



EVALUATION OF THREE ROW CONFIGURATIONS IN MIDSOUTHERN CORN PRODUCTION

Mid-Southern corn growers who have a desire to move to 30-inch or narrower rows to optimize grain yield potential need to know which corn products are best adapted to planting at a range of populations in narrow rows. Research demonstrates that the response of individual corn products to row width and plant population can vary. This 2012 study follows the research of previous years to answer questions on the effects of plant population and row configuration on corn yield potential.

STUDY GUIDELINES

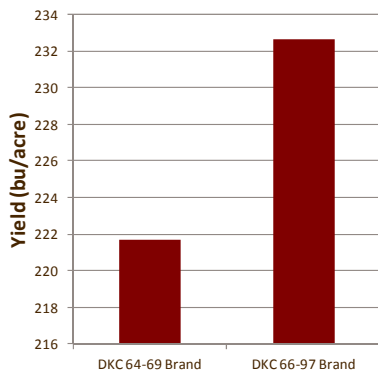
Testing was conducted at the Monsanto Learning Center at Scott, Mississippi in 2012 to evaluate the effects and interaction of plant population, row spacing, and germplasm on yield potential. Corn plots were planted in 30-inch single rows, 38-inch single rows and twin rows planted 7.5 inches apart on a 38-inch bed. To facilitate irrigation and field drainage, all rows were planted on beds. Planted populations were 33,000, 36,000 and 39,000 seeds per acre (seeds/acre). Standard agronomic practices for the area were implemented.

Two corn products were planted in each row configuration and at each plant population. The corn products selected were: DKC64-69 brand, a 114 relative maturity (RM) product with Genuity® VT Triple PRO® technology, and DKC66-97 brand, 116 RM with Genuity® VT Double PRO® technology. DKC64-69 brand has a medium-high plant height and medium-high ear placement and a large ear, while DKC66-97 brand has a shorter plant height and ear placement with a relatively small ear. Both products were harvested for yield and adjusted to 15.5 percent moisture.

RESULTS AND CONCLUSIONS

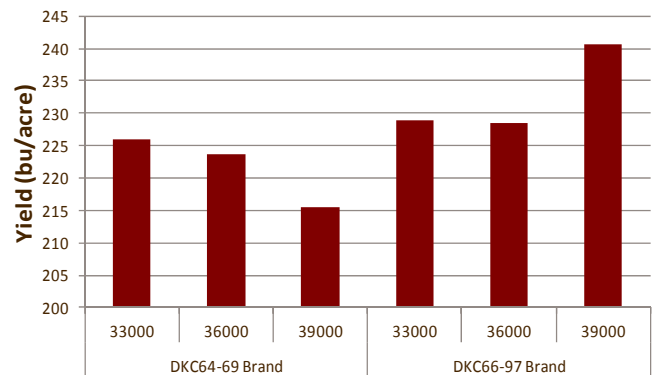
Averaged across all row widths and plant populations, DKC66-97 brand produced about 11 bu/acre higher yield than DKC64-69 brand (Figure 1). DKC64-69 brand did not respond to increasing

Figure 1. Average Yield Across all Row Widths and Plant Populations



populations while DKC66-97 brand demonstrated a positive yield response to higher populations. DKC66-97 brand in 30-inch single rows produced the highest average yield of 242.69 bu/acre (Figure 2). In most cases better adaptation of a corn product to one row

Figure 2. Average Brand and Population Effect on Yield Across all Row Widths



configuration or another was not observed.

Averaged across all row widths, DKC64-69 brand produced 225 bu/acre when planted at 33,000 seeds/acre 224 bu/acre when planted at 36,000 seeds/acre; and 215 bu/acre when planted at 39,000 seeds/acre. DKC66-97 brand produced 229 bu/acre when planted at 33,000 seeds/acre; 229 bu/acre when planted at 36,000 seeds/acre; and 241 bu/acre when planted at 39,000 seeds/acre (Figure 2).

Averaged across all plant populations, DKC64-69 brand produced average yields of 227 bu/acre in 30-inch rows; 232 bu/acre in 38-inch single rows and 206 bu/acre in 38-inch twin rows. DKC66-97 brand produced average yields of 243 bu/acre in 30-inch single rows; 227 bu/acre in 38-inch single rows, and 228 bu/acre in 38-inch twin rows (Figure 3).

