Small Grain Winter Forage Variety Testing, 2005-2006
NMSU Agricultural Science Center at Clovis

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Investigators

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Objective

To evaluate ensilage production potential through dry matter harvests and nutritive value of cool-season, small grain varieties submitted for testing at the Agricultural Science Center at Clovis.

Materials and Methods

This variety trial was planted on October 24, 2005 (Table 1). All 14 entries were planted in 50 $ft.^2$ plots under center pivot irrigation. Soil type is an Olton clay loam and elevation is 4,435 ft. Individual plots consisted of 11 rows, 5.5 inches apart and 10 feet long. Plots were planted at a rate of 100 lb/acre with a plot drill. The entry of SlickTrit triticale was planted at 110 lb/acre.

The planting area contained 98 lb N/ac and 28 lb P_2O5/ac as carryover. Plots were fertilized with 25 lbs/acre of nitrogen and 5 lbs/acre of sulfur on November 21, 2005. Additional N (15, 20 lb.) and S (5 lb.) applications were made on December 16 and March 23. All fertilizer applications were based on soil test results and recommendations. Lorsban 4E (1pt/acre) was applied on March 23, 2006 in order to control greenbug populations. Lo-Vol 6 (2,4-D) herbicide was applied on March 23 for weed control.

Total irrigation for the growing season was 11.5 inches, with the majority of water applied in April. Precipitation during the test was minimal and only 2.4 inches were received from late October to April.

These small grains were managed for a one-cut, silage oriented harvest in spring of 2006 (Table 1). Harvests began on April 17, 2006 with the earliest maturing species (barley) and continued through April 27. Plants were harvested at boot stage (Feekes scale: 10.0-10.3; Zadoks scale: 45-53) for maximum forage quality. Although yield is maximized at later growth stages, cutting earlier at boot to early head stages allows for a balance of good yields and optimum nutritive

value. Considering the high nutritional needs of dairy cattle in the region and the common practice of double cropping with corn or sorghum, an early cutting of forages was deemed most appropriate for the area. All plots were harvested with a sickle bar mower set at a height of 2 inches, and total plot weights were obtained to estimate yield on both a green forage and dry matter basis.

Statistical Analysis

Species/varieties were assigned randomly to plots in a completely randomized block design with 3 replications. Data were subjected to SAS® procedures for test of significance for differences ($P < 0.05$) among entries and mean separation procedures (protected least significant difference) were used to determine where differences occurred.

Results and Discussion

Yield data for 2005-2006 are presented in Table 2; and forage quality data are presented in Table 3. Final results from 2006 harvests will be presented in the annual report for 2006 and in other periodic reports and presentations from the Agricultural Science Center at Clovis. Minimal precipitation likely affected overall yields of the small grains as mean dry forage was 3.5 tons/ac for the trial. Dry forage produced ranged from 2.6 to 4.4 tons/ac. Forage nutritive value declined with increased yield. The general trend was that as dry matter yield increased, crude protein and NE_l were reduced and fiber proportions increased. Although all varieties were harvested at the same maturity stage, often times greater yields result in proportionately less protein and increased fiber (NDF). Nitrogen removed from the soil in 2005-2006 averaged about 232 lb N/acre and ranged from 184 to 276 lb N/acre.

Table 1. Winter Annual Small Grain Forages, 2005-2006, Agricultural Science Center at Clovis

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Test Description

Location:

County/Area:	Curry
Longitude:	-103.22
Latitude:	34.60
Elevation:	4435 ft.
Soil Name:	Olton
Soil Texture:	clay loam
Soil Depth:	>60 in.

Test Design:

Replications	4
Plot Length:	10 ft.
Plot Width:	5 ft.
Rows per Plot:	11
Drill Row Spacing:	5.5 in.

Seeding Rate:

SlickTrit:	110 lb/a
All Other Entries:	100 lb/a

Management Practices:

Previous Crop:	fallow
Planting Date:	24-Oct

Forage Harvest - Single harvest per plot

Harvest Dates: 17-April to 27-April

(Mechanically harvested all of each plot based on stage of maturity. Clipping height was 1 to 2 in.)

Production Inputs

	Rate		Date
Fertilizer:			
Nitrogen	98	lb/ac	Carryover
Nitrogen	25	lb/ac	21-Nov
Nitrogen	15	lb/ac	16-Dec
Nitrogen	20	lb/ac	23-Mar
P2O5	28	lb/ac	Carryover
S	5	lb/ac	21-Nov
S	5	lb/ac	16-Dec
S	5	lb/ac	23-Mar
Herbicides:			
Lo-Vol 6	1	pt/ac	23-Mar
Instecticides:			
Lorsban 4E	1	pt/ac	23-Mar

Growing Conditions:

	Average Temp.	Precip.	Irrigation
	°F	in.	in.
October	58.1	1.47	0.00
November	49.9	0.00	1.55
December	39.4	0.00	0.80
January	42.8	0.00	1.60
February	40.9	0.09	1.00
March	48.0	0.61	1.00
April	59.8	0.25	5.50

Seasonal Precipitation	2.4 in.
Total Irrigation	11.5 in.

