

Forage Production, Nutritive Quality and Growth Pattern of Various Warm Season Grasses

Plant Materials Technical Note



Background:

Nutritive quality of different grasses is important to livestock producers when making pasture and grazing management decisions. There is very limited information available on forage and nutritive quality distribution of various warm season perennial grass cultivars. This information is needed to support and/or strengthen NRCS' efforts in:

- FSGD- Forage Suitability Group Descriptions
- NASIS- National Soil Information System
- NRCS Conservation Practice standards such as Prescribed Grazing, Pasture and Hay Planting and Range Seeding
- Web Soil Survey
- Grazingland Spatial Analyses Tool- GSAT
- Nutritional Balance Analyzer- NUTBAL



Purpose:

The purpose of this technical note is to provide initial data results from a replicated study conducted at the James E. “Bud” Smith Plant Materials Center near Knox City, TX. The PMC is evaluating monthly nutritive quality distribution of various warm season perennial grass cultivars under low and high fertility management. This data will assist livestock producers and NRCS Field Office conservationist in determining optimum forage harvest times relative to livestock nutritional needs.

Results:

The following information depicts the monthly percent crude protein (CP), percent In-Vitro Dry Matter (IVDMD) and biomass per acre collected from 2007-2009. Results indicate that nitrogen fertilization has no statistical influence on plant productivity and forage quality.



2007-2009 Forage and Yield Averages

San Marcos Eastern Gamagrass			
	% Crude	%	Yield
	Protein	IVDMD	lbs/ac
Apr	18.10	70.2	1693.9
May	14.43	62.2	5200.1
Jun	11.17	57.4	10216.4
Jul	10.10	53.7	8986.7
Aug	10.60	52.1	12768.9
Sep	11.27	56.8	13292.7
Oct	10.57	54.8	12144.0
Nov	8.07	51.6	11820.1

Alamo Switchgrass			
	% Crude	%	Yield
	Protein	IVDMD	lbs/ac
Apr	15.23	68.2	1625.6
May	12.17	58.5	5602.4
Jun	9.80	57.8	7519.5
Jul	7.80	54.3	12467.2
Aug	7.10	49.3	12078.0
Sep	6.57	49.0	22166.9
Oct	5.83	46.7	21348.5
Nov	5.63	43.8	18063.3

Selection 75 Kleingrass			
	% Crude	%	Yield
	Protein	IVDMD	lbs/ac
Apr	17.00	69.3	1507.5
May	14.33	64.7	4446.0
Jun	11.87	60.4	7607.9
Jul	10.30	58.1	6339.4
Aug	9.50	54.0	8523.5
Sep	9.53	56.9	12478.6
Oct	8.43	52.8	12988.1
Nov	6.87	52.7	13530.4

Lometa Indiangrass			
	% Crude	%	Yield
	Protein	IVDMD	lbs/ac
Apr	13.27	73.0	1044.4
May	10.80	65.1	3075.6
Jun	9.13	62.3	4105.6
Jul	8.10	59.0	3253.5
Aug	7.40	52.0	5754.4
Sep	7.67	56.3	7877.7
Oct	7.20	54.0	7998.7
Nov	5.73	53.2	8593.1

Earl Big Bluestem			
	% Crude	%	Yield
	Protein	IVDMD	lbs/ac
Apr	14.23	74.2	1238.8
May	11.10	66.3	2172.8
Jun	9.80	64.0	2041.0
Jul	8.63	59.4	2135.6
Aug	8.50	54.4	2382.9
Sep	8.40	52.1	4379.7
Oct	6.77	52.3	5743.3
Nov	5.73	50.7	4816.9

Haskell Sideoats Grama			
	% Crude	%	Yield
	Protein	IVDMD	lbs/ac
Apr	12.70	69.7	1002.0
May	10.40	62.7	1680.5
Jun	9.23	59.0	2247.4
Jul	8.20	55.3	2512.1
Aug	7.60	50.0	3180.7
Sep	8.03	50.0	5888.6
Oct	6.90	48.7	5274.9
Nov	6.20	47.2	4261.6

Summary:

The statistical data represented in this technical note was collected at the James E. "Bud" Smith Plant Materials Center near Knox City, TX. This data represents three years of analysis with no other special replication other than that within the research plot at the PMC. This information is to be used in general comparisons between species and sites and may not reflect actual results at all locations in Texas.

