

## Report of 1998 Research

### CORN PERFORMANCE IN NARROW ROWS

This project was started in 1997 with funds from the Corn Marketing Board of Michigan. The 1998 narrow row trials were expanded with an additional location in Calhoun County. This new location had both an irrigated and non-irrigated comparison.

The trials were separated into two zones with three locations each for the 1998-growing season. The Southern zone contained Monroe County and the two Calhoun County comparisons. The Central zone contained trials in Ingham, Saginaw, and Huron Counties. Huron County was not harvested due to poor, uneven stands though out the field.

For the purpose of better matching the hybrids to each location, six hybrids with different traits and maturities were chosen. Of these six hybrids, we selected four for each maturity zone. The two earliest hybrids were used in the Central zone along with the two medium maturity hybrids. The same two medium maturity hybrids were then used in the Southern zone along with the two later maturing hybrids.

The hybrids used are listed below:

<u>Company</u>	<u>Hybrid</u>	<u>Maturity</u>	<u>Ear type</u>	<u>Height</u>	<u>Zone</u>
NOVARTIS	Max 86	93 day	Determinate	Tall	Central
Renk	RK 552	95 day	Indeterminate	Medium	Central
Great Lakes	GL 4758	100 day	Flex	Med-tall	Southern-Central
Pioneer	3573	103 day	Flex	Med-short	Southern-Central
Great Lakes	GL 5715	105 day	Determinate	Medium	Southern
Renk	RK 775	108 day	Indeterminate	Tall	Southern

Each trial utilized four hybrids at three row spacings of 30-, 22-, and 15-inch rows along with five plant populations replicated four times. Target populations of 26,000, 30,000, 34,000, 38,000, and 42,000 were not reached but uniform populations were obtained in the range of 20 to 34 thousand plants per acre.

All plots were planted and harvested in a timely manner, the following table lists the planting date and harvest date of each location:

<u>Location</u>	<u>Planting Date</u>	<u>Harvest Date</u>
Ingham	April 30 <sup>th</sup>	October 3 <sup>rd</sup>
Saginaw	April 29 <sup>th</sup>	September 29 <sup>th</sup>
Calhoun	May 11 <sup>th</sup>	October 26 <sup>th</sup>
Monroe	May 13 <sup>th</sup>	October 29 <sup>th</sup>
Huron	May 14 <sup>th</sup>	Not Harvested

## **Results**

This report details the data from the 1998 season. In 1999, this research project will continue with a summary of three years of results at that time. The following is a review of the results from the 1998 trials.

### **Ingham County: Table 1 A-F**

The Ingham County trials had lower than expected yields this season. The reductions in yields were due to lower than average precipitation throughout the growing season. The warmer than normal temperatures accounted for the higher test weights and lower harvest moisture. No hybrid showed any significant differences in yield to row spacing when averaged over populations. Yields of all four hybrids did show significant increases to higher population when averaged over row spacing.

### **Saginaw County: Table 2 A-F**

Saginaw County was affected by drought conditions soon after planting. The dryer than normal conditions affected the emergence of the hybrids. Timely rainfall at tasseling resulted in better than expected yields at the Saginaw site. Three of the four hybrids showed significant difference in yields between row spacings when averaged over population. Two of the four hybrids had significant yield increases as population increase to 30,700. The remaining two hybrids only showed a significant decrease in the yield at the lower populations when averaged over row spacing.

### **Calhoun County Irrigated: Table 3 A-F**

Seed-bed conditions were not favorable for our planter setup, resulting in uneven seed placement and emergence at the Calhoun County sites. The poor emergence caused a reduction in targeted populations. Two of the four hybrids showed a significant yield increase for both 15- and 22-inch rows over 30-inch rows when averaged over populations. All four hybrids displayed a significant yield increase as the population increased when averaged over row spacings.

### **Calhoun County Non-irrigated: Table 4 A-F**

As expected in a dry year, yields in the non-irrigated trial were much lower than that of the irrigated trial. Results also varied from the irrigated trial as one hybrid showed significant yield decrease in 15-inch compared to 30-inch rows and only one hybrid (a different one from the two in the irrigated trial) showed a significant increase for 22- over 30-inch rows. In population comparison, a significant increase in yields only occurred through the 2<sup>nd</sup> and 3<sup>rd</sup> population level.

### Monroe: Table 5 A-F

A damp, coarse seed-bed at planting time accounted for poor emergence causing a severe drop in population. Because of the lower range in population, Monroe County showed significant yield increases as populations increased. Populations were optimum for 30-inch rows and were not high enough for optimal yield potential in narrow rows. Two hybrids showed a significant yield increase for 15- over 30-inch rows and one each for 22- over 30- and 15- over 22-inch rows when row spacings were averaged over population. All hybrids exhibited significant yield increases as population increased.

### Summary

The following table shows the number of times by location that row spacing had a significant increase in the yield over another row spacing:

<u>Row spacing</u>	<u>Monroe</u>	<u>Calhoun-NI</u>	<u>Calhoun-I</u>	<u>Saginaw</u>	<u>Ingham</u>
15 over 30	6	2	10	8	3
15 over 22	8	1	0	7	1
22 over 30	4	1	7	1	1
22 over 15	2	4	0	0	1
30 over 15	3	2	0	0	0
30 over 22	3	0	0	4	0

In 20 comparisons (four hybrids by 5 locations), the highest single yield recorded for an individual hybrid occurred 11 times for 15-inch rows, 6 times for 22 inch rows, and 3 times for 30 inch rows.

### Date of Planting: Table 6 A-D

The planting date study was set up to investigate if a disadvantage existed for narrow rows in late season plantings. In 1997, our trials were planted late in the season and did not show significant yield advantages in narrow rows. Numerous MSU Extension trials (planted earlier in the season) conducted by local farmers did show yield advantages in narrow rows.

In the study conducted at Michigan State University, three planting dates were used: early, mid, and a late season. A set of three hybrids was selected so that one hybrid out of the three would best fit the maturity for each planting date. There was a two-week delay between planting dates. The three hybrids were planted in 30-, 22-, and 15-inch row spacings at populations targeted for 26-, 32-, and 38-thousand plants per acre.

The following table lists hybrids used in the date of planting study and their plant characteristics:

<u>Company</u>	<u>Hybrid</u>	<u>Maturity</u>	<u>Ear type</u>	<u>Height</u>
Novartis	Max	93 day	Determinate	Tall
DeKalb	DK 493	99 day	Indeterminate	Medium
Pioneer	PIO 3491	107 day	Flex	Short

The following table lists the planting and harvesting date for each trial:

<u>Location</u>	<u>Planting Date</u>	<u>Harvest Date</u>
Date 1	April 25 <sup>th</sup>	October 4 <sup>th</sup>
Date 2	May 9 <sup>th</sup>	October 11 <sup>th</sup>
Date 3	May 23 <sup>rd</sup>	
Max 86		October 19 <sup>th</sup>
DK 493		October 19 <sup>th</sup>
PIO 3491		October 23 <sup>rd</sup>

## **Results**

The data from this report is from trials conducted in 1998 only. Data from at least two growing seasons is needed to draw sound conclusions. This research will be continued in 1999 and a two-year summary will be published at that time. The following is a review of the results from the 1998 trials.