NEWS TO EWES

Stockpiling Forages for Fall and Winter

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Introduction

Approximately 90% of the annual diet consumed by sheep around the world is made up of roughage, either as grass forage consumed in pastures, forage harvested as hay, or silage (haylage). Sheep producers whose forage base is a "cool season" grass, such as bluegrass, orchardgrass, fescue, timothy, and/or bromegrass, find these forages grow best in the spring and fall. As a result, they find annual **nutritional deficit** periods for sheep in summer and winter. Although the summer deficit can be averted by grazing leftover spring forage growth, legumes, or annuals (i.e., sorghum sudangrass, millet), supplemental feeding, usually in the form of hay, is required to cover the winter deficit. The cost of hay, whether homegrown or purchased, is one of the largest expenses in maintaining a sheep flock. For example, estimates of the combined costs of producing and harvesting average grass hay have been between $50 and $60 per ton, and some producers finish harvesting this hay just in time to start feeding it. Pasture management, such as stockpiling and subsequently grazing forages, can avoid some of the cost of harvesting the same forage for hay.

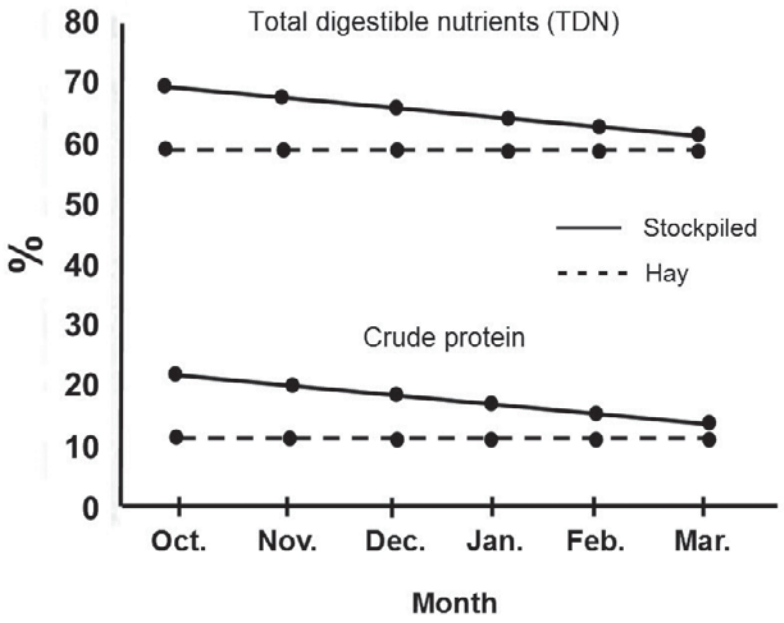
What Is Stockpiling?

Stockpiling forage is the practice of accumulating forage growth in pastures so it can be used for grazing in a later season. In Kentucky, and surrounding states, stockpiling takes advantage of late summer–early fall growing conditions to accumulate high quality cool season grass or grass-legume pastures for late fall and winter grazing. This grazing period (November/December) coincides with the beginning of the typical hay feeding season. The practice of stockpiling forage for late fall-winter grazing has not been as widely adopted in the sheep industry as the beef industry because the traditional lambing season has been in January/February in the Farm Flock States. This system typically required ewes be either totally or partially confined in barns in late gestation, lambing, and early lactation and be fed greater amounts of higher quality diets than may be available from stockpiled forages. However, with the advent of spring (April) lambing, there is a greater opportunity to allow ewes to graze stockpiled cool season forages during breeding in late November/early December and early gestation in late December and even into January. Instigation of some creativity today will even allow pregnant ewes to graze stockpiled forage before lambing begins in January/February. Out-of-season lambing (September/October) ewes can most certainly graze stockpiled forages after they wean lambs in December. This article will describe how stockpiled forages fit into each of these management programs.

Which Grasses Can I Stockpile for Sheep?

Garry Lacefield, Ray Smith, Jimmy Henning, John Johns, and Roy Burris, University of Kentucky extension specialists, described the best grass for stockpiling to be a "cool season" grass that will retain its green color and forage quality late into the winter. The grass should be resistant to low temperatures and have the capability of forming a tight sod. Tall fescue and Kentucky bluegrass contain these characteristics. Tall fescue is the classic cool season grass to stockpile. Typically, it makes more growth in the fall than bluegrass, orchardgrass, timothy, or bromegrass. It has a waxy layer on its leaves that makes it more resistant to frost damage and weathering. Therefore, grazing to a low winter residual height has little effect on subsequent spring growth or stand density. It also accumulates a high concentration of soluble carbohydrates (sugars) in the fall, so the resultant forage contains higher levels of total digestible nutrients (TDN = energy) and crude protein than typical tall fescue hay (Figure 1). Even though

Figure 1. Comparison of Stockpiled Tall Fescue Quality to Average Hay Quality*



***Source: Mark Kennedy, Missouri, 1997-2003 and John Jennings, Arkansas, 1998-2002.**

the quality of the stockpiled forage does decrease as winter progresses, tall fescue maintains its quality longer than other cool season grasses. If the tall fescue is endophyte-infected, the toxic ergovaline concentration has been shown to decrease dramatically from December to April. This rapid decline, in contrast to the slow decline of TDN and crude protein levels, makes tall fescue an excellent stockpiled forage for grazing from November through January and February.

