COMPARISON OF 23 ALFALFA VARIETIES ON PLANT STAND AND YIELD IN NO-TIL AND CONVENTIONAL TILLAGE SYSTEMS

Joe, Travis, James, Stephen and Carol Janak, Cooperators, (2005-2006)
Joe Janak, Sam Womble, County Extension Agent - Ag/NR, County Extension Agent - NR, respectively
Victoria County

SUMMARY:

Planting alfalfa in a heavy clay soil is not the ideal recommendation. While the drought was overcome with the clay's subsoil moisture, the excessive rains reduced plant stand to allow only one year of production resulting in only two harvests for a crop that should be a perennial. There seemed to be a difference in plant growth in the no-til verses conventional but the yields reserved in the second cutting verses the first cutting. Statistical differences were noted but most varieties had no statistical difference. There appeared to be a trend over all harvests and tillage systems with the following varieties yielding better: Beacon, Sequoia, Yosemite, WL 625HQ, SW 10, WL 530 HQ, Cibola, AL999, CUF 101 and UN900.

OBJECTIVES:

To determine the best all-around alfalfa variety to plant. To determine if no-til and conventional tillage systems had any affect on yield.

MATERIALS and METHODS:

Twenty-three of the best alfalfa varieties donated by the best alfalfa seed companies were gathered and planted with a John Deere Grain Drill on conventional tilled and no-til DaCosta Contee complex soil that is typical of a dark, heavy clay type soil. Planting took place on November 13, 2005 planting 1/4 - 1/2 inch deep. Seed was covered by dragging a heavy chain behind the grain drill. Plots were 5' x 10' each or 0.001 acre and were replicated three times in a randomized complete block design in each tillage system.

Moisture was minimal but adequate at planting. Fertilizer broadcast prior to planting was 0-90-0 per acre slightly above soil tests recommendations. All seed was either seed-company treated with the proper inoculant or hand treated prior to planting. The cibola variety was planted inoculated singly and 4 times as a trial. No insecticide or herbicide was used at planting. Some varieties were treated with a fungicide by the company.

Due to drought conditions, irrigation was utilized periodically. Harvest occurred April 13, 2006 and June 22, 2006 by hand-held electric clippers with the forage field dried and weighed for each individual plot.

RESULTS and DISCUSSIONS:

Drought conditions set in after planting and to insure quality stands the plots were watered as germination was taking place and moisture was getting very minimal. All varieties produced a good stand (85 - 90 % stand) of alfalfa by December 27, 2005 although small differences were noted initially. The first four months of the year were very dry as the drought continued but alfalfa growth was good due to the higher level of subsoil moisture in the heavy clay.

After the first cutting on April 13, 2006, due to the continued drought, 3.3 inches of rain equivalent supplemental irrigation was provided through a surface drip irrigation system. The second cutting was made due to the supplemental irrigation and the June rains. Adequate rainfall was received just before the second cutting. The herbicide Accent was applied at 10 oz/a for weed control on June 10, 2006. Due to 14 inches of rain in June and July, weed encroachment, and cotton root rot, the stand quality diminished and became quite variable showing inconsistent patterns of stand loss by the second cutting. Yield estimates were given based on percent weed infestation and plant growth on about fifty percent of the plots on the second harvest. Stand loss was so extensive and weed pressure high enough to abandon the third and subsequent harvests. The majority of the stand loss was due to cotton root rot. Due to weed infestations on the second harvest, harvests with and without weeds were made on several plots to more accurately provide visual yield estimates on about 50 % of the plots that had high weed infestations due to reduced stand.

ACKNOWLEDGMENTS:

Appreciation is expressed to the contributing seed companies listed in this demonstration and to David Bussell and Janet Goode, Victoria Demonstration Assistants. Contributing seed companies were: Douglas King Co., Forage Genetics International, Pogue, S & W Seed Co., W L Alfalfas, Westec, Inc.

DISCLAIMER CLAUSE:

Trade names of commercial products used in this report are included only for better understanding and clarity. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Texas A&M University System is implied. Readers should realize that results from one experiment do not represent conclusive evidence that the same response would occur where conditions vary.

