North Dakota State University * Dickinson Research Extension Center
1133 State Avenue, Dickinson, ND 58601 Voice: (701) 483-2348 FAX: (701) 483-2005

HAY YIELDS FROM GRASS AND GRASS-ALFALFA MIXTURE PLOTS

Crested Wheatgrass Trial:

Hay yields of the crested wheatgrass varieties seeded in 1958 are given in Table 1. The 1965 average yield of all varieties at 1647 pounds per acre was very good, comparing favorably with the 1962 production in the case of most varieties. The 1965 production, however, was not quite as good as the 1962 production, and it was appreciably lower than the record average production of these varieties at 1911 pounds per acre, obtained in 1963. The average of all varieties for the 7 years of the trial is 1397 pounds per acre.

The standard crested wheatgrass derivatives have continued to be the highest producing varieties, including summit, Standard, Nebraska 10, and Nordan. While there have been variations in yields between these varieties from year to year, the overall average yields for the 7-year period can hardly be considered as differing significantly. The production of these four varieties has averaged about 3/4 ton per acre. The Fairway-derived varieties have produced slightly less than the Standard-derived varieties over the period of the trial, but they have produced very well. An exception to this is the Turkish Fairway trial, which has been a consistently low-producer throughout the trial period. The average production of this grass for the period has been only 1028 pounds per acre. It has appeared to be in relatively low vigor at all times during the trial.

Nearly all of the plot stands of the varieties in this trial are still in excellent condition, with the only exception again being the stands on the Turkish Fairway plots. In these plots rather serious stand deterioration has taken place, and weeds and other grasses have invaded. It is possible that some of the production of the last few years on these plots has been from the invading crested wheatgrass varieties which have replaced to some extent the Turkish variety.

Table 1. Hay Yields From Crested Wheatgrass Varieties Seeded in 1958.

Variety	Dry Weight Yield - Pounds per acre	7 Year

	1959	1960	1961	1962	1963	1964	1965	Average Yield
Summit Crested	1328	1614	856	2023	1995	889	2011	1531
Commercial Crested	1452	1815	824	2080	1978	818	1538	1500
Nebraska 10	1137	1791	864	1890	2109	871	1784	1492
Nordan Crested	1427	1461	806	2006	2069	910	1669	1478
Mandan 2359	1157	1687	833	1678	2119	864	1808	1462
Nebraska 3576 Fairway	1371	1605	905	1680	1846	715	1650	1396
Commercial Fairway	1425	1619	873	1759	1734	887	1435	1390
South Dakota 15	1164	1546	770	1556	1788	712	1523	1296
Turkish Fairway	753	930	562	1338	1558	747	1308	1028
Average	1246	1563	810	1790	1911	824	1647	1397

Station Grass and Mixture Trial:

Yields of the mixtures and straight grass seedings in this trial are given in tables 2, 3, and 4. The 1965 yields of the grass-alfalfa mixtures are given in table 2, and the 7-year average yields of the mixtures are given in table 3. Table 4 gives the 7-year average yields of the straight grass seedings in the trial. Overall 1965 production of the grass-alfalfa mixtures at an average of 3,404 pounds per acre was the second highest yield thus far obtained in the trial. The highest average yield of the mixtures in this trial was 4,123 pounds per acre obtained in 1963. The overall 1965 average yield of the straight grass seedings at 2,271 pounds per acre was very good, but the yields of 2,839 pounds obtained in 1960, and 2,443 pounds in 1963, were both appreciably better than the 1965 production.

The data of table 2 shows that alfalfa continues to be an important component of the yield in nearly all of the grass-alfalfa mixtures on the basis of the average production of all plots 46.1 percent of the yield was produced by alfalfa.

In the four highest producing mixtures in the 1965 season alfalfa made up 62, 40, 50, and 68 percent of the yields, respectively. The four highest producing mixtures in the 1965 season were 1-Green stipa-Teton alfalfa; 2-Lincoln brome-Ladak alfalfa; 3-Lincoln brome-Teton alfalfa; and 4-Nordan crested-Teton alfalfa. Alfalfa has consistently produced a smaller portion of the total yield in the Russian wildrye-alfalfa mixtures than in other mixtures. In the 1965 season alfalfa produced 22.5 percent of the yield in the Russian wildrye-Ladak alfalfa mixture and only 15.5 percent of the yield from the Russian wildrye-Teton alfalfa mixture.