Crude protein and digestibility of the grasses evaluated decreased monthly as the phenological growth stage of the grasses changed from vegetative to seed maturity. Forage quality estimates were highest in April-July (vegetative and boot stage) and declined as the grasses reached reproductive stage. Biomass accumulation for most of the grasses occurred early (May-June) with the highest accumulation in August and September as a result of late summer and early fall precipitation. Under proper utilization and management, the warm season grass cultivars investigated in this study can provide the nutritional needs of various beef cattle classes as illustrated in the National Research Council Crude Protein and Digestibility Needs table below.

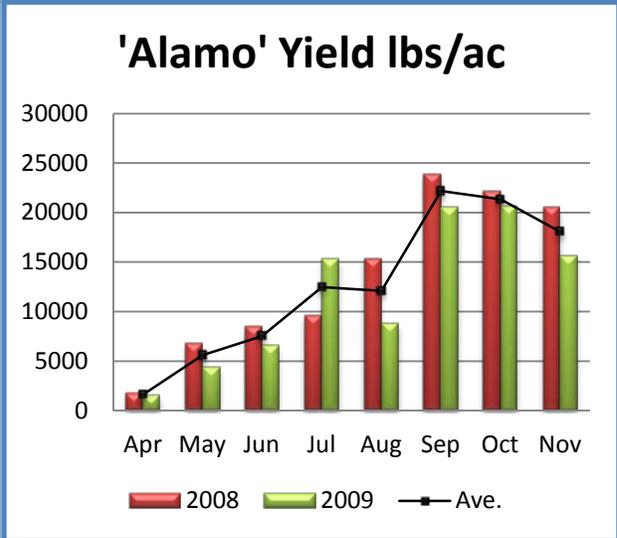
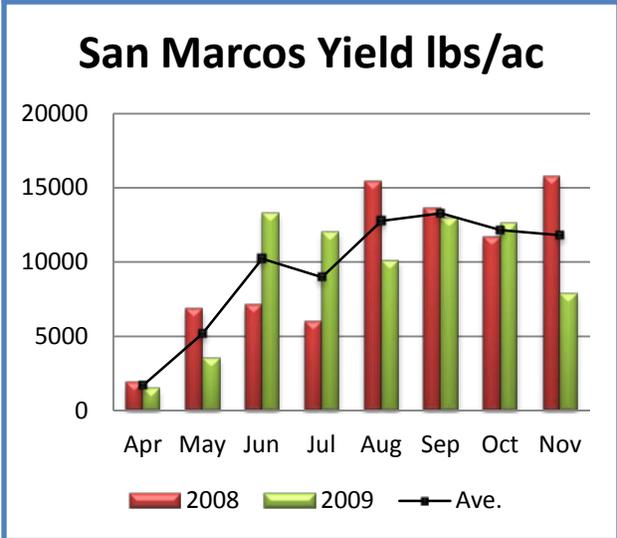
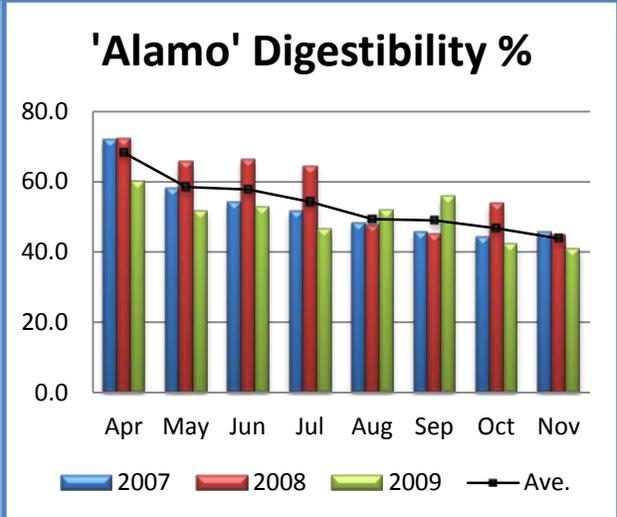
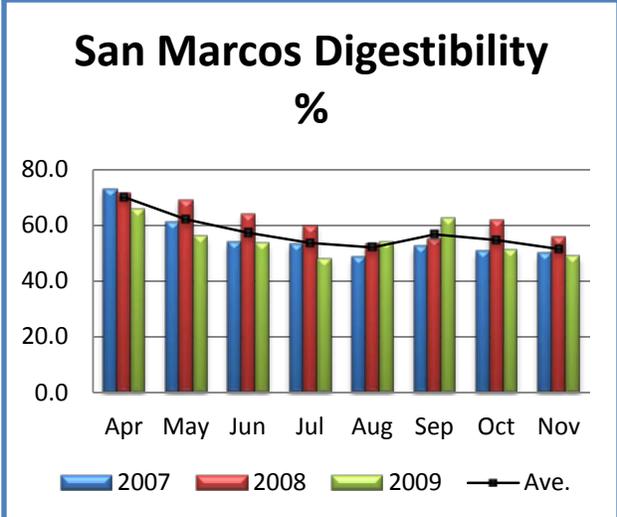
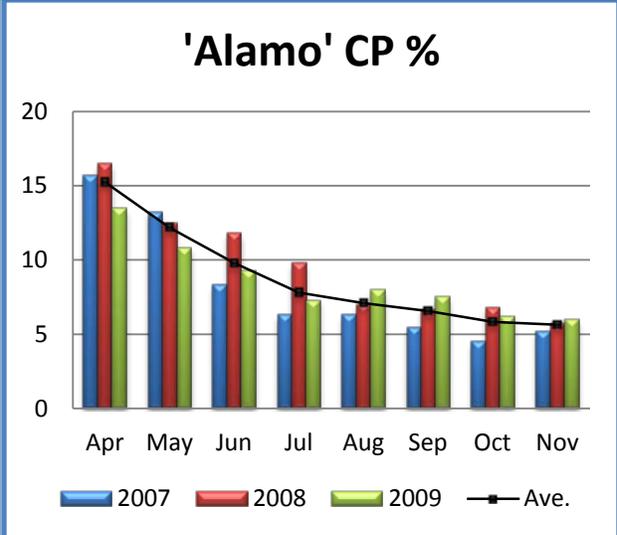
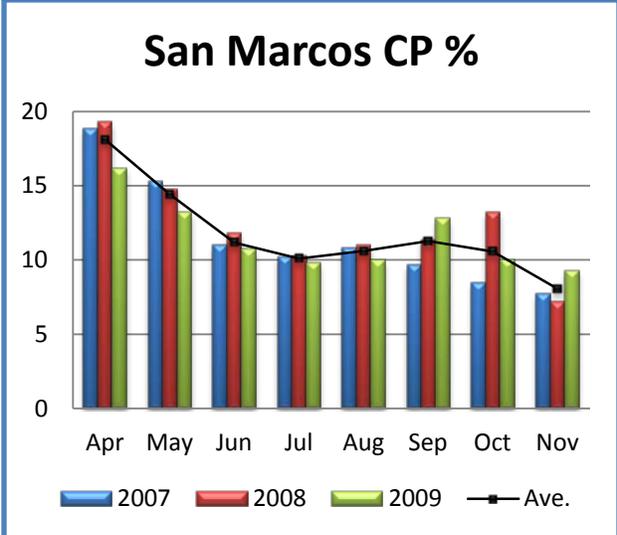
The chart below represents the nutritional needs for various classes of beef cattle. (CP represents crude protein which is the total protein content demand and DOM is digestible organic matter demand. This chart can be used as a reference in comparing plant performance versus the different beef cattle class nutritional demands.

