



United States Department of Agriculture

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Natural Resources Conservation Service

Technical Note No: TX-PM-14-03

July 2014

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**Evaluation of Grazing Management and Winter Stockpiling of Warm Season Grasses in North-Central Texas and Southwestern Oklahoma**

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**Plant Materials Technical Note**

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**Background:**

Accumulation of forage at one time of the year for grazing at a later time, or stockpiling, is a grazing management practice commonly used in cattle production (Lemus, 2008). Stockpiling of warm-season perennial grasses for grazing after frost could potentially reduce input cost in Texas by decreasing winter feeding cost. In Texas, the annual production costs per cow can range from \$325 to \$522. A rancher can estimate 35-47% of these costs are incurred with grazing and winter feeding (Evers, Redmon and Provin, 2004). While limited work has been done with perennial grasses such as bermudagrass, little has been done with native or plants commonly managed as

primarily native grasses. Grasses such as: 'Alamo' Switchgrass (*Panicum virgatum*), 'Lometa' Indiangrass (*Sorghastrum nutans*), 'Selection 75' kleingrass (*Panicum coloratum*), 'San Marcos' eastern gamagrass (*Tripsacum dactyloides*), OK select germplasm little bluestem (*Schizachyrium scoparium*), and 'WW-B. Dahl' old world bluestem (*Bothriochloa bladhii*) are other common perennial grasses that could be used as a standing hay crop. After freezing temperatures kill the top growth of these grasses, they can be grazed with little effect on the plant health the following year. Winter pastures are usually lower in nutritional value, so additional supplements may need to be added to livestock diets (Mitchell and Anderson, 2008). WW-B Dahl will have a crude protein concentration of 9-12% during the active growing season (May-July), but will drop to 3.5-4% during December to January (Allen and Brown, 2011).