The grass-alfalfa mixtures produced an average of 50 percent more total yield than did the straight grass seedings in the 1965 season. Over the period of the trial the grass-alfalfa mixtures have produced about 33 percent more than the straight grass seedings. The nordan crested-Teton alfalfa mixture has been the highest producing mixture over the period of the trial, although it was only fourth highest in the 1965 season. Lincoln brome-Ladak alfalfa and Lincoln brome-Teton alfalfa have averaged closest to the nordan-Teton mixture for the trial period.

Production of the nordan crested-Teton alfalfa mixture for the 7-year period has averaged 34.7 percent greater than the production of the straight nordan crested seedings. The average yield of the Lincoln brome-Ladak alfalfa combination has been 31.7 percent greater than the average yield of Lincoln brome alone. The Lincoln brome-Teton mixture has averaged 28.2 percent greater in yield than Lincoln brome alone. The green stipa-alfalfa combinations have produced substantially better than green-stipa alone, with the average for the green stipa-Teton mixture being 65.5 percent greater than for straight green stipa, and the green stipa-Ladak combination averaging 37.7 greater yield than green stipa alone. The Russian wildrye-alfalfa combinations have averaged about 20 percent greater production than straight Russian wildrye (2355) over the period of the trial.

In the straight grass seedings Nebraska 50 intermediate wheatgrass has maintained a very good yield over the period of the trial and by a slight margin continues as the highest-producing variety, although several of the varieties outyielded it in the 1965 season (table 4). The average yield of the Nebraska 50 Intermediate at 2,280 pounds per acre is just slightly better than the average yields of the next four closest varieties. Intermediate, Summit crested, Lincoln brome, nordan crested, and Southland brome all have average yields of over 1 ton per acre for the period of the trial.

Some stand deterioration has taken place in some of the plots, particularly in the grass-alfalfa mixture plots. Where

the alfalfa has decreased in the plots, serious invasions of crested wheatgrass have taken place. The extent to which crested wheatgrass has invaded is shown in the data of Table 2. Almost all the grass referred to as "Other Grass" is crested wheatgrass. The slender wheatgrass plots, as would be expected, have now gone almost entirely to crested wheatgrass and are no longer harvested. The green stipa plots have continued to improve in stand density and production, and the western wheatgrass plots showed great improvement in the 1965 season. A fair amount of crested wheatgrass does occur in these latter plots.

Table 2. Composition of 1965 Hay Yields From Station Grass-Alfalfa Mixture Trial Seeded in 1958.

Mixtures	Dry-Weight Yields - Pounds Per Acre				Total Yield
	Grass	Alfalfa	Other Grass	Weeds	
Green Stipa - Teton Alfalfa	1338	2950	493	---	4781
Lincoln Brome - Ladak Alfalfa	2233	1643	229	---	4150
Lincoln Brome - Teton Alfalfa	1817	1989	178	---	3984
Nordan Crested - Teton Alfalfa	1249	2692	21	---	3962
Green Stipa - Ladak Alfalfa	1497	1385	835	---	3717
Intermediate Wheatgrass - Ladak Alfalfa	1262	1370	887	---	3519
Lincoln Brome - Nordan Crested - Ladak Alfalfa	1992	1410	8	---	3410
Manchar Brome - Ladak Alfalfa	2026	1029	204	---	3259
Intermediate Wheatgrass - Teton Alfalfa	665	1813	591	5	2942
Russian Wildrye (2355) - Ladak Alfalfa	1590	463	---	5	2058
Green Stipa (New) - Ladak Alfalfa	891	1784	242	25	2942

Russian Wildrye (2355) - Teton Alfalfa	1694	317	10	20	2041
Average	1521	1570	308	5	3404

Table 3. Average Hay Yields From Station Grass-Alfalfa Mixture Trial Seeded in 1958.

