

Evaluation of Row Widths and Planting Populations for Field Corn

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Objectives

To evaluate yield response of field corn to three different row widths at two different planting populations.

Background

Soil Type:	Hoytville silty clay loam, Haskins loam,	Herbicide:	
Drainage:	Tile- nonsystematic	PRE (May 10):	2.4 oz/A Balance Pro + 10 oz/A Define SC + 2 qt/A
Previous Crop:	Wheat		Atrazine 4L
Tillage:	Fall disk/ripper; Spring field cultivate(2x)	Insecticide:	None applied
Soil Test(2005):	pH 6.5, P 47 ppm, K 126 ppm	Hybrid:	Seed Consultants SC1055
Fertilizer:	200 lb nitrogen/A surface applied as 28% UAN, plus 250 lb/A 6-26-30 surface broadcast, both incorporated	Row Width:	variable- see methods
		Planting Rate:	variable- see methods
		Planting Date:	May 9, 2005
		Harvest Date:	October 17-18, 2005

Methods

This study was set up with six treatments consisting of three different row widths at two different planting populations replicated four times in a randomized complete block design. The treatments were:

- 1) 30 inch row width @ 30,000/acre
- 2) 15 inch row width @ 30,000/acre
- 3) Twin row spacing @ 30,000/acre
- 4) 30 inch row width @ 40,000/acre
- 5) 15 inch row width @ 40,000/acre
- 6) Twin row spacing @ 40,000/acre

Twin row spacing plots consisted of two corn rows spaced 7.5 inches apart with a 22.5 inch gap between each set of twin rows. This spacing arrangement keeps the twin rows spaced at 30 inches on centers which allows the twin row planted corn to be harvested with a regular 30 inch corn head by squeezing the twin rows together as they enter the snapping rolls.

The twin row plots were planted using a Great Plains Precision Planter model 1525P that planted six sets of twin rows in a pass. Both 30 inch and 15 inch row width plots were planted using a John Deere 7000 Maxemerge six row planter equipped with a five row splitter attachment. The splitter attachment was engaged for planting 15 inch rows and disengaged when 30 rows were

planted. Each plot consisted of one round of the planter (12- 30 inch rows, 12- twin rows, 22- 15 inch rows). Plot length for all plots was 1,030 feet.

Early emergence (May 25) counts taken at V1, and harvest populations (October 12) were estimated by counting the number of plants on each side of a 17.5 foot section at three different locations in each plot. The average of the number of plants counted per 17.5 feet was converted to plants per acre. The 15 inch row plots were harvested with a special 11 row corn head set up for 15 inch row spacing. The 30 inch and twin row plots were harvested using a 6 row head set up for 30 inch spacing. The entire plot was harvested and yields were calculated based on weights measured by a calibrated weigh wagon and moisture readings taken by a hand held moisture meter. All yields are adjusted to 15% grain moisture.

Results

Table 1. Corn early emergence population, harvest population, moisture, and yield means¹.

Treatment ²	Early Emergence Population (plants/A)	Harvest Population (plants/A)	Moisture (%)	Yield (bu/A)
30 inch rows @ 30,000	30,600 c	29,500 c	15.0 a,b	202.5 a,b
15 inch rows @ 30,000	29,800 c	29,300 c	16.2 c	205.0 a
Twin rows @ 30,000	28,500 c	28,300 c	15.4 b	200.9 b
30 inch rows @ 40,000	41,800 a	39,900 a	14.8 a	191.2 d
15 inch rows @ 40,000	41,200 a	40,400 a	15.9 c	201.5 a,b
Twin rows @ 40,000	38,900 b	37,400 b	15.1 a,b	195.3 c
LSD (0.05)	1,340	1,890	0.36	3.9
F-test	190.1	82.5	20.9	15.8
CV (%)	2.5	3.7	1.6	1.3

¹Means followed by the same letter in same column are not significantly different

²15 and 30 inch row plots planted with a John Deere 7000 Maxemerge six row planter with a five row splitter attachment. Twin row plots planted with a Great Plains Precision Planter model 1525P

Summary

Results from this one year study indicate statistical differences between the treatments for all the parameters measured. Using two different planter units and variation in planter calibrations could explain the slight differences in populations. The difference in population among treatments is consistent in both the early emergence and harvest checks. Differences in moisture could be attributed partially to two different harvest dates with the 15 inch plots being harvested a day earlier than the other plots and having significantly higher moistures. The 15 inch plots were harvested a day earlier due to the special equipment needs of utilizing a 15 inch row corn head to harvest those plots. Other moisture differences do not correlate directly to row spacing or populations.

Yields were significantly higher at the lower planting population for both the 30 inch and twin row spacing plots, but not significantly different for the 15 inch rows. This supports the theory that corn can be over crowded and will end up competing between the plants for moisture, solar radiation, and soil nutrients.

Acknowledgement

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