The corn product that responds with a higher yield in a specific row configuration generally also responds with a higher yield in another row configuration, as long as the grower does what is necessary to optimize conditions for that row configuration (uniform seed spacing/placement, adequate bed preparation, clear middles to allow irrigation and drainage). This data indicates that growers should carefully consider both plant population and row configuration when making corn seed selections.



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PLANT POPULATION OBSERVATIONS

As noted in Figure 4, at 36,000 to 38,000 seeds/acre, the plant-to-plant spacing in 30-inch rows is more than 25 percent greater than in 38-inch single rows. This allows for better light, nutrient, and water interception, with less early plant-to-plant competition, and can increase yield potential if bed and row middle preparation allow for proper drainage. The data from this trial indicated that growers can increase yield potential with narrow rows and higher plant populations if they choose a corn product that is proven to respond to higher plant populations.

PLANTING CONFIGURATION OBSERVATIONS

When 36,000 seeds/acre are properly spaced and planted in 38-inch twin rows, lines drawn between plants on alternating rows form an isosceles triangle (Figure 5). The "triangle" in twin rows becomes equilateral at 38,117 seeds/acre. This is in the population range where maximum yields at the Scott Learning Center generally occur. This serves as a visible endorsement for maximum uniformity in plant spacing, whether seeds are planted in single or twin rows. Keys to achieving maximum uniformity include: properly adjusted twin-row planters, narrow row spacing, e-set units, proper planting speed, talc at planting and other considerations. Uniform plant spacing can be achieved down the row with proper

placement and across the field in single rows, various twin row configurations and in 30-inch single rows with each system having varying levels of inherent uniformity and the ability to influence uniformity via proper equipment adjustment and operation.

Figure 3. Average Brand and Row Width Effect on Yield Across All Populations

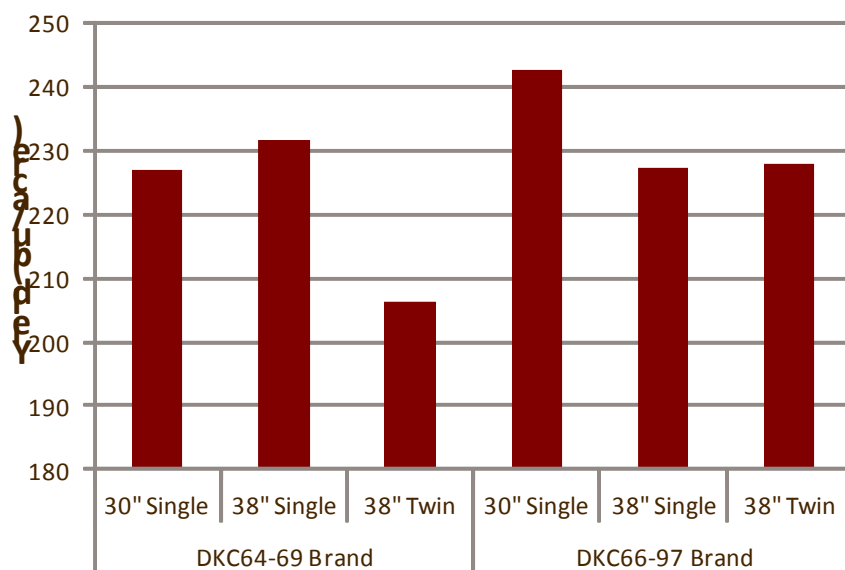


Figure 4. Plant to Plant Spacing in Various Row Configurations

Population	Row Spacing		
	30"	38" - Single	38" - Twin
28000	7.5	5.9	11.8
30000	7.0	5.5	11.0
32000	6.5	5.2	10.3
34000	6.1	4.9	9.7
36000	5.8	4.6	9.2
38000	5.5	4.3	8.7
40000	5.2	4.1	8.3



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ROW CONFIGURATION OBSERVATIONS

38-inch single rows

Positive

- Compatible with existing planting equipment
- Offers maximum drainage on most soil types
- Compatible with all row crops

Negative

- May not maximize yield potential of grain crops

38-inch twin rows

Positive

- Allows more uniform spacing of plants across the field and within the row
- Offers excellent yield potential in both corn and soybeans
- Allows single-row cotton production with minimal additional equipment issues
- Offers good drainage

Negative

- Requires a wide, flat bed to plant and establish maximum uniformity in corn
- May involve equipment issues such as stagger adjustment and reliability

30-inch single rows

Positive

- With equal drainage, this is probably the highest yielding system
- May help in maximizing yield potential