Mixtures	Dry-Weight Yields - Pounds Per Acre							Average Yield
	1959	1960	1961	1962	1963	1964	1965	
Nordan Crested - Teton Alfalfa	2359	3396	1360	2970	3959	1691	3961	2814
Lincoln Brome - Ladak Alfalfa	2171	3272	903	2824	4542	1534	4105	2765
Lincoln Brome - Teton Alfalfa	2329	2765	943	2682	4441	1698	3984	2692
Lincoln Brome-Nordan Crested-Ladak Alf.	2447	3204	1195	2663	3642	1862	3410	2632
Intermediate Wheatgrass - Teton Alfalfa	3144	3381	647	2421	4182	1255	3075	2586
Manchar Brome - Ladak Alfalfa	2127	2764	692	2237	3654	1315	.3259	2293
Intermediate Wheatgrass - Ladak Alfalfa	2818	3258	755	-[1]	4093	1440	3519	2269
Russian Wildrye (2355) - Teton Alfalfa	1449	2307	786	1825	2859	1307	2040	1796
Russian Wildrye (2355) - Ladak Alfalfa	1653	1716	711	2201	2526	1220	2058	1726
Green Stipa (New) - Ladak Alfalfa	---	---	---	3006	5714	1365	2942	3257[2]
Green Stipa - Teton Alfalfa	---	---	642	2684	5579	1678	4781	3073[3]
Green Stipa - Ladak Alfalfa	---	---	1035	2344	4290	1406	3717	2558[3]

Average	2297	2896	879	2321	4123	1481	3404	2538

[1]No harvestable yield in 1962.

[2]Only 4 years yield data.

[3]Only 5 years yield data.

Table 4. Average Hay Yields From Station Grass Trial Seeded in 1958.

Grasses	Dry Weight Yields - Pounds Per Acre							7-Year Average Yield
	1959	1960	1961	1962	1963	1964	1965	
Intermediate Wheatgrass (Neb. 50)	2865	3440	743	1855	3167	1450	2439	2280
Summit Crested	2653	3310	1272	2317	2339	1138	2390	2203
Lincoln Bromegrass	2559	3107	971	2185	2507	799	2572	2100
Nordan Crested	2364	3203	1259	2032	2475	1117	2172	2089
Southland Brome	2344	3293	750	2141	2442	703	2640	2045
Manchar Brome	2332	2560	707	1937	2284	974	2391	1884
Northern Brome	2324	2876	540	1818	2035	763	2075	1776
Russian Wildrye (2355)	1368	2086	686	1727	1929	913	1478	1455
Russian Wildrye (Com.)	1404	1913	756	1530	1574	1008	1522	1387
Slender Wheatgrass	1937	2601	---	---	2531	---	---	---

Green Stipa (New)	---	---	755	2441	3118	1118	2354	(1971)*
Green Stipa (Com.)	---	---	608	1916	2912	1237	2613	(1857)*
Western Wheatgrass	---	---	---	---	---	934	2609	(1305)*
Average	2215	2839	833	1991	2443	1019	2271	1913
*Not included in average yield of all grasses.								

Dryland Alfalfa Plots:

The 1965 yields from the dryland alfalfa plots seeded in 1960 are given in table 5, and the 5-year average yields for the period of the trial are given in table 6. Two cuttings were made in the 1965 season and excellent yields were obtained because of favorable seasonal moisture conditions. The average yield of all varieties was the highest yet obtained in this trial, with the average of 5378 pounds per acre being just slightly better than the 1962 average yield of 5274 pounds per acre. Most of the plot stands showed appreciable additional recovery from the damage suffered in the winter of 1963-1964. However by the end of the 1965 season it was apparent that the stands of Du Puits had failed entirely, and of the 4 plots of Scandia and the 4 plots of Pfister, only 1 plot of each remained in harvestable condition.

The highest yielding variety in the 1965 season in this trial was South Dakota (H-2157), with a production of 6027 pounds per acre (oven-dry weight). Approximately 74 percent of this yield was produced in the first cutting. Ladak and Rhizoma produced very nearly as much as South Dakota (H-2157) with yields of 5888 and 5792 pounds per acre, respectively, Ladak produced 74 percent of its yield from the first clipping, while Rhizoma produced about 70 percent. As the average for all varieties, 69.5 percent of the yield was produced from the first clipping, and 30.5 percent from the second clipping. This contrasts to the 1964 season, when 46 percent of the total yield was produced from the first clipping and 54 percent from the second clipping. In the 1965 season, all varieties except Pfister, Ranger, and of course Du Puits, produced over 5000 pounds per acre from the two cuttings.

The 5-year average yields given in table 6 show that Ladak, Rambler, Vernal, and South Dakota (H-2157) have been the high producers in the trial, all averaging over 3800 pounds per acre for the period. Rhizoma, Teton, and Grimm have all averaged over 3700 pounds per acre. The range in average yield for all seven of these varieties is

only from 3737 pounds per acre for Grimm to 4083 pounds for Ladak, the highest yielder for the trial period.