Crude Protein and Digestibility Needs of Different Beef Classes (National Research Council, 1996)

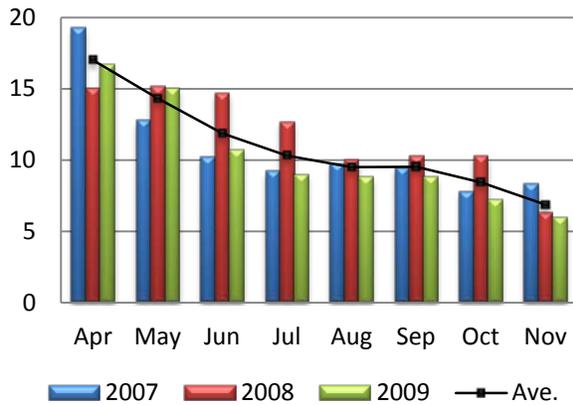
Beef Cattle Class	Age	Weight -----lb-----	CP -----%-----	DOM
Steer*	7 mo	500	15	63
Heifer*	8 mo	500	14	59
Dry cow	5 - 10 yr	1200	7	52
Lactating cow	5 - 10 yr	1200	10	58
Mid pregnant cow	5 - 10 yr	1200	9	57
*1.5 lb/day gain				

Reference:

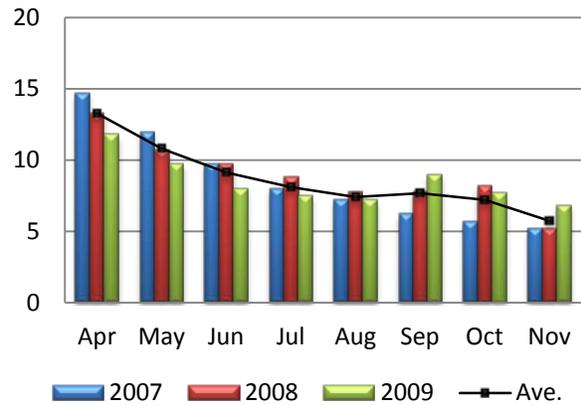
National Research Council. 1996. Nutrient requirements of beef cattle. 7th ed. National Acad. Press, Washington, DC.



