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CROPPING SYSTEMS RESEARCH

This trial is designed to include a comparison of several crop rotation sequences as follows:

Treatment 1: Compares a two year rotation of wheat and corn with a two year fallow-wheat rotation. Early corn varieties for grain production will be used in this comparison.

Treatment 2: Compares a two year rotation of wheat and sunflowers with a two year fallow-wheat rotation.

Treatment 3: Records production in a four year cropping sequence of sunflower on wheat stubble, barley on sunflower stubble, fallow on barley stubble and wheat on fallow.

Treatment 4: Compares wheat on fallow, wheat on continuous cropping and wheat on no-till recrop.

In 1983 fertilizer was applied on all recrop, corn and sunflowers at the rate of 80 lbs. N, 30 lbs. P_2O_5 and no K_2O. All wheat on fallow received 40 lbs. N, 30 lbs. P_2O_5 and no K_2O. All land to be fallowed was not fertilized. In 1984 fertilizer was applied on all corn, sunflower and small grain recrop at the rate of 60 lbs. N, 30 lbs. P and no K_2O. All wheat on fallow received 30 lbs. N, 30 lbs. P and no K_2O. Land to be fallowed was not fertilized. In 1985, 60 lbs. of N and 30 lbs. of P were applied to all corn, sunflower, and small grain recrop. Fallow land was treated with 30 lbs. of N and 30 lbs. of P.

In both 1983 and 1984 weed control was accomplished with: Alachlor at 2 lbs./acre and Dicamba at .25 lbs./acre in a tank mix on corn; Trifluralin at .5 lbs./acre preplant incorporated on sunflower; and, Diclofop at .75 lbs./acre and Bromoxynil at .25 lbs./acre in a tank mix on small grain. In 1985, wheat and barley were sprayed with a tank mix of Hoelon at 2 pts./acre plus Buctril at 1 pt./acre. Weeds in sunflowers were controlled with .5 lbs./acre Trifluralin preplant incorporated.

Varieties used in the 1983 cropping systems trial were: Alex wheat, Morex barley, Keltgen 582 corn and Interstate 777S sunflower. In 1984 Alex wheat and Morex barley were used, along with Jacques JX21 corn and Interstate 7111 sunflower. Stoa wheat, Bowman barley, Jacques JX21 corn, and Interstate 7111 sunflower were seeded in 1985.

Tillage on fallow to prepare a seedbed was with a spring time cultivator and harrow. Continuous crop stubble, sunflower stubble, and corn stubble land were double disked in preparation for seeding, as was all wheat stubble planted to corn or sunflowers. Excellent yields were recorded for all crops in all rotation systems were the result of a combination of high fertility, ample reserve soil water, adequate seasonal precipitation, reasonably good growing conditions and satisfactory cropping management in 1983. Because of considerably drier growing conditions in 1984, yields were reduced with small grains showing the most reduction on all treatments. May 1985 rainfall was well above average. Cool temperatures in June slowed development of row crops but promoted excellent growth of small grains.

Table 41. Cropping systems trial - 1983-85

Crop & Rotation	Yield				% of fallow
	1983	1984	1985	Avg.	
Wheat yield on:					
Fallow	47.1	34.5	36.7	39.4	100
Continuous cropping	38.5	27.2	20.6	28.8	73
No-till recrop	39.0	20.4	14.8	24.7	63
Sunflower	46.1	21.4	16.9	28.1	71
Corn stubble	47.2	32.2	29.6	36.3	92
Barley yields on:					
Sunflower stubble	64.8	36.3	31.5	44.2	

Corn yields on:					
Wheat stubble					
Grain bushels per acre	72.6	72.4	56.5	67.2	
Silage tons per acre	10.3	8.9	12.6	10.6	
Sunflower on:					
Wheat stubble Lbs./acre	1784	1664	1224	1557	

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