WHEAT PRODUCTION ON FALLOW,

SECOND CROPPING AND CONTINUOUS CROPPING

In 1976, an excellent year for small grain production on stubble land in southwestern North Dakota, yields on conventional summer fallow were 43 bushels per acre, on second cropping 27 bushels per acre and on continuous cropping 22 bushels per acre. In 1977, a year when hot, dry spring weather conditions were not particularly favorable to the germination and early growth of the crop, yields were appreciably reduced, even though rainfall in late May and June provided ample soil water for satisfactory crop growth. Yields on fallow were 26.9 bushels per acre, on second cropping 11.5 and on continuous cropping 5.5 bushels per acre. Relative differences between production methods were remarkably similar for both years.

In 1978, wheat on summer fallow averaged 38.5 bushels per acre in this trial compared with 31.4 on second cropping and 30.6 on continuous cropping. High yields on stubble land were a result of the excellent soil water recharge provided by the well above average precipitation coming in the fall of 1977 plus adequate seasonal moisture and cool growing season temperatures.

In 1978, fall precipitation was only 4.58 inches compared to more than 10 inches in 1977. In addition, a late spring planting date and a very dry period extending from April 20 to June 18 was unfavorable for good, uniform germination and early crop growth. The effectiveness of stored soil water in fallow under stressed conditions is readily evident in the harvested yields.

In 1980, severe drought conditions prevailed through the third week in June. Grain production was reduced on summer fallow and was zero on recrop and continuous cropping treatments.

In 1981 early seeded small grain crops were severely frosted by a severe freeze on May 9, but seemed to recover very well. The most severe weather affecting crop production occurred the first ten days in July when temperatures of 93˚F and above were recorded on 7 days, with a maximum reading of 110˚F. Evaporation measured 3.93 inches during this ten day period.

Precipitation during the last four months of 1981 was above average, providing a good soil water recharge. Snowfall was above average throughout the winter months, providing nearly three inches of precipitation from January thru March. Above average rainfall thru the growing season was well distributed.

The growing season of 1982 is best characterized as cool, wet and late.

Rainfall in September and October, 1982 was well above average, providing an excellent soil water recharge. Total fall precipitation for September through December, 1982 was 9.4 inches compared to the 90-year average of 3.16 inches. Precipitation of 4.9 inches during April through June was below average, but for the rest of the year, nearly normal. The combination of stored rainfall in September and October, 1982 and nearly normal seasonal precipitation provided ample water for good crop growth.

Mean temperatures for April, May and June were well below the 71-year average. Hot spells of several days in July and August when temperatures exceeded 90˚F affected late seeded grain, but early seeded crops escaped serious damage from high temperatures.

Yields in 1983 were the highest recorded in the 8-year trial period, with yields this year on recrop amounting to 85 percent of the yield on fallow. However, average production on recrop over the 8-year period amounts to only 62 percent of the yield on fallow. Trial data are summarized in Table 35.

A summary of wheat production in this trial is shown in Table 36.

Table 36. Wheat Production on Fallow, Recrop and Continuous Cropping

	Yield In Bushels Per Acre								
Treatment	**1976**	**1977**	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**	**8-Yr. Avg.**
Fallow	43.0	26.9	38.5	32.4	22.3	21.3	33.9	46.1	33.1
Recrop	27.0	11.5	31.4	15.9	0.0	14.5	25.7	39.0	20.6
Continuous Cropping	22.0	5.0	30.6	12.8	0.0	14.0	24.9	38.5	18.5