

## NATIVE GRASSLAND INTERSEEDING

A native grassland interseeding trial was initiated in the autumn of 1969. Quantitative data were first taken at the end of the growing season in 1971. The experimental area is located immediately adjacent to the fertilizer trial at the Dickinson Experiment Station and is situated on a similar soil and vegetation type. Data with regard to water use efficiency, soil nitrogen, and yields are similarly obtained as in the fertilization trial. The objective of the trial is to apply a mechanical treatment to improve the condition of the native grassland in place of the fertilizer applications. Species of grasses and legumes were seeded into the existing native prairie to observe the influence of these introduced species on the production, quality and improvement of the grassland.

The trial includes five species of grasses, three species of alfalfa, one species of Sainfoin, and one species of Crown vetch, interseeded in 40-inch rows on 50 x 150 ft. plots. The species interseeded included: western wheatgrass (*Agropyron smithii*), green needlegrass (*Stipa viridula*), crested wheatgrass (*Agropyron cristatum*), Russian wildrye (*Elymus junceus*), smooth brome grass (*Bromus inermis*), Ladak, Ranger, and Travois alfalfa (*Medicago* sp.), Eski sainfoin (*Onobrychis* sp.), and Emerald crown vetch (*Viccia* sp.). In addition to the interseeded species, plots receiving no treatment (check plots), and plots with only a plowing treatment with no seeding were included.

No quantitative data were taken in the 1970 season in order to allow the establishment of the interseeded species. Germination and seedling establishment were generally high early in the spring of 1970; however, a short period of rather high temperature inflicted a high loss of seedlings by mainly the grass species. The alfalfa seedlings became well established and were apparently not greatly affected by the high temperatures. At the present time, only three species of grass, green needlegrass, crested wheatgrass, and smooth brome grass, were established well enough to warrant serious study. Data, however, were also taken from check plots and plowed plots with no seeding treatment.

Table 1 shows the yield data by different components and treatments for the 1971 season. The interseeded grass species did not appreciably contribute to the yield of the grassland in general. The greatest yields were observed on plots plowed with no interseeded species. The reduction in cover of the shortgrasses in this treatment allowed a rapid invasion by the western wheatgrass which increased the yield more than any of the interseeded grass species. In addition to the already mentioned observations, a release of nitrogen from the decaying sod, coupled with better water relations due to the furrowing effect of the plowing, resulted in this treatment showing the better results. Perennial forbs, especially fringed sage, increased rapidly on all plots and treatments of the trial.

The interseeding of Vernal and Ladak alfalfa resulted in an appreciable increase in yield over that observed in the check plots. Vernal alfalfa showed the highest increase in yield at 2552 lbs. / acre for a 439 lbs. / acre increase over check plots, followed closely by Ladak alfalfa at 2434 for a 321 lbs. / acre increase. The Travois alfalfa showed only a very slightly greater yield than was observed from the check plots.

**Table 1. Forage Production of Interseeded Grass and Legume Species and Native Grassland Species for the 1971 Growing Season**

Treatments	Dry Weight Yield - Pounds per Acre							
	Mid Grasses	Short Grasses	Perennial Forbs	Annual Forbs	Interseeded Species	Total Grasses	Total Forbs	Total Yield
Check – not plowed	948	911	250	4	-----	1859	254	2113
Check – plowed <sup>1/</sup>	966	567	588	19	100	1533	607	2240
Crested wheatgrass <sup>2/ 3/</sup>	791	757	231	45	68	1616	276	1892
Bromus inermis <sup>2/ 3/</sup>	1156	571	183	27	45	1772	210	1982
Green stipa <sup>3/</sup>	1097	642	361	38	20	1739	399	2138
Travois (alfalfa)	1066	462	341	50	208	1528	391	2127
Vernal (alfalfa)	1211	677	246	23	395	1888	269	2552
Ladak (alfalfa)	1242	508	394	44	246	1750	438	2434

<sup>1/</sup> Plowed but not seeded. Invaded species reported in interseeded species column.

<sup>2/</sup> Three replications only.

<sup>3/</sup> Entered with total grasses.

The magnitude of forage quantity and quality increase by the interseeding of grass and legume species does not appear great based on a single season's data. When compared with the forage yield increases experienced with the application of nitrogen, the increases are extremely nominal. Changes in the plant community brought about by interseeding of native or introduced species may, however, be rather great and more impressive over an extended period of observation. In general, the greatest value of interseeding may be expected in situations where the desirable native grassland species have been totally eliminated from the site and other restoration methods, such as nitrogen fertilization, are no longer feasible. More extended periods of observation will be necessary to adequately assess the benefits or disbenefits of this range improvement practice as it applies to native grassland in North Dakota.