Lambs are not especially fond of tall fescue because of its tall growth, large leaves, and high fiber content. Therefore, grazing stockpiled fescue should be reserved for mature ewes that are (1) in late gestation before lambing in January/February, (2) in the breeding pasture in late November/early December and early pregnancy in December, even into January, or (3) those that lambed in September/October and weaned their lambs in December.

Bluegrass can be stockpiled successfully because of the tight sod it makes. Its physical characteristics, especially its small, thin leaves, makes it highly palatable for sheep. Although it will contain higher protein levels than tall fescue, the total yield of forage per acre is only 50 to 60% of tall fescue. If bluegrass is stockpiled, plan to graze it earlier (November/December) than tall fescue because its quality decreases more rapidly after frosts and hard freezes. Orchardgrass and bromegrass can be stockpiled, but the quality of the forage decreases faster than fescue and bluegrass. These grasses also have less persistence under heavy winter grazing, which may cause stands to become thin for the next grazing season.

To maximize consumption of highest quality forage, graze all cool season grasses as soon as possible after hard freezes. Extended grazing into January fits stockpiled fescue best. But, many pastures may contain a mixture of cool season grasses (i.e., fescue/bluegrass, orchardgrass/bluegrass, fescue/orchardgrass or a combination of all three). These pastures should be managed the same way as pure stands. Graze as soon as possible after the stockpiling is complete and recognize that sheep will likely consume bluegrass first, orchardgrass second, and fescue last.

Tips for Stockpiling

Begin to prepare for stockpiling by deciding which field or fields to stockpile in spring and summer. Conduct a soil test for phosphorus, potassium, and calcium for potential phosphate, potash, and lime applications. Fields with deep soils are less prone to drought and are the best candidates for stockpiling. Forage growth responses to nitrogen fertilization rely heavily on soil moisture. Target pastures with thick stands of grass. Fields with excessive

News to Ewes continued from pg. 23
weed population are undesirable for stockpiling. Clovers are less responsive to stockpiling than are grasses.

Late July–early August is the time to actually begin stockpiling. Make sure the old, low-quality summer forage growth has been removed to 3 to 4 inches by grazing animals or mechanical clipping by August 1. Apply 50 pounds of actual nitrogen fertilizer per acre (150 lb ammonium nitrate) between August 1st and 15th. Phosphate, potash, and lime should be applied based on soil test recommendations. Nitrogen applications before August 1 may encourage the growth of crabgrass and foxtail and, subsequently, reduce the production of the grasses intended for stockpiling. Use ammonium nitrate fertilizer because urea is used only 79 to 89% as efficiently as the ammonium nitrate (Garry Lacefield, Ray Smith, Jimmy Henning, John Johns, and Roy Burris. Stockpiling for Fall and Winter Pasture. AGR-162, University of Kentucky).

Plans must be in place to provide alternative feed sources as the forage stockpiling progresses. Some of these plans will be dictated by the specific sheep production system. Then three production systems are identified as January/February, April, and September/October lambing. Producers whose lambing season is January/February manage their ewes through nutritional flushing and breeding during August/September. Typically, these ewes graze bluegrass, orchardgrass, bluegrass/white clover, or orchardgrass/white clover pastures until the end of breeding. These same ewes can serve as scavengers after breeding (early gestation) by grazing non-stockpiled grass pastures, corn or soybean residue after grain harvesting, turnips, or alfalfa (after a hard freeze) for 30 to 45 days (mid-October to mid-November, and into December). Stockpiling forage for late fall-early winter grazing may require the feeding of low quality hay during this scavenging period because the grazing feed source becomes exhausted. Having to feed hay during this time of the year may sound absurd, but the weather in October/November is more conducive to feeding hay than later in the cold of winter. In addition, less hay per ewe will be required to do the same job if fed in October/November rather than in December/January. After the scavenging or hay feeding period, move the ewes to stockpiled forage and graze this as long as possible before moving them to the barn for January/February lambing. As the ewes come within 4 weeks of lambing, they will need to be supplemented with 1.0 lb per head per day of shelled corn or concentrate mix whether they are grazing stockpiled forage or being fed medium quality hay in a non-stockpiled forage system.