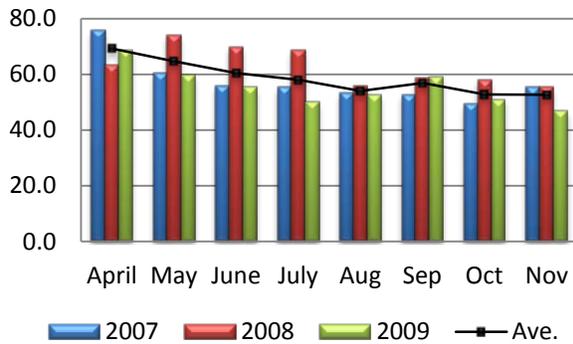
'Selection 75' CP %



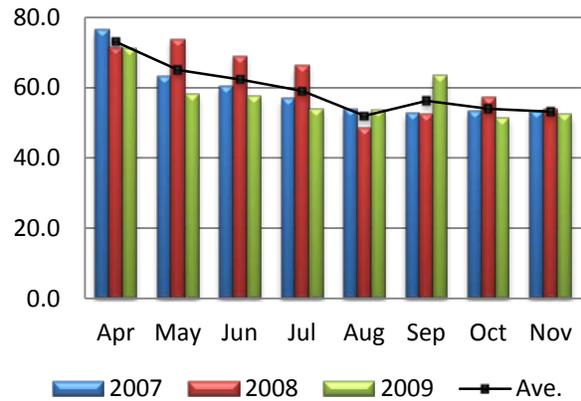
'Lometa' CP %



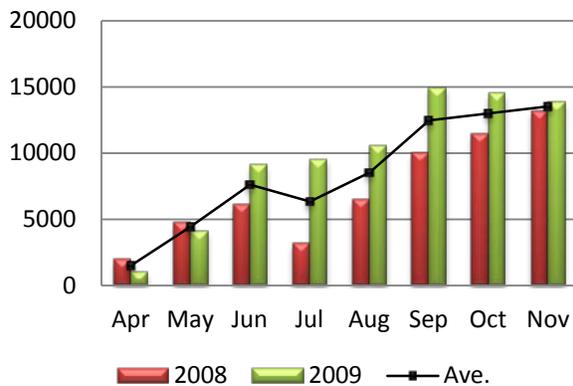
'Selection 75' Digestibility %



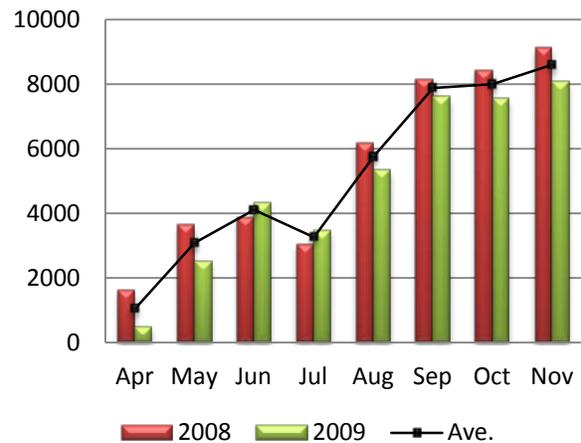
'Lometa' Digestibility %

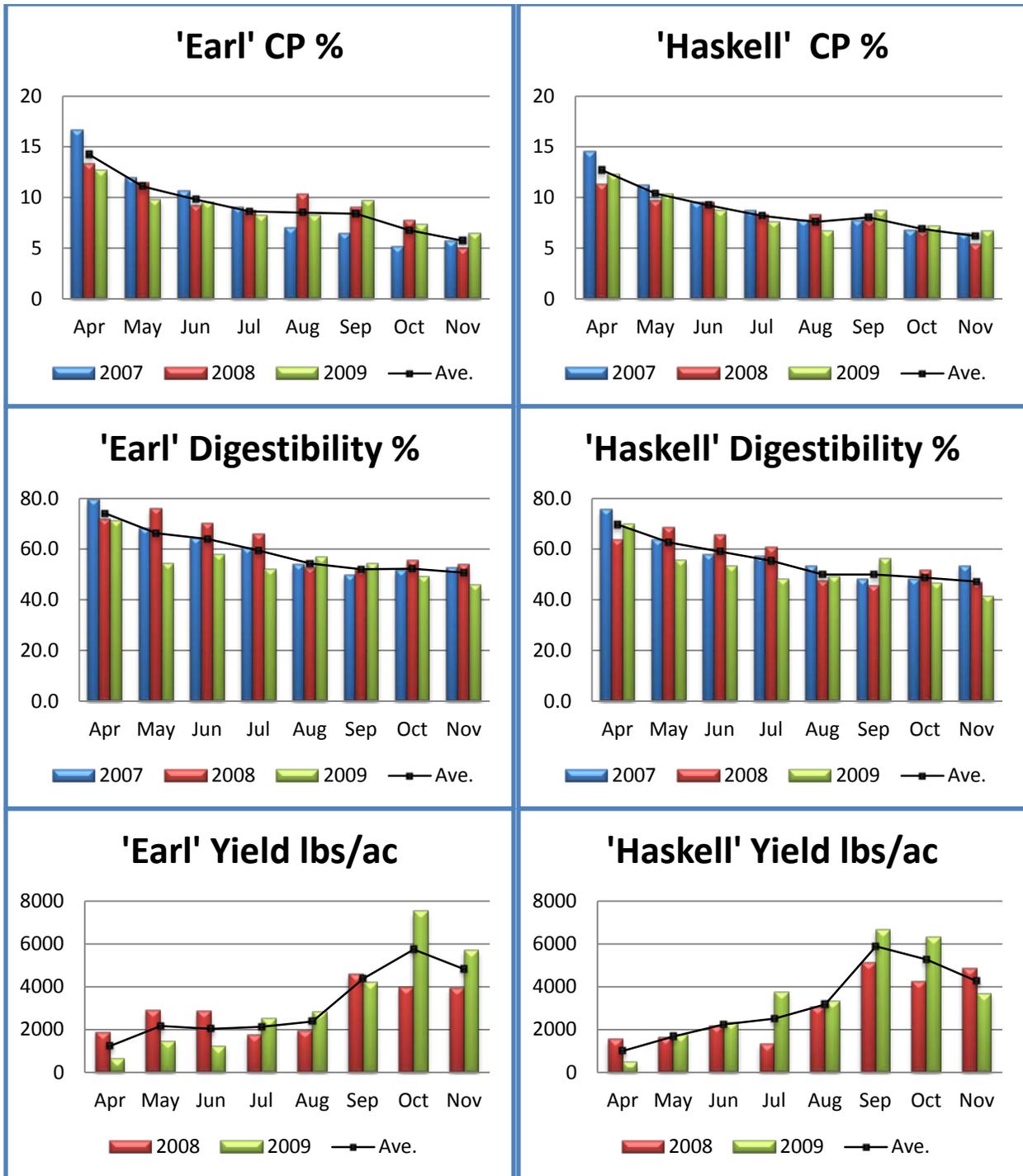


'Selection 75' Yield lbs/ac



'Lometa' Yield lbs/ac





The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, Large print, audiotape, etc.) should contact USDA's Target Center at 202-720-2600 (voice and TDD).

To file a complaint of discrimination, write USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call 800-795-3272 (voice) or 202-720-6382 (TDD). USDA is an equal opportunity provider and employee.