

## 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<sub>2</sub>O<sub>5</sub> and no K<sub>2</sub>O. All wheat on fallow received 40 lbs. N, 30 lbs. P<sub>2</sub>O<sub>5</sub> and no K<sub>2</sub>O. 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<sub>2</sub>O. All wheat on fallow received 30 lbs N, 30 lbs. P and no K<sub>2</sub>O. Land to be fallowed was not fertilized.

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.

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.

Tillage on fallow to prepare a seedbed was with a spring tine 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 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.

**Table 37. Cropping Systems Trial – 1983-84**

| <b>Crop &amp; Rotation</b> | <b>Yield</b> |             |             | <b>% of Fallow</b> |
|----------------------------|--------------|-------------|-------------|--------------------|
|                            | <b>1983</b>  | <b>1984</b> | <b>Avg.</b> |                    |
| <b>Wheat Yields on:</b>    |              |             |             |                    |
| Fallow                     | 47.1         | 34.5        | 40.8        | 100                |
| Continuous cropping        | 38.5         | 27.2        | 33.0        | 80                 |
| No till recrop             | 39.0         | 20.4        | 29.7        | 73                 |
| Sunflower stubble          | 46.1         | 21.4        | 33.8        | 83                 |
| Corn stubble               | 47.2         | 32.2        | 39.7        | 97                 |
| <b>Barley Yields on:</b>   |              |             |             |                    |
| Sunflower stubble          | 64.8         | 36.3        | 50.6        |                    |
| <b>Corn Yields on:</b>     |              |             |             |                    |
| <b>Wheat Stubble</b>       |              |             |             |                    |
| Grain bushels per acre     | 72.6         | 72.4        | 72.5        |                    |
| Silage tons per acre       | 10.3         | 8.9         | 9.6         |                    |
| <b>Sunflower on:</b>       |              |             |             |                    |
| <b>Wheat Stubble</b>       |              |             |             |                    |
| <b>Lbs. / Acre</b>         | 1784         | 1664        | 1724        |                    |

**Table 38. Hard Red Winter Wheat Seeding Trial  
No Till and Hoe Drill, 1984**

|           | <b>Avg. Yield Bu. / Acre</b> | <b>Test Weight</b> |
|-----------|------------------------------|--------------------|
| No Till   | 32.3                         | 54.5               |
| Hoe Drill | 34.8                         | 54.0               |

LSD @ 5% - 11.0 bpa

CV = 13.1%