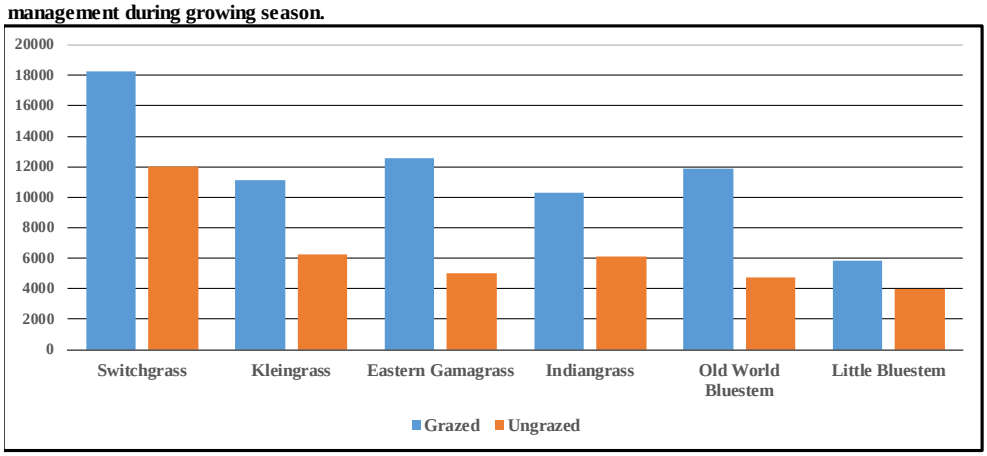
United States Department of Agriculture

Evaluation of Grazing Management and Winter Stockpiling of Warm Season Grasses

Forage quality of adapted grasses has been extensively studied, but little work has been done to evaluate dormant season forage quality. This study, with collaboration from the Texas Grazing Land Coalition (GLC) and Texas A&M *AgriLife* Research and Extension at Stephenville, compared the forage quantity and quality of warm season grasses to assist livestock producers with management decisions to meet dietary requirements for livestock production.

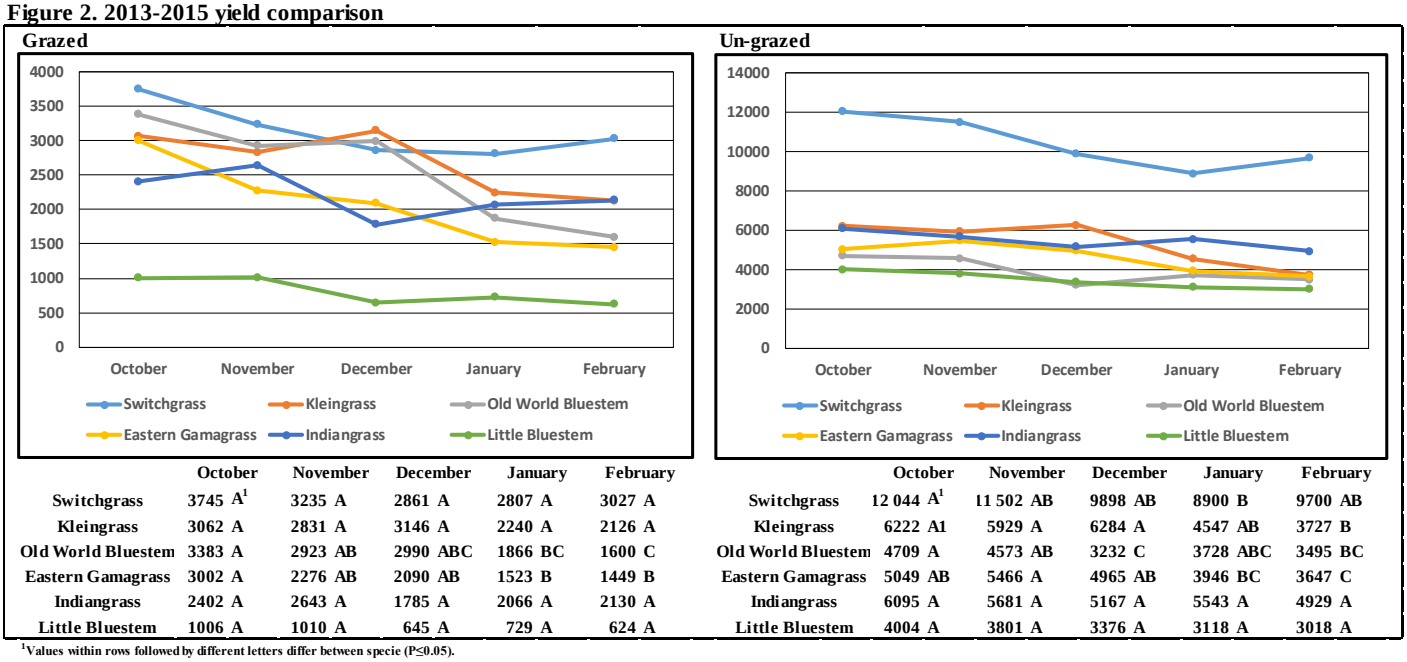
Results from this study indicate that range and pasture plantings should be grazed for part of the growing season in order to reap the benefit of the maximum production potential of the forage. Figure 1 shows that the total yearly biomass was higher under each management scenario when grazed during the spring and early summer compared to season long growth. It is an important management decision to allow sufficient time for a pasture to recover from early season grazing if winter stockpiling is a goal.