A second sheep production system that can use stockpiled cool season forage is April lambing. In this system, ewes are dry and open during August/September/October when forage is typically stockpiled. The nutrient requirements for these ewes are low compared with their upcoming flushing/breeding, late gestation, and lactation requirements. Therefore, they make excellent scavengers to graze dormant cool season grasses or corn or soybean stubble until October 15. They make great use of turnips for 30 days (October 15 to November 15). If ewes are to lamb in April, their breeding season needs to be only 21 to 28 days (November 15th to December 7th to 15th). They can make use of stockpiled forage as they are supplemented with 1.0 lb shelled corn or concentrate mix per head per day during breeding. Continuing to graze this forage, without supplementation after breeding through late December and into January can save hay feeding during this period. Once all the stockpiled forage is consumed, low quality hay will likely have to be fed until March when ewes are switched to medium quality hay plus 1.0 lb per head per day of shelled corn or concentrate mix during the last 4 weeks of gestation.

Ewes bred out-of-season in May will lamb from September 25 through October 25 (fall lambing). They normally graze dormant cool season grass (orchardgrass or bluegrass/clover) pastures from August 1 to 25. They might continue to graze these same pastures in the last 4 weeks of gestation, but will need to be fed 1.0 lb shelled corn or concentrate mix per head per day. If lambing on pasture is a part of the production plan, the best time, weather-wise, is in September and October. If the ewes lamb on pasture, they most likely will remain on pasture during lactation. In this scenario, ewes will likely eat all the cool season fall grass, leaving hay feeding to be necessary all winter after lambs are weaned in December.

An alternative to this management plan is to lamb these ewes in the barn in September/October. Feed a lactation ration of 5 to 6 lb of hay and 2 to 3 lb of shelled corn or concentrate mix per head per day until lambs are weaned in December. This management allows the cool season grasses (tall fescue, orchardgrass, bluegrass, timothy, and/or bromegrass) to accumulate while lactating ewes are fed high quality hay in confinement. Then, after lambs are weaned in December, ewes can graze stockpiled forage as long as the supply lasts. Even if the stockpiled forage supply does not last all winter, the amount of hay required to maintain these dry ewes for the rest of winter will be less than if stockpiling was not a management practice.

Dollars and Cents

The most efficient way to use stockpiled forage is to strip graze. Place two strands of temporary electric fence across the field, as shown in Figure 2, to allow the flock access to a strip of pasture large enough for a one-, two-, or three-day grazing allotment. Strip grazing forces the animals to be less selective so the available forage is consumed more uniformly than if they had access to the entire field. Once an area is grazed to 3 to 4 inches, the fence is moved to include more of the pasture (Figure 2). A water supply that does not freeze and a loose complete mineral should always be available. A hay supply should be available for emergencies such as a 6-inch, or more, snow that covers the standing forage. Hay may also need to be fed if a thick layer of ice forms on the forage.

Tall fescue is the best forage to stockpile because of the reasons discussed above. Although it is less palatable to sheep than orchardgrass or bluegrass, stockpiling increases its quality and simultaneously increases its palatability. University of Kentucky research shows "new" novel varieties of tall fescue are more palatable than the "old" Kentucky 31 tall fescue. However, if stockpiled forage is grazed by mature ewes, palatability should not be a problem with any of the fescues.

Data from the University of Arkansas show stockpiling will supply as much as 2,000 lb forage dry matter (DM) per acre. The DM requirement of a 150-lb dry, open ewe to maintain weight is 2.6 lb per head per day. However, lower forage quality will increase the need for more daily DM intake. Pregnant ewes