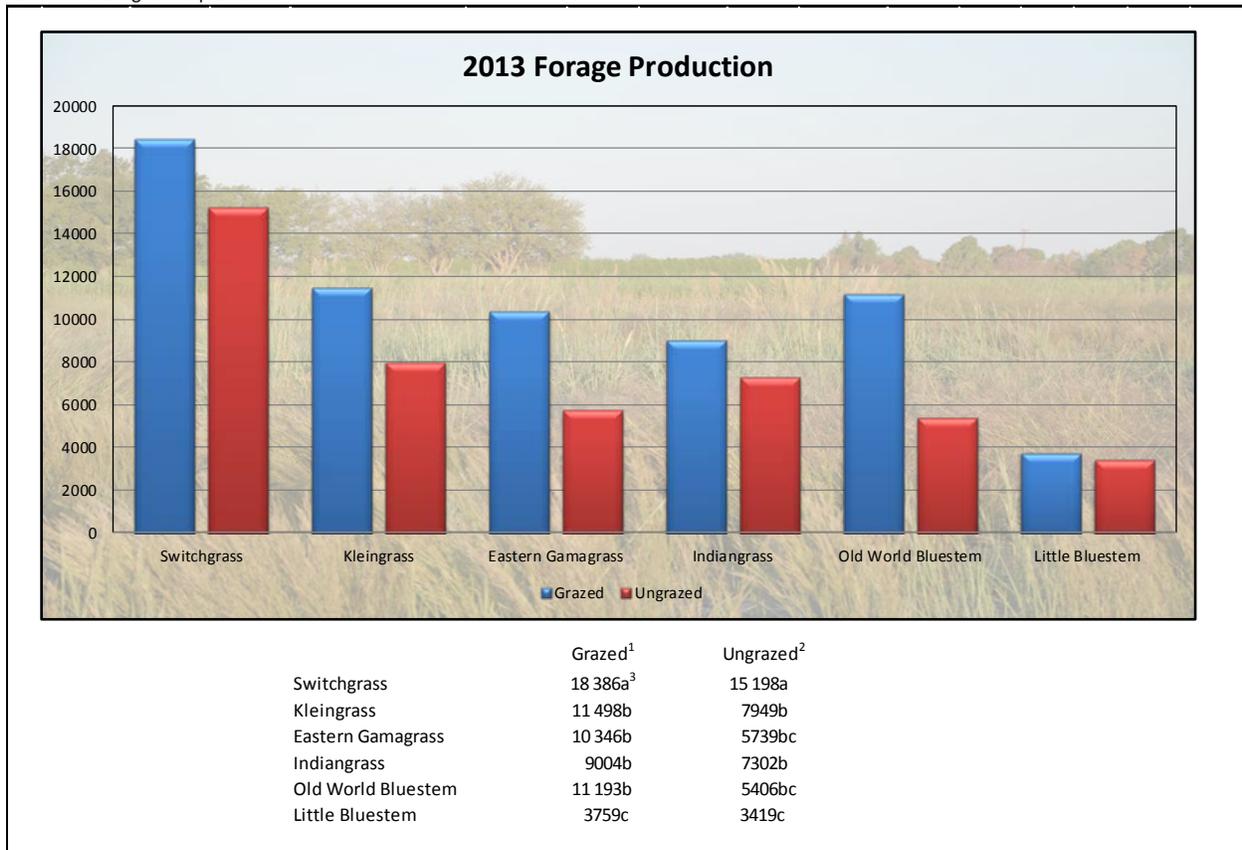
### **Purpose:**

The purpose of this technical note is to provide general information on warm season grass forage quality and quantity as it relates to the timing of harvest. Rangeland plantings are designed with the intent to provide grazing in both the growing and dormant seasons. Forage quality of adapted grasses has been extensively studied, but little work has been done during the dormant season. This tech note compares the forage quantity and quality of warm season grasses to assist producers with management decisions on supplementation needed to meet dietary requirements for cattle production.

### **Results:**

The first year of data collection and analysis showed statistical differences in forage quality and quantity between management practices throughout the dormant season. Figure 1 shows the difference between the two management practices during the growing season. The grazed plots were clipped on the 1<sup>st</sup> of July to simulate