Figure 1. 2013-2015 forage produciton (lbs/ac) comparision between grazed and un-grazed management during growing season.



This study also compared the effects of time and weather on the forage quality and quantity throughout the dormant season under each grazing scenario. Figure 2 shows the differences in total forage available for consumption throughout the winter months. Switchgrass, kleingrass, Indiangrass, and little bluestem lost no production in the grazing scenario while the eastern gamagrass and old world bluestem decreased significantly in forage quantity. In the un-grazed treatment, all species lost significant yield with the exception of Indiangrass and little bluestem.

Figure 2. 2013-2015 yield comparison



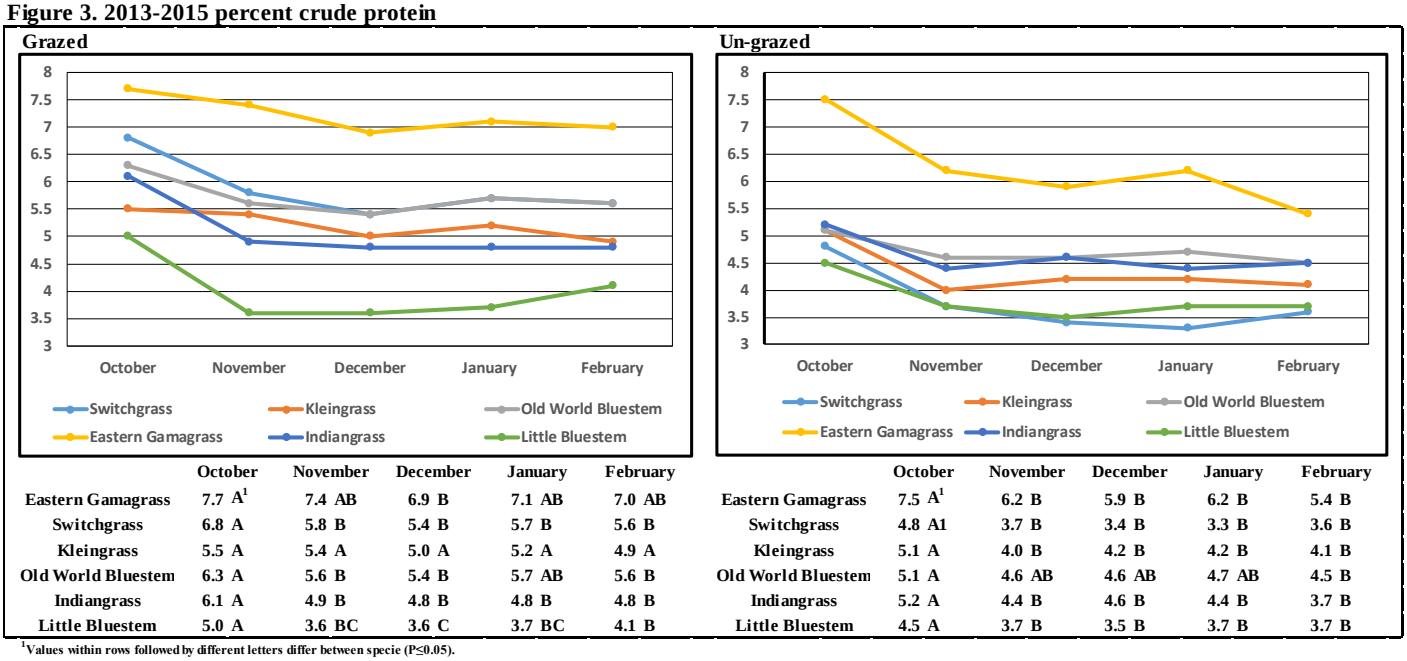
Grazed	October	November	December	January	February
Switchgrass	3745 A[1]	3235 A	2861 A	2807 A	3027 A
Kleingrass	3062 A	2831 A	3146 A	2240 A	2126 A
Old World Bluestem	3383 A	2923 AB	2990 ABC	1866 BC	1600 C
Eastern Gamagrass	3002 A	2276 AB	2090 AB	1523 B	1449 B
Indiangrass	2402 A	2643 A	1785 A	2066 A	2130 A
Little Bluestem	1006 A	1010 A	645 A	729 A	624 A

