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Vegetation Changes on the Waubun Prairie

Several plots, each with a different history of past disturbance, located in sections 27 and 33 of Popple Grove Township in Mahnomen County, were studied by the quadrat method during the summer of 1957. The plots that had once been cultivated and had been abandoned for varying lengths of time (2, 3, 5, and 6 years) were compared to two plots that had never been plowed; one of these had been mowed regularly, including the year 1956, and one was unmowed.

Fifty quadrats of one-half square meter size were placed at random in each area. The percentage of ground covered by each species in each quadrat was estimated as well as the percentage of bare ground and grass litter coverage. This report is concerned with the general changes that occur in the total ground cover and with some of the more specific changes in the grass cover.

Three broad categories were used for describing general ground cover: 1, annuals and weedy species; 2, prairie species; and 3, bare ground and dead grass litter. In areas abandoned for two years the percentage of ground covered by the annuals and weedy species was about 60 percent and decreased to about 10 percent after six years. In the mowed and unmowed plots these plants occupied less than one percent of the area. The prairie species, on the other hand, accounted for 10 percent to 17 percent of the areas abandoned for two years, increasing as high as 80 percent in areas abandoned for three or six years, only to decrease to 70 percent in the mowed and to 50 percent in the unmowed. These latter decreases result from the high percentage of ground covered by dead grass litter in unburned native prairie.

In recently abandoned fields bare ground may account for 20 percent of the area, but this decreases to practically zero in the native prairie.

The weedy grasses, mostly quack and redtop, occupied 50 percent of the ground in one area abandoned for two years, but only 10 percent in another area abandoned for two years, which did not have as long a past history of cultivation. There was a general decrease in these species to less than 1 percent in the native prairie. The prairie grasses accounted for less than 5 percent of the cover in recently abandoned fields increasing to 45 percent to 55 percent in fields abandoned for three to six years. In the mowed prairie the native grasses occupied slightly less than 50 percent of the area; in the unmowed only about 30 percent.

Switch grass (*Panicum virgatum* L.) is apparently a pioneer which reached its peak importance in three years and thereafter rapidly disappeared. Big blue stem (*Andropogon Gerardi* Vitman) and Indian grass (*Sorghastrum nutans* (L.) Nash) can also occupy 25 percent and 10 percent of the ground respectively in three years and each represents about 15 percent of the area abandoned for six years, both losing in percentage of ground cover in the native prairie. Needle grass (*Stipa spartea* Trin.) is slower to invade old fields but after five years it maintains an importance of 6 percent to 8 percent, the same as in the mowed and unmowed prairie. Little blue stem (*Andropogon scoparius* Michx.) was even slower to invade and in most areas was rather insignificant but it reached its peak and was more abundant than any other grass, 15 percent, in the native mowed prairie.

The total number of prairie species found in the fifty quadrats in each plot increased from thirty-six in one plot abandoned for two years to sixty-nine in the mowed prairie. Both the unmowed prairie and an area abandoned for six years had sixty-four species.