grazing a pasture. The amount of forage was calculated and added with the amount of regrowth calculated at the end of the growing season. The ungrazed plots were not clipped until the end of the growing season and represent the amount of forage produced from green up in the spring until dormancy in the fall. Most of the six grasses responded well to the mid-season clipping. The old world bluestem, kleingrass, and eastern gamagrass produced almost twice as much biomass when they were clipped compared to leaving them all season. Pastures of these grasses have the capability to be grazed and still produce a substantial standing hay crop.

**Figure 1.** Forage production potential (lb/ac) of six perennial, warm-season grasses collected at the end of the growing season season under different management practices.



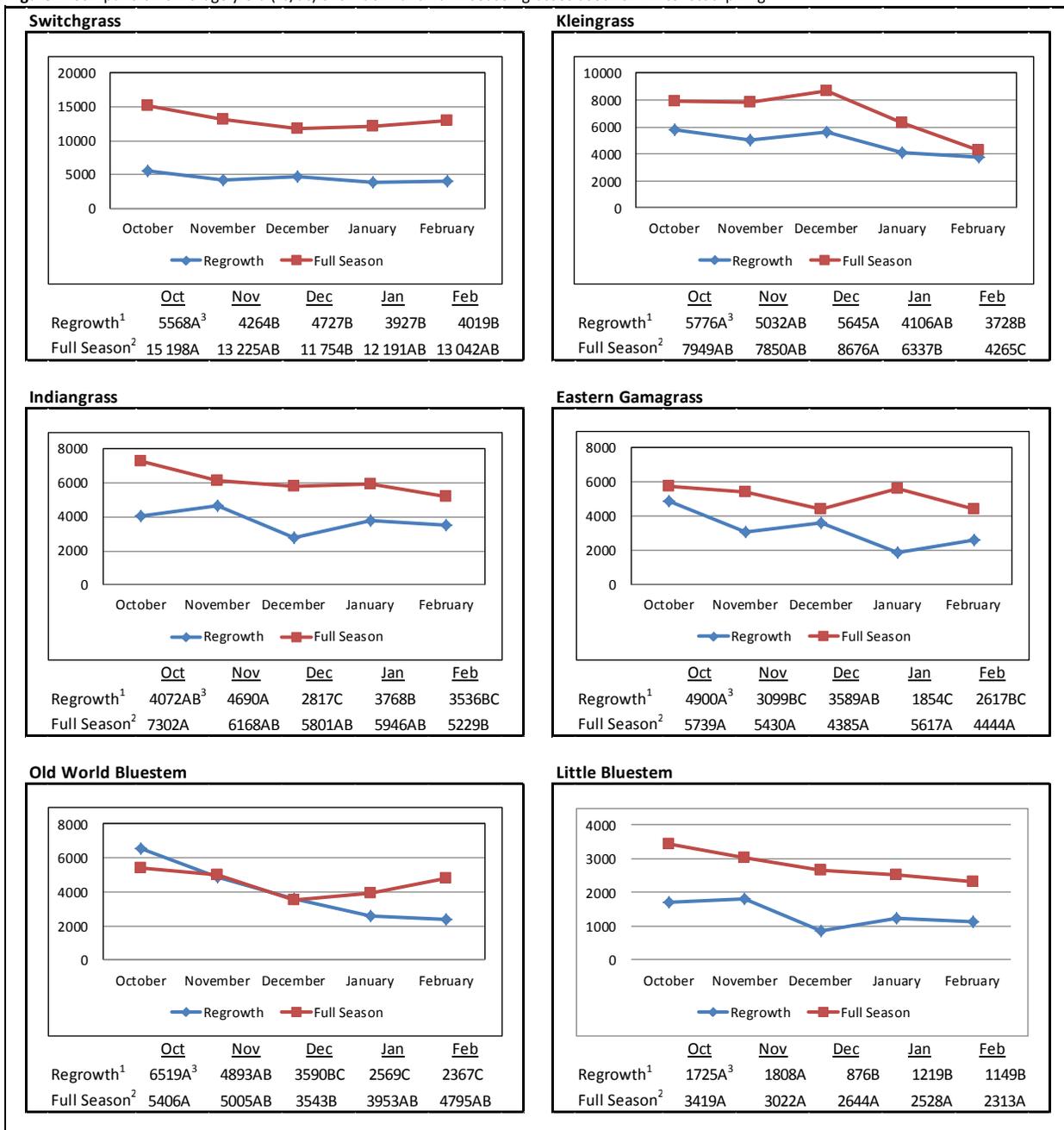
<sup>1</sup>Grazed is biomass produced from spring greenup to July 1st combined with biomass produced from July 1st to killing frost.