Table 2. Forage Harvest - Winter Annual Small Grain Forages - 2005-2006 Various Dates - NMSU Agricultural Science Center at Clovis

Company Name	Variety Name	Species †	Harvest Date	Green Forage	Dry Forage	Moisture at Harvest	Milk/ Ton	Milk/ Acre	N removal
				T/ac	T/ac	%	lb/ton	lb/ac	lb N/ac
Watley Seed Co.	SlickTrit	T	27-Apr	22.0 ***	4.4 ***	80.0 *	3395	14872 ***	276 ***
Paramount Seed Farms	P-919	B	17-Apr	19.1	4.2 *	78.0	3315	13902 *	259 *
Paramount Seed Farms	Tambar 501	B	17-Apr	18.5	4.1 *	78.0	3633 *	14759 *	275 *
Agri-Pro	TAMCALE	T	21-Apr	19.4 *	4.1 *	78.9	3395	13756 *	268 *
Kelly Green Seeds	Triplecale	T	21-Apr	20.7 *	4.1 *	80.1 *	3402	13870 *	268 *
Kelly Green Seeds	Pound Plus B	W/O/T	27-Apr	18.2	3.8	79.0	3415	12993	235
Curtis & Curits Inc	Master blend	W/O/T	27-Apr	19.2 *	3.7	80.7 ***	3477	12859	236
Curtis & Curits Inc	Maximizer	W/T	27-Apr	15.8	3.4	78.3	3494	11958	220
Paramount Seed Farms	Kanbar-04	B	17-Apr	14.4	3.2	78.0	3669 *	11603	217
Agri-Pro	TAM 111	W	20-Apr	13.7	3.2	76.7	3382	10757	206
Curtis & Curits Inc	Smooth Grazer	W/T	21-Apr	14.9	3.1	79.0	3461	10858	211
Agri-Pro	Dumas	W	20-Apr	12.6	2.9	77.0	3667 *	10621	198
Agri-Pro	Cutter	W	21-Apr	11.9	2.9	75.4	3624 *	10658	197
Agri-Pro	Jagalene	W	20-Apr	11.0	2.6	76.2	3741 ***	9775	184
			Trial Mean	16.5	3.5	78.2	3504	12374	232
			LSD (0.05)	2.8	0.5	1.4	136	1474	31.4
			CV	12.0	9.6	1.2	2.7	8.3	9.5
			F Test	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

†O=oat; R=rye; T=triticale; W=wheat

All plots were harvested at Feekes stage 10.0-10.3; 10.0=sheath of flag leaf completely grown out, ear not visible; 10.3= half of heading process complete.

*** Highest numerical value in the column.

* Not significantly different from the highest numerical value in the column based on the 5% LSD.

Table 3. Forage Harvest - Winter Annual Small Grain Forages - 2005-2006 Various Dates - NMSU Agricultural Science Center at Clovis

Company Name	Variety Name	Species †	Harvest Date	CP	ADF	NDF	dNDF Dig. 48h	Non-Fiber Carb.	TDN	NE_l
				% of DM	% of DM	% of DM	% of NDF	% of DM	% of DM	Mcals/lb
Watley Seed Co.	SlickTrit	T	27-Apr	19.7	32.3 *	48.6 *	76.1	23.9	66.8	0.69
Paramount Seed Farms	P-919	B	17-Apr	19.3	33.0 ***	48.8 ***	75.1	23.3	65.8	0.68
Paramount Seed Farms	Tambar 501	B	17-Apr	21.1 *	31.3 *	45.7	81.0 *	25.0	69.7 *	0.72
Agri-Pro	TAMCALE	T	21-Apr	20.6	32.0 *	47.2 *	75.8	24.0	66.8	0.69
Kelly Green Seeds	Triplecale	T	21-Apr	20.5	32.1 *	47.3 *	76.8	23.5	66.8	0.69
Kelly Green Seeds	Pound Plus B	W/O/T	27-Apr	19.2	32.2 *	48.0 *	75.7	25.3	67.1	0.69
Curtis & Curits Inc	Master blend	W/O/T	27-Apr	20.0	31.8 *	47.3 *	77.5	24.6	67.8	0.70
Curtis & Curits Inc	Maximizer	W/T	27-Apr	20.1	30.8	46.6	76.8	25.7	68.1	0.70
Paramount Seed Farms	Kanbar-04	B	17-Apr	21.4 *	30.6	44.9	81.3 ***	25.4	70.1 *	0.73 *
Agri-Pro	TAM 111	W	20-Apr	20.3	31.4 *	46.7 *	75.2	24.7	66.7	0.69
Curtis & Curits Inc	Smooth Grazer	W/T	21-Apr	21.1 *	31.5 *	46.3	77.5	24.1	67.6	0.70
Agri-Pro	Dumas	W	20-Apr	21.4 *	28.3	42.9	81.1 *	27.6 *	70.1 *	0.73 *
Agri-Pro	Cutter	W	21-Apr	21.0 *	28.2	43.3	79.3 *	27.6 *	69.7 *	0.72 *
Agri-Pro	Jagalene	W	20-Apr	22.0 ***	27.2	41.7	81.1 *	28.6 ***	71.2 ***	0.74 ***
			Trial Mean	20.5	30.9	46.1	77.9	25.2	68.2	0.70
			LSD (0.05)	1.0	1.7	2.1	2.4	1.9	1.7	0.02
			CV	3.4	3.8	3.2	2.2	5.4	1.8	1.9
			F Test	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001

†O=oat; R=rye; T=triticale; W=wheat

All plots were harvested at Feekes stage 10.0-10.3; 10.0=sheath of flag leaf completely grown out, ear not visible; 10.3=half of heading process complete.

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