay	40 hay
Wintering cost	$172	$122	$70	$108

Source: Gerrish, J. et al., University of Missouri.

In summary, stockpiling of adapted cool-season grasses such as tall fescue and bluegrass extends the grazing season, reduces winter hay feeding, provides a good return of high-quality forage for each pound of nitrogen fertilizer applied (providing other nutrients are not lacking and the nitrogen is applied early), and provides the beef cow herd an ideal place for wintering and calving.

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