<sup>2</sup>Ungrazed is biomass produced from greenup in the spring to killing frost.

<sup>3</sup>Values within columns followed by different lower-case letters differ between species (P<0.05).

Figure 2 shows the forage yield comparison for each specie throughout the winter months. The yield in most cases will decrease the longer the forage is subjected to weathering. The switchgrass that was allowed to grow all season long produced the most biomass throughout the winter with values remaining above 10,000 lb/ac.

Figure 2. Comparison of forage yield (lb/ac) of six dormant warm season grasses used for winter stockpiling



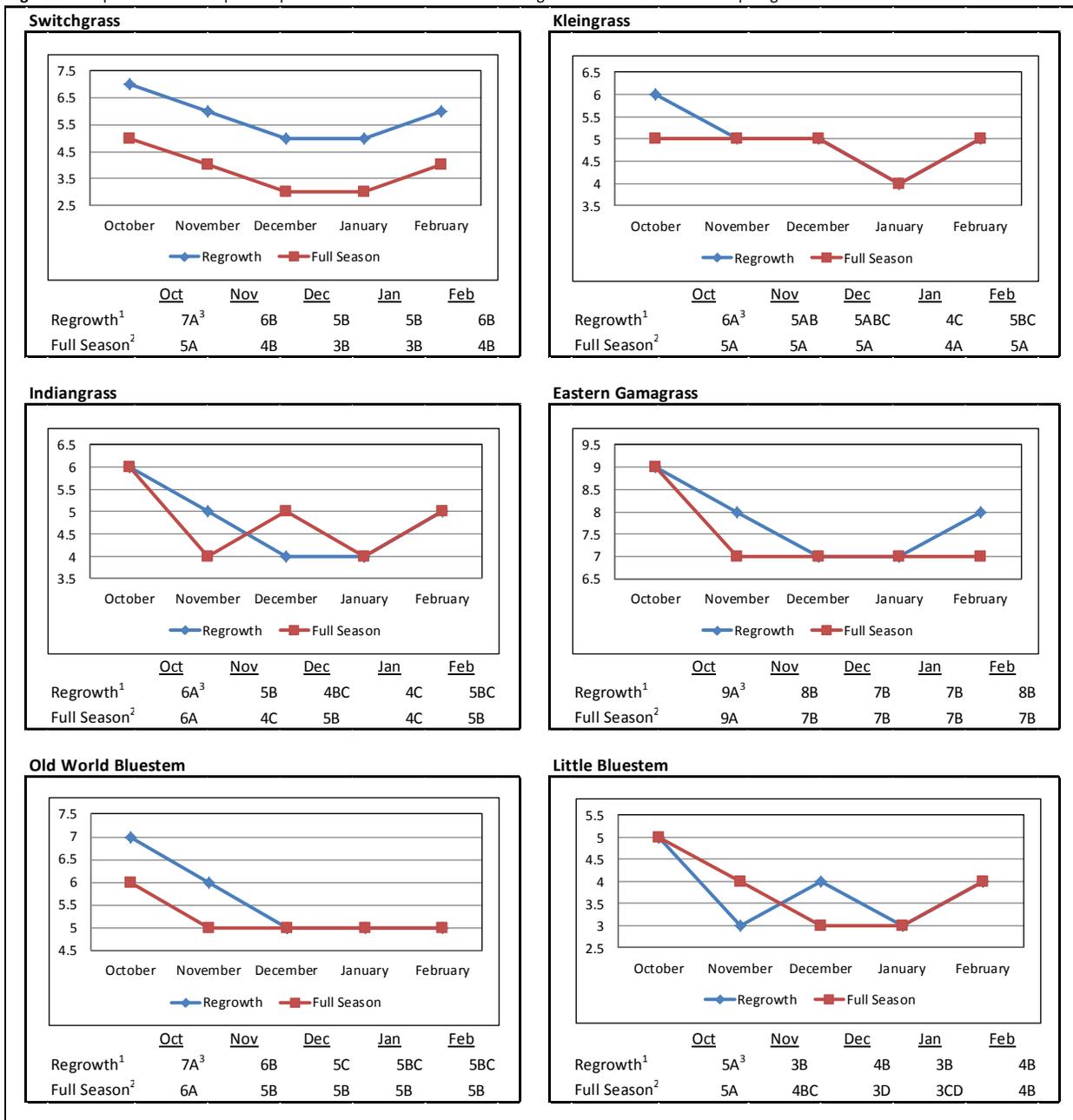
<sup>1</sup>Regrowth is biomass produced from July 1st to killing frost

<sup>2</sup>Full season is biomass produced from greenup in the spring to killing frost

<sup>3</sup>Values within rows followed by different upper-case letters differ between date (P<0.05)

Figure 3 shows the change in percent crude protein from October to February. As the winter progressed, all the grasses began to see a decrease in the percent crude protein with the exception of kleingrass. It remained between 4-6% until February. Eastern gamagrass had the highest crude protein percent ranging from 7-9%. Although there is a slight increase in February, in most cases, it is insignificant and could be attributed to spring greenup.

Figure 3. Comparison of crude protein percent of six dormant warm season grasses used for winter stockpiling