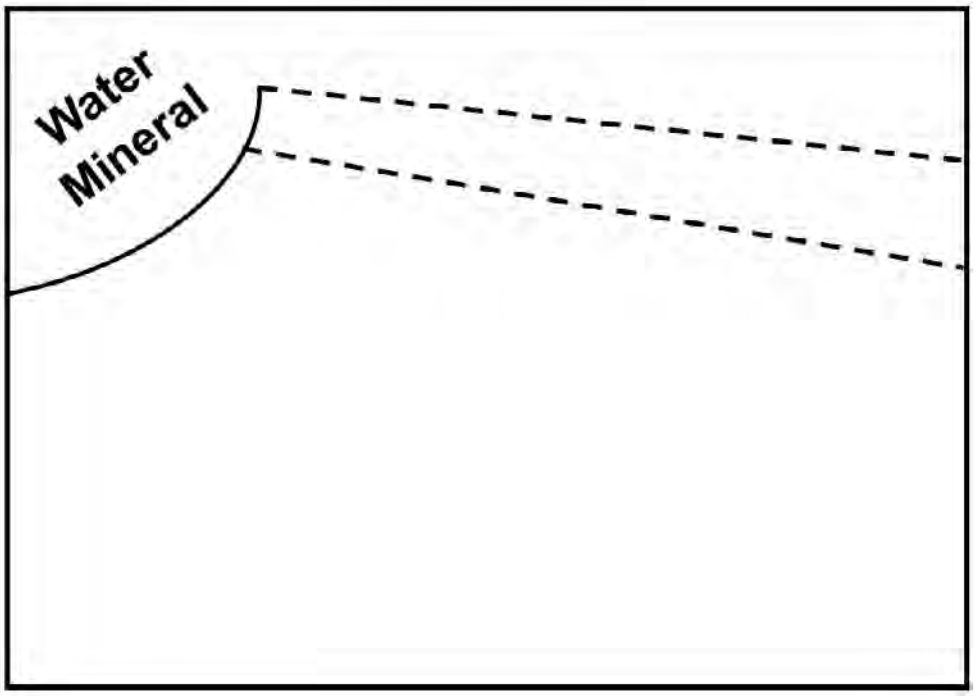


Figure 2. An Example of Strip Grazing Utilizing Temporary Electric Fence

scheduled to lamb in January/February need to gain 0.5 lb per head per day during late gestation, pregnant ewes scheduled to lamb in April need to gain 0.07 to 0.10 lb per head per day, and open ewes (September/October lambing) that have just weaned lambs need to gain 0.07 to 0.10 lb per head daily while grazing stockpiled forage. Therefore, let's say all of these ewes need to consume at least 3.0 lb DM per head per day. Then, an example of the economics of grazing stockpiled forage vs. feeding hay for a 50-ewe flock for 50 days becomes:

Grazing

50 ewes x 3.0 lb DM/ewe/d = 150 lb DM/50 ewes/d
150 lb DM/50 ewes/d x 50d = 7,500 lb DM/50 ewes/50d
Assume 75% utilization of standing forage DM (University of Arkansas data)
Therefore, 7,500 lb DM ÷ 75% utilization = 10,000 lb total DM/50 ewes/50d
10,000 lb total DM/50 ewes/50d ÷ 2,000 lb DM production/acre
Then, 50 ewes will require 5 acres for 50 grazing days
Fertilizer cost = $400/ton ÷ 2,000 lb/ton = 20¢/lb
Recommended 150 lb fertilizer/acre x 20¢/lb = $30/acre
$30/acre x 5 acres = $150/50 ewes/5 acres

Hay Feeding

Mature, fescue hay = $60/ton ÷ 2,000 lb/ton = 3¢/lb
* $4 lb hay/ewe/d x 3¢/lb = 12¢/ewe/d
50 ewes x 12¢/ewe/d = $6.00/50 ewes/d
$6.00/50 ewes/d x 50d = $300/50 ewes/50d

Grazing Savings

$300 - $150 = $150/50 ewes/50d
$150 ÷ 50 ewes = $3/ewe/50d
$3 x 5 ewes = $15/animal unit or $3 x 6 ewes = $18/animal unit

*Mature, fescue hay considered lower quality than stockpiled forage. Hay intake takes into account 10 to 15% wastage.

Research has shown a $15 to $20 savings per animal unit for grazing stockpiled forages vs. feeding hay. One animal unit is assumed to be one 1000 to 1200-lb beef cow or 5 to 6, 150-lb ewes. The $15 to $18 savings per animal unit in this example fits within the range reported from these research studies. In addition, grazing stockpiled forages can reduce labor requirements up to 25% of that for conventional hay feeding. Consequently, it seems that we should let the sheep do as much of the work as possible when harvesting forages.

Summary

Begin planning in spring and summer for stockpiled cool season grass grazing in late fall – early winter. Decide which field(s) and grass(es) to stockpile and which animals will consume the forage. Graze the forage to 3 to 4 inch height by August 1. Fertilize in early August and allow forage to accumulate until mid- to late-November or early-December. Provide alternate forage sources as the stockpiling progresses. Fescue produces the most stockpiled forage per acre (2,000 lb dry matter per acre), its quality (sugar content) increases through fall growth, and it maintains its quality longer into the winter (January/February) than other cool season grasses. Ewes scheduled to lamb in January/February can use stockpiled forage in late gestation if they are supplemented with at least 1.0 lb shelled corn or concentrate mix per head per day. If April is the month planned for lambing, ewes can be bred in late November/early December while grazing stockpiled forage. This grazing regimen can continue after breeding (late December into January). Lambs born in September/October are normally weaned in mid-December. Their mothers can be managed, after weaning, on stockpiled forage as long as the forage supply lasts during winter. Use of electric fence and strip grazing leads to the most efficient use of the standing forage in all situations. Moving the fence every day, every two days, or every three days forces the animals to be nonselective of the forage plants they consume, which promotes uniform grazing. Grazing stockpiled cool season grasses is more economically efficient than feeding hay during the same time frame (November/December/January) and can save as much as 25% in labor because the sheep do the work of harvesting.

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