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FORAGE AND SILAGE PERFORMANCE OF WHEAT AND TRITICALE VARIETIES IN CENTRAL TEXAS

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Summary

A field trial was conducted in 1997-98 at the Texas A&M University Research and Extension Center in Stephenville to evaluate the forage and silage performance of four wheat and four triticale varieties. Forage results indicated no significant differences in total dry matter yield existed between any wheat variety. Presto (triticale) produced significantly higher yields than any wheat variety and two of the other triticale varieties. Silage results indicated that, when averaged over species, triticale produced slightly higher yields than wheat (10.4 vs. 10.0 tons @ 35% DM/A) but was lower in quality as indicated by higher concentrations of acid detergent fiber (ADF) and neutral detergent fiber (NDF). No differences in crude protein were observed. Differences in ADF and NDF suggest that variety selection for silage production should be based on quality in addition to yield.

Key Words: acid detergent fiber (ADF), crude protein, neutral detergent fiber (NDF), quality.

Introduction

Approximately 38% of the dairy cows in Texas are located within four counties of the Cross-Timbers region. These include Erath, Comanche, Hamilton, and Johnson counties. Beef cattle production is also an important agricultural enterprise in this region. Small grain silage is a high quality feed for both enterprises, ans small grains are well-adapted to the soils and environment in these counties. Consequently, there is a strong demand and need for current information about the performance of small grains for grazing and silage. Limited research about small grain silage production has been conducted in Texas.

Procedure

A field trial was initiated on September 25, 1997 at the Texas A&M University Research and Extension Center in Stephenville to evaluate the performance of four wheat (Lockett, TAM-202, Jagger, Custer) and 4 triticale (Presto, Hartman, Trit II, Triplecale) varieties for forage and silage. The experiment was

designed as a split-plot with variety as the whole plot and harvest method (grazing or silage) as the sub-plot. Each treatment was replicated 4 times. The varieties were seeded at the rate of 60 lbs/A and whole plot size was 4' X 16'. The plot area was fertilized prior to planting with 18-46-0 lbs/A then topdressed with nitrogen on October 17 (36-0-0 lbs/A), November 21 (75-0-0 lbs/A), and February 12 (30-0-0 lbs/A) for a total fertility program of 159-46-0 lbs/A. Peak 57WG @ 0.5 oz/A was applied on November 5 for broadleaf weed control. The entire plot area was irrigated (1") on October 3 to ensure stand emergence. Rainfall during this field trial, measured approximately 1.5 miles from the plot area, was 20 inches.

Forage yields were obtained by hand-clipping one row from each plot on December 12, February 11, March 25, and May 12. After clipping, the samples were oven-dried at 50^0C for three days, weighed, and yields converted to lbs/A dry matter (DM). After each hand-harvest, the entire plot area was mowed to simulate uniform grazing.

Silage yields were obtained by hand-clipping one row of each plot when the varieties were in the soft dough stage of growth. Samples were oven-dried at 50^0C for three days, weighed, and yields converted to tons/A at 35% DM. Additionally, five whole plants from each sub-plot were analyzed for crude protein, acid detergent fiber (ADF), and neutral detergent fiber (NDF) using wet chemistry techniques.

All data were subjected to analysis of variance and means were separated using Duncan's Multiple Range Test (P=0.10).

Results and Discussion

Forage: The forage performance of the wheat and triticale varieties evaluated in this study can be found in Table 1. No significant differences in yield were observed at any of the individual harvest dates. The total average dry matter yield of all triticale and wheat varieties was 3787 lbs/A and 3343 lbs/A, respectively. There were no significant differences in total yield between any of the wheat varieties. Presto was the highest yielding small grain variety in this experiment (4675 lbs/A DM) and produced significantly higher yields than any wheat variety and two of the other triticale varieties (Hartman, Triplecale).

Silage: The silage performance of the wheat and triticale varieties evaluated in this study can be found in Table 2. Generally when averaged over species, the triticale produced slightly higher silage yields than the wheat (10.4 vs 10.0 tons @ 35% DM/A) but was lower in quality as indicated by higher ADF and NDF concentrations. The average ADF for all wheat and triticale varieties was 30.8 and 34.6, respectively. The average NDF for all wheat and triticale varieties was 56.0 and 61.9, respectively. Lockett produced significantly higher yields than Jagger but not Custer or TAM-202. Silage yields of Presto, Hartman, and

Triplecale were similar. Trit II produced lower yields than Presto or Triplecale but not Hartman. No significant differences in crude protein were observed. Lockett had lower ADF and NDF values when compared to Custer but not the other wheat varieties. Differences in ADF and NDF suggest that variety selection should be based on quality in addition to yield.

Future research should continue to evaluate the yield and quality differences of small grain varieties for forage and silage, especially at different stages of maturity.

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Table 1. Forage yield of wheat and triticale varieties, Stephenville, TX, 1997-98.

Variety	Yield/Acre (lbs DM)				
	Harvest 1 12/11/97	**Harvest 2 2/11/98**	**Harvest 3 3/25/98**	**Harvest 4 5/12/98**	**Total**
Lockett (wheat)	201 a[1]	607 a	1633 a	531 a	2958 c
TAM-202 (wheat)	171 a	825 a	1775 a	566 a	3337 bc
Jagger (wheat)	313 a	759 a	1908 a	454 a	3784 bc
Custer (wheat)	286 a	566 a	1757 a	515 a	3292 bc
Presto (triticale)	260 a	697 a	2653 a	751 a	4675 a
Hartman (triticale)	214 a	538 a	2057 a	721 a	2986 c
Trit II (triticale)	162 a	260 a	1974 a	890 a	3911 ab
Triplecale (triticale)	188 a	587 a	1834 a	966 a	3576 bc
CV	**51**	**54**	**23**	**46**	**17**

[1]Means in the same column with the same letter are not significantly different according to DMRT (P = 0.10).

Table 2. Silage yield and quality of wheat and triticale varieties, Stephenville, TX, 1997-98.

Variety	Harvest Date	Yield/A[1] (tons @ 35% DM)	Harvest Moisture (%)	Crude Protein (%)	ADF (%)	NDF (%)
Lockett (wheat)	4-28-98	11.3 a[2]	54.3 a	6.5 a	29.8 e	54.4 e
TAM-202 (wheat)	4-24-98	9.9 ab	52.5 ab	6.6 a	30.3 de	55.9 de
Jagger (wheat)	4-24-98	8.3 b	52.4 ab	7.0 a	30.7 de	55.9 de
Custer (wheat)	4-24-98	10.6 ab	52.6 ab	6.9 a	32.5 cd	57.6 cd
Presto (triticale)	5-01-98	11.7 a	51.9 ab	7.4 a	32.0 de	57.9 cd
Hartman (triticale)	5-11-98	9.9 ab	47.6 cd	6.6 a	37.1 a	66.4 a
Trit II (triticale)	5-11-98	8.4 b	50.1 bc	7.2 a	35.2 ab	62.9 b
Triplecale (triticale)	5-12-98	11.7 a	46.0 d	6.9 a	34.2 bc	60.3 bc
CV		**17.4**	**4.2**	**13.9**	**5.1**	**3.7**

[1]All varieties were harvested in the soft dough stage.

[2]Means in the same column with the same letter are not significantly different according to DMRT (P = 0.10).