Un-grazed	October	November	December	January	February
Switchgrass	12 044 A[1]	11 502 AB	9898 AB	8900 B	9700 AB
Kleingrass	6222 A1	5929 A	6284 A	4547 AB	3727 B
Old World Bluestem	4709 A	4573 AB	3232 C	3728 ABC	3495 BC
Eastern Gamagrass	5049 AB	5466 A	4965 AB	3946 BC	3647 C
Indiangrass	6095 A	5681 A	5167 A	5543 A	4929 A
Little Bluestem	4004 A	3801 A	3376 A	3118 A	3018 A

[1]Values within rows followed by different letters differ between specie (P≤0.05).

In figure 3, under both management scenarios, the crude protein significantly changed between October and November for all the grasses with the exception of the grazed kleingrass. This is attributed to the first freeze occurring around the middle of November. From then on, there was no statistical difference in the crude protein percent. Eastern gamagrass showed the highest percent crude protein, however, in most classes of livestock production, supplementation will still be necessary.

Figure 3. 2013-2015 percent crude protein



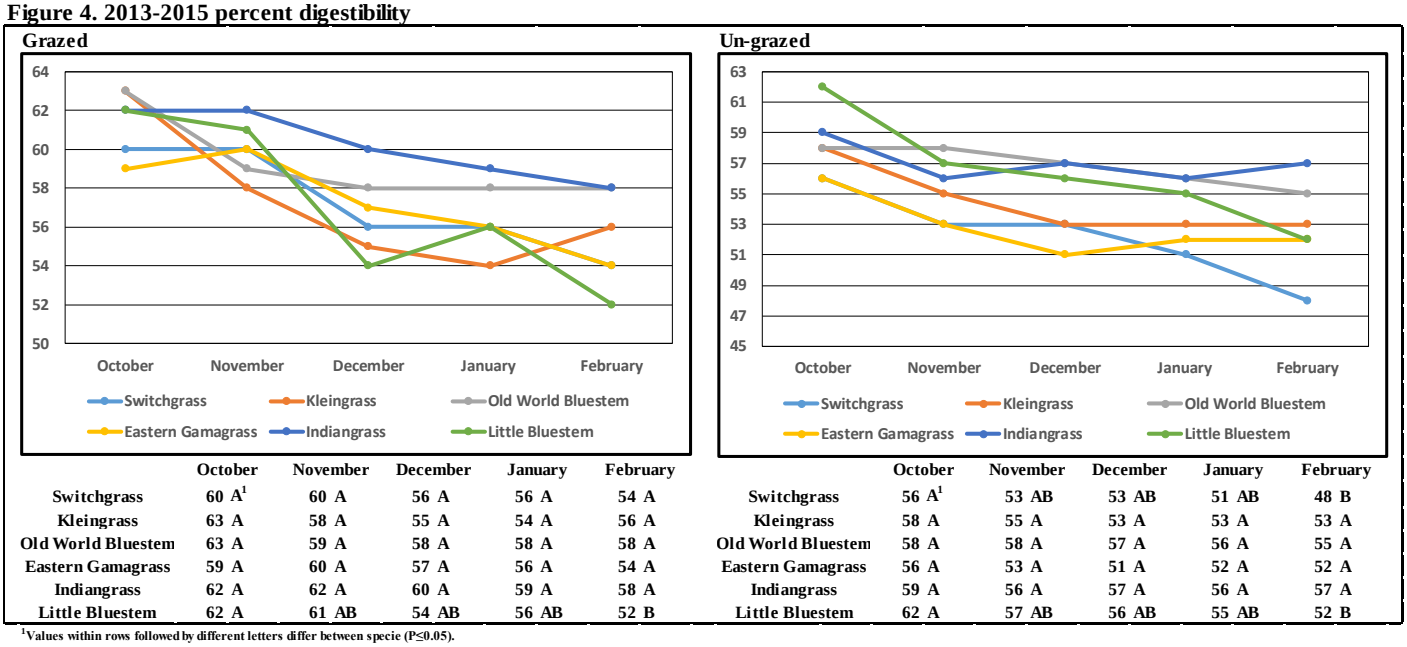
Grazed	October	November	December	January	February
Eastern Gamagrass	7.7 A[1]	7.4 AB	6.9 B	7.1 AB	7.0 AB
Switchgrass	6.8 A	5.8 B	5.4 B	5.7 B	5.6 B
Kleingrass	5.5 A	5.4 A	5.0 A	5.2 A	4.9 A
Old World Bluestem	6.3 A	5.6 B	5.4 B	5.7 AB	5.6 B
Indiangrass	6.1 A	4.9 B	4.8 B	4.8 B	4.8 B
Little Bluestem	5.0 A	3.6 BC	3.6 C	3.7 BC	4.1 B

Un-grazed	October	November	December	January	February