Table 7 gives the yields from the first harvest of the new alfalfa trial plots seeded in the 1964 season. The average yield of all varieties included in this trial was 3977 pounds per acre (oven-dry weight), with the range from a low of 2843 pounds for Lahontan to the high of 4687 pounds for Culver. Ladak was about at the mid-point of all varieties with a production of 4001 pounds per acre. On the basis of average yield for all varieties about 63 percent of the yield was produced from the first clipping and about 37 percent from the second clipping. Only Lahontan showed greater production from the second clipping than from the first, and here the distribution of yield between clipping periods was about equal. In the case of Culver, the highest yielding variety, 73 percent of the total yield was produced from the first clipping.

The data of table 7 show that there was an appreciable production of weeds from most plots. However, most of the plot stands are very good, and for most varieties all four replications can be considered as being in satisfactory condition. However, Du Puits and Lahontan show some weakness of stands, and with each of these varieties only 3 of the 4 plots seeded were harvested in the 1966 season.

Table 5. Yields of Alfalfa and Weeds in 1965 Season from Dryland Alfalfa Plots Seeded in 1960.

Variety	Dry Weight-Yield-Lbs./Acre				Total Yield Lbs. Per Acre	
	1st Clipping		2nd Clipping			
	Alfalfa	Weeds	Alfalfa	Weeds	Alfalfa	Weeds
S. Dak. (H-2157)	4447	7	1580	4	6027	11
Ladak	4382	43	1506	6	5888	49
Rhizoma	4034	24	1758	7	2792	31
Teton	4107	0	1530	0	5637	0
Rambler	3987	109	1569	0	5556	109

Narrangansett	3634	98	1730	10	5364	108
Vernal	3468	82	1684	33	5152	115
Grimm	3157	180	1879	8	5036	188
Ranger	3169	71	1655	25	4824	96
Scandia[1]	3609	140	1656	25	5265	165
Pfister[1]	3141	392	1476	22	4617	414
Du Puits	No Stand					
Average	3740	104	1638	13	5378	117

[1]Yield data from only one plot. No stand left on other three plots.

Table 6. Hay Yields from Dryland Alfalfa Plots Seeded in 1960.

Variety	Dry-Weight Yield - Lbs./Acre					Average Yield Lbs./Acre
	1961	1962	1963	1964[1]	1965[1]	
Ladak	963	5851	4504	3207	5888	4083
Rambler	1124	5947	4439	2840	5556	3981
Vernal	1099	5545	4345	3051	5152	3838
S. Dak. (H-2157)	900	5008	4302	2910	6027	3829
Rhizoma	827	5923	4244	2165	5792	3790

Teton	841	4960	4480	2796	5637	3743
Grimm	1059	5354	4113	3124	5036	3737
Ranger	869	4842	4100	2750	4824	3477
Narrangansett	1023	3658	4469	2625	5364	3428
Scandia	907	5312	3793	2349	5265[2]	3525
Pfister (FD-180)	904	5093	3701	1267	4617[2]	3116
Du Puits	974	5789	3984	1091	---	2960[3]
Average	958	5274	4206	2515	5378	3626

[1]Yields for 1964 and 1965 do not include weeds.

[2]1965 yield data for Scandia and Pfister from one plot only. No stand left on other 3 plots of each.

[3]4-year average yield - 1961 - 1964. No stand in 1965.

Table 7. Hay Yields in 1965 Season From New Alfalfa Trial Seeded in 1964

Variety	Dry-Weight Yield - Pounds Per Acre				Total Yield Lbs./Acre	
	1st Clipping		2nd Clipping			
	Alfalfa	Weeds	Alfalfa	Weeds	Alfalfa	Weeds
Culver	3416	42	1271	115	4687	157
Vernal	2869	100	1666	71	4535	171

Teton	2962	61	1510	26	4472	87
Ranger	2802	115	1622	81	4424	196
Warrior	2606	135	1490	61	4096	196
Norseman	2779	59	1308	149	4087	208
Ladak	2617	53	1384	76	4001	129
Travois	2390	62	1430	70	3820	132
Vinta	2392	103	1312	56	3704	159
Du Puits	1935	93	1615	56	3550	149
Cody	2106	57	1396	73	3502	130
Lahontan	1417	103	1426	95	2843	198
Average	2524	82	1453	77	3977	159

Back to 1965 Research Reports Table of Contents
Back to Research Reports
Back to Dickinson Research Extension Center (http://www.ag.ndsu.nodak.edu/dickinso/)
Email: drec@ndsuext.nodak.edu