Table 1. Average yield of three replications for 23 alfalfa varieties on first cutting - April 13, 2006 planted conventional and no-til in order by yield. Joe, Travis, James, Stephen and Carol Janak, Cooperators, Victoria County TX, 2005 - 2006.

CONVENTIONAL TILLAGE [1/]			NO-TIL [1/]			FIRST HARVEST OVERALL AVERAGE [2/]	
Variety	Lbs/A	Stat.	Variety	Lbs/A	Stat.	Variety	Lbs/A
CG9	1702	a	Cibola	1 296	a	Sequoia	1391
Beacon	1600	ab	SW 10	1 296	a	Cibola	1384
Sequoia	1562	ab	SW 9720	1 245	ab	Beacon	1384
CUF 101	1550	ab	AL999	1 245	ab	SW 10	1372
WL 530HQ	1499	ab	Sequoia	1 219	ab	CUF 101	1308
Cibola	1473	ab	Rio Grande	1 194	ab	SW 9720	1296
SW 10	1448	ab	Highline	1 169	ab	CG9	1296
UN900	1397	ab	Beacon	1 169	ab	UN900	1283
SW 9720	1346	ab	UN900	1 169	ab	AL999	1232
Sedona	1346	ab	WL 535HQ	1 092	abc	Rio Grande	1219
Yosemite	1346	ab	CUF 101	1 067	abc	Sedona	1194
Ameristand 802S	1321	ab	Sedona	1 042	abc	WL 530HQ	1181
HB8900	1296	ab	SW 9628	1 016	abc	WL 535HQ	1156
Salado	1270	ab	WL 625HQ	991	abc	Ameristand 802S	1143
HB8800	1245	ab	Salado	965	abc	Yosemite	1130
Rio Grande	1245	ab	Ameristand 802S	965	abc	Salado	1118
WL 535HQ	1219	ab	SW 8718	965	abc	WL 625HQ	1092
AL999	1219	ab	Yosemite	914	abc	HB8900	1092
WL 625HQ	1194	ab	CG9	889	abc	SW 9628	1092
SW 9628	1169	ab	HB8900	889	abc	Highline	1080
SW 8718	1143	ab	WL 530HQ	864	abc	SW 8718	1054
Cibola Inoc. X 4	1016	bc	HB8800	762	abc	HB8800	1003
Highline	991	bc	Cibola Inoc. X 4	610	bc	Cibola Inoc. X 4	813
Dura 843	533	c	Dura 843	508	c	Dura 843	521
Average	1297		Average	1 022		Average	1160

[1/] Means followed by the same letter do not significantly differ (P=.05, Duncan's New MRT).

[2/] Statistical analysis can not be utilized when averaging these two demonstrations (Conventional and No-til) due to a combination of two different treatments. The overall average is given only for information purposes.

Table 2. Average yield of three replications for 23 alfalfa varieties on the second cutting - June 22, 2006 planted conventional and no-til in order by yield. Joe, Travis, James, Stephen and Carol Janak, Cooperators, Victoria County TX, 2005 - 2006.

CONVENTIONAL TILLAGE [1/]			NO-TIL [1/]			SECOND HARVEST OVERALL AVERAGE [2/]	
Variety	Lbs/A	Stat.	Variety	Lbs/A	Stat.	Variety	Lbs/A
Beacon	1897	ab	Cibola	2519	a	Beacon	2119
WL 625HQ	1748	abc	Yosemite	2430	ab	WL 625HQ	2015
Yosemite	1600	abcd	Beacon	2341	abc	Yosemite	2015
HB8800	1571	abcd	Sedona	2341	abc	HB8800	1852
WL 530HQ	1452	abcd	Highline	2282	abcd	WL 530HQ	1808
Ameristand 802S	1452	abcd	WL 625HQ	2282	abcd	Sequoia	1808
AL999	1422	abcd	SW 9720	2282	abcd	Highline	1793
Sequoia	1363	abcd	Sequoia	2252	abcd	WL 535HQ	1763
Highline	1304	abcd	WL 535HQ	2223	abcd	AL999	1748
WL 535HQ	1304	abcd	SW 10	2223	abcd	SW 10	1704
SW 10	1185	abcd	SW 9628	2223	abcd	SW 9628	1704
SW 9628	1185	abcd	UN900	2193	abcd	Ameristand 802S	1674
CUF 101	1126	abcd	WL 530HQ	2163	abcd	CUF 101	1645
Rio Grande	1126	abcd	CUF 101	2163	abcd	Rio Grande	1615
Cibola Inoc. X 4	1067	abcd	HB8800	2134	abcd	Cibola	1600
Dura 843	1067	abcd	CG9	2134	abcd	UN900	1600
UN900	1008	abcd	Rio Grande	2104	abcd	SW 9720	1585
CG9	1008	abcd	Salado	2104	abcd	CG9	1571
SW 9720	889	abcd	AL999	2074	abcd	Cibola Inoc. X 4	1571
Cibola	682	bcd	Cibola Inoc. X 4	2074	abcd	Dura 843	1497
HB8900	652	cd	SW 8718	2074	abcd	Sedona	1408
SW 8718	563	cd	Dura 843	1926	bcd	SW 8718	1319
Sedona	474	d	Ameristand 802S	1897	cd	Salado	1259
Salado	415	d	HB8900	1778	d	HB8900	1215
Average	1148		Average	2176		Average	1662

