WHEAT PRODUCTION ON FALLOW, AND SECOND CROPPING

In 1976, an excellent year for small grain production on stubble land in southwestern North Dakota, yields on conventional summerfallow 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 summerfallow 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 condtions is readily evident in the harvested yields.

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

In 1981 early seeded small grain crops were severely frosted by a severe freeze on May 9th, 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 through March. Above average rainfall through 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 excelelnt soil water recharge. Total fall precipitation from 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 in 1983 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.

The fall of 1983 was drier than average with less than two and one-half inches of precipitation in the four month period September through December. Precipitation from January through March 1984 was also below average, and the dry period extended well into April, with the largest amount of precipitation during the month coming in the form of thirty inches of snowfall on the 27th. May was the driest in 93 years of record. Excellent distribution of five inches of rain in June was followed by a very dry July.

In 1985, the fall and winter precipitation was 1.12 inches below average. April precipitation was considerably lower than average. May rainfall of 4.31 inches was the most effective for crop growth. June rains were less than average but were well distributed. Cool temperatures in June, which included a freeze on the 12th, promoted excellent growth of small grain crops.

Fall precipitation during the last four months of 1985 was two inches above average and provided good residual soil water for fallow and recrop stubble. Above average precipitation was well distributed during the growing season except for the dry period starting May 25 and extending through June. While total precipitation for June was above average, 3.30 inches of that total fell during the last four days of the month. The growing season was generally cool with temperatures in April, May, July and August well below the 94 year average.

Total precipitation for the twelve month period, September, 1986 through August, 1987 was 21.19 inches which was slightly higher than for the preceding twelve month period. However, distribution of precipitation this year was much less favorable for crop growth than that of a year ago, resulting in considerably lower yields. Precipitation in April was only .17 inches, in May 1.87 inches and in June 2.32 inches, totaling 4.36 inches for the three month period. This was nearly 3.00 inches below normal. Coupled with below average precipitation was above average temperatures. Temperature for April was 7°F, for May 3°F and for June 5°F higher than the 94 year average.

High temperatures had a major effect on crops. From April through June the number of wheat growing degree days—the sum of daily degrees above 32—ranged from 500 to 700 more than normal across the state. This means that by July 1 the growing season for perennial plants and early-seeded crops was 14 to 17 days more advanced than usual. Above normal heat combined with a dry spell in April and May to reduce crop yields.

Table 40. Wheat Production on Fallow and Recrop

Year Treatment:	Yield (bushels per acre)	
	Fallow	Continuous Re-cropping
1976	43.0	22.0
1977	26.9	5.0
1978	38.5	30.6
1979	32.4	12.8
1980	22.3	0.0
1981	21.3	14.0
1982	33.9	24.9
1983	46.1	38.5
1984	34.5	27.2
1985	36.7	20.6
1986	57.8	30.6
1987	20.7	9.3
12 year average	34.5	19.6