Eastern Gamagrass	7.5 A[1]	6.2 B	5.9 B	6.2 B	5.4 B
Switchgrass	4.8 A1	3.7 B	3.4 B	3.3 B	3.6 B
Kleingrass	5.1 A	4.0 B	4.2 B	4.2 B	4.1 B
Old World Bluestem	5.1 A	4.6 AB	4.6 AB	4.7 AB	4.5 B
Indiangrass	5.2 A	4.4 B	4.6 B	4.4 B	3.7 B
Little Bluestem	4.5 A	3.7 B	3.5 B	3.7 B	3.7 B

[1]Values within rows followed by different letters differ between specie (P≤0.05).

The digestibility (figure 4) of little bluestem and switchgrass differed significantly while the other grasses remained constant throughout the dormant season. Under both management scenarios, digestibility met the minimum requirements for many classes of livestock throughout the dormant season.

Figure 4. 2013-2015 percent digestibility



	October	November	December	January	February
Switchgrass	60 A[1]	60 A	56 A	56 A	54 A
Kleingrass	63 A	58 A	55 A	54 A	56 A
Old World Bluestem	63 A	59 A	58 A	58 A	58 A
Eastern Gamagrass	59 A	60 A	57 A	56 A	54 A
Indiangrass	62 A	62 A	60 A	59 A	58 A
Little Bluestem	62 A	61 AB	54 AB	56 AB	52 B

	October	November	December	January	February
Switchgrass	56 A[1]	53 AB	53 AB	51 AB	48 B
Kleingrass	58 A	55 A	53 A	53 A	53 A
Old World Bluestem	58 A	58 A	57 A	56 A	55 A
Eastern Gamagrass	56 A	53 A	51 A	52 A	52 A
Indiangrass	59 A	56 A	57 A	56 A	57 A
Little Bluestem	62 A	57 AB	56 AB	55 AB	52 B

[1]Values within rows followed by different letters differ between specie (P≤0.05).