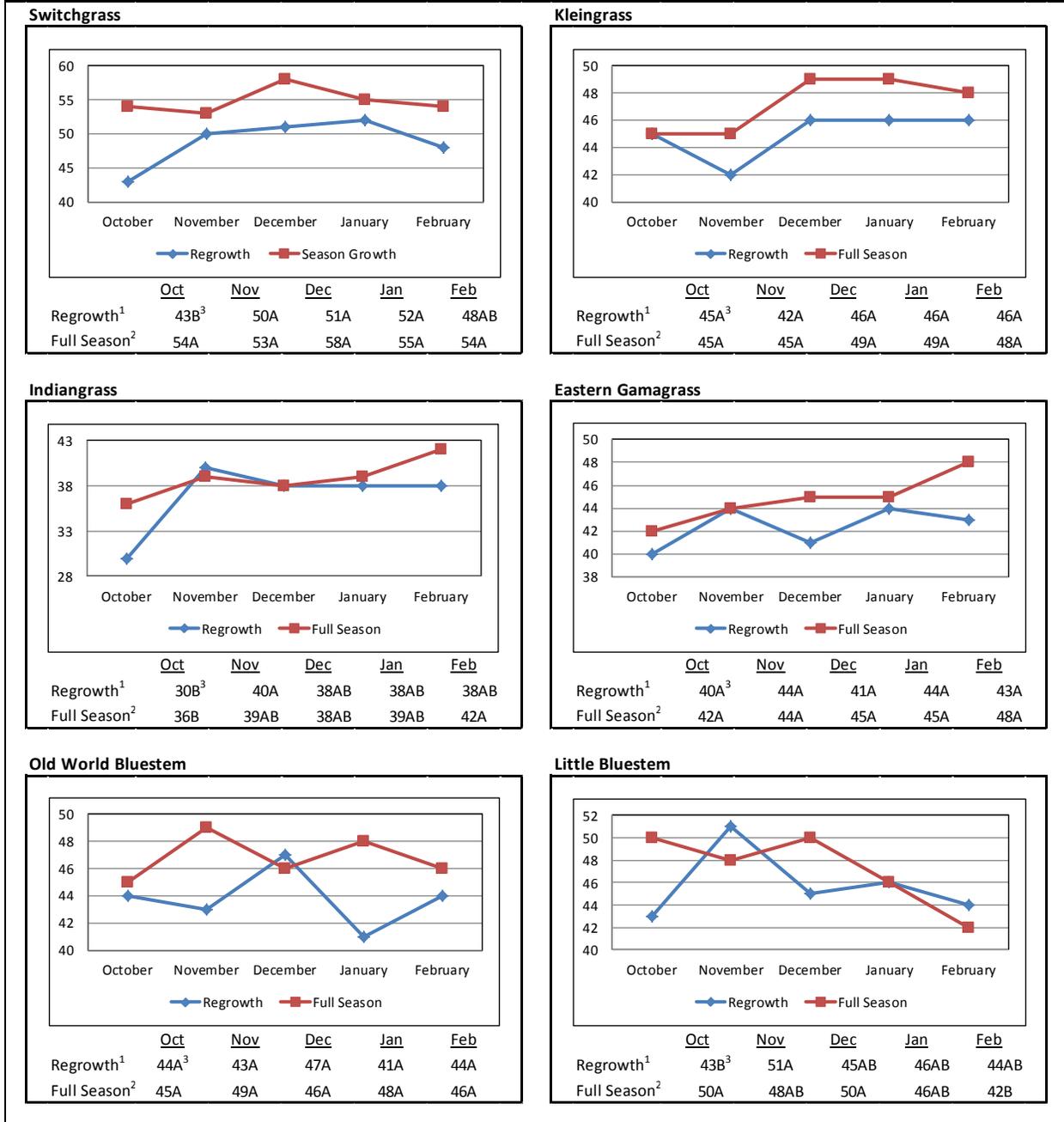
<sup>1</sup>Regrowth is biomass produced from July 1st to killing frost

<sup>2</sup>Full season is biomass produced from greenup in the spring to killing frost

<sup>3</sup>Values within rows followed by different upper-case letters differ between date ( $P \leq 0.05$ )

Figure 4 presents the percent in-vitro dry matter disappearance (%IVDM). Although there were differences between species during the months, switchgrass appeared to be the only grass where %IVDM was affected throughout the winter months.

Figure 4. Comparison of percent in-vitro dry matter disappearance (%IVDM) of six dormant warm season grasses used for winter stockpiling



<sup>1</sup>Regrowth is biomass produced from July 1st to killing frost

<sup>2</sup>Full season is biomass produced from greenup in the spring to killing frost

<sup>3</sup>Values within rows followed by different upper-case letters differ between date (P<0.05)

**Summary:**

Range and pasture plantings should be managed in a manner to provide grazing in the growing season as well as the dormant season. These grasses responded positively to grazing for part of the growing season. Old world bluestem and eastern gamagrass doubled or greatly increased the total forage potential by grazing them. Other grasses like Indiangrass and little bluestem showed very little benefit in forage quantity whether they were grazed or not. Range and pasture plantings should be grazed for part of the growing season in order to reap the benefit of the maximum production potential of the forage. Standing hay crops also tend to decline in available pounds further into the winter months. One main reason for this decline is the effect weather such as wind, rain, and snow, has on the pasture. The quality of the forage also changes throughout the dormant season. In these species, the crude protein decreased from October to November in both the grazed and ungrazed scenarios due to the drying down of the forage. The stem to leaf ratio will be lower in pastures that are not grazed compared to the grazed pastures. While the digestibility did change, it was insignificant. While these grasses will provide ample dry matter for cattle, nutrient supplementation may still be necessary depending on specific producer objectives.

## **Bibliography**

Allen, V.G., and P. Brown. "'WW-B.Dahl' Old World Bluestem." Forage/Livestock Systems Research Unit Department of Plant and Soil Science Texas Tech University, 2011.

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