[1/] Means followed by the same letter do not significantly differ (P=.05, Duncan's New MRT). Due to weed infestations, harvests with and without weeds were made on several plots to more accurately provide visual yield estimates on about 50 % of the plots.

[2/] Statistical analysis can not be utilized when averaging these two demonstrations (Conventional and No-til) due to a combination of two different treatments. The overall average is given only for information purposes. Due to weed infestations on the second harvest, harvests with and without weeds were made on several plots to more accurately provide visual yield estimates on about 50 % of the plots that had high weed infestations due to reduced stand.

Table 3. Average yield of three replications for 23 alfalfa varieties on the first and second cutting - April 13, 2006 and June 22, 2006 planted conventional and no-til in order by yield. Joe, Travis, James, Stephen and Carol Janak, Cooperators, Victoria County TX, 2005 - 2006.

CONVENTIONAL TILLAGE		NO-TIL		APRIL & JUNE HARVEST OVERALL AVERAGE [1/]	
Variety	**Lbs/A**	**Variety**	**Lbs/A**	**Variety**	**Lbs/A**
Beacon	3497	Cibola	3815	Beacon	3503
WL 530HQ	2951	SW 9720	3527	Sequoia	3199
Yosemite	2947	SW 10	3518	Yosemite	3146
WL 625HQ	2942	Beacon	3510	WL 625HQ	3107
Sequoia	2925	Sequoia	3472	SW 10	3076
HB8800	2815	Highline	3450	WL 530HQ	2989
Ameristand 802S	2773	Sedona	3383	Cibola	2985
CG9	2710	UN900	3362	AL999	2980
CUF 101	2676	Yosemite	3345	CUF 101	2953
AL999	2642	AL999	3319	WL 535HQ	2919
SW 10	2633	WL 535HQ	3315	UN900	2883
WL 535HQ	2523	Rio Grande	3298	SW 9720	2881
UN900	2405	WL 625HQ	3273	Highline	2873
Rio Grande	2371	SW 9628	3239	CG9	2866
SW 9628	2354	CUF 101	3230	HB8800	2856
Highline	2295	Salado	3069	Rio Grande	2834
SW 9720	2235	SW 8718	3040	Ameristand 802S	2817
Cibola	2155	WL 530HQ	3027	SW 9628	2796
Cibola Inoc. X 4	2083	CG9	3023	Sedona	2602
HB8900	1948	HB8800	2896	Cibola Inoc. X 4	2384
Sedona	1820	Ameristand 802S	2862	Salado	2377
SW 8718	1706	Cibola Inoc. X 4	2684	SW 8718	2373
Salado	1685	HB8900	2667	HB8900	2307
Dura 843	1600	Dura 843	2434	Dura 843	2017
Average	2445	Average	3198	Average	2822

[1/] Statistical analysis can not be utilized when averaging these two demonstrations (Conventional and No-til) due to a combination of two different treatments. The overall average is given only for information purposes. Due to weed infestations on the second harvest, harvests with and without weeds were made on several plots to more accurately provide visual yield estimates on about 50 % of the plots that had high weed infestations due to reduced stand.