Threeflower Melicgrass, *Melica nitens*, Plant Evaluation

The plant evaluation trail for threeflower melicgrass, *Melica nitens*, is advancing into a seed increase nursery. Forty-two collections were originally received from field offices across Texas and have been evaluated since 2012. The following list contains the collections that best represent the characteristics associated with this specie. Advanced testing, off-center plantings, and seed increase will continue until a germplasm release is available for commercial production.

Threeflower Melicgrass Plant Collections Advancing to Increase Nursery

Accn. No	County	Collected By	Survival[/1]	Vigor[/2]	Height[/3]	Uniformity[/4]	Maturity[/5]	Lodging[/6]	Plant Width[/7]	Seed Production[/8]	Germination[/9]
9093017	Sutton	Kason Haby & Ty Williams	93%	3	31	2	Mid	2	6	5	15%
9107796	Mason	Bryan Lange	100%	3	29	2	Late	2	10	3	5%
9107797	Crockett	Ty Williams & Tyler Hinrichs	93%	3	25	4	Late	3	8	4	10%
9107799	Bosque	Kent Ferguson	47%	3	28	4	Mid	1	9	6	68%
9107801	Runnels	Randy Linex & Ronnie Vanicek	100%	3	29	3	Late	2	9	4	10%
9107862	Palo Pinto	Austin Shero & Ricky Linex	50%	3	30	3	Mid	2	9	4	34%

1/ Percent of plants survived taken at stem elongation

2/ Rating of overall vigor of plants within population (1=vigorous, 5=not vigorous)

3/ Maximum plant height in inches taken at seed maturity

4/ Uniformity is visual rating of plant similarities within population (1=uniform, 5=not uniform)

5/ Maturity ratings (Early:late March-early April---Mid:mid to late April---Late-early to mid May)

6/ Rating of lodging observed at seed maturity (1=upright, 3=lodge to an angle greater than 45° from vertical, 5=horizontal touching soil surface)

7/ Plant width is measurement in inches of plant from outside edges

8/ Seed production is visual for potential yield on a scale of 1-10 (1=high producer, 10=low producer) Taken at seed maturity

9/ Germination on hand picked seed expressed as a percent

Program Emphasis

The mission of the James E. “Bud” Smith PMC is to develop and transfer effective state-of-the-art plant science technology to meet customer and resource needs. The PMC conducts plantings and studies at the Center and off center with cooperating partners. Plant and technology development objectives of the PMC include:

- Soil Health
- Erosion Control - wind and water
- Range and Pasture Improvement
- Wildlife Habitat Improvement
- Water Quality Improvement on Agricultural Land
- Biofuels
- Saline Site Restoration

James E. “Bud” Smith Plant Materials Center

The United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) James E. “Bud” Smith Plant Materials Center (PMC) located near Knox City, Texas, was establish in 1965. It is one of the 27 Centers located throughout the United States. The Center is responsible for developing conservation plants and cultural techniques for use within targeted Major Land Resource Areas (MLRA) in Texas, Oklahoma, Kansas, Colorado, and New Mexico. The Center is also responsible for producing Breeder and Foundation seed of plant releases and assisting in commercial development and promoting their use in natural resource conservation. The PMC serves all or portions of 136 counties in Texas that comprises parts of 25 MLRAs, and the areas served in all or portions of 39 counties in southwestern Oklahoma comprising parts of thirteen MLRAs. The PMC also serves a portion of seven counties in southwestern Kansas including parts of four MLRAs, a portion of one county in the southeastern corner of Colorado comprising parts of three MLRAs, and a portion of seven counties in eastern New Mexico comprising parts of seven MLRAs. The PMC is located approximately four and a half miles northwest of Knox City, Texas, in the Rolling Red Plains MLRA.

James E. “Bud” Smith PMC Personnel

- Brandon Carr- Manager
- Randy Kuehler- Biological Science Technician (Plants)

Visit the PMC website for more information and publications:
http://www.nrcs.usda.gov/wps/portal/nrcs/main/plantmaterials/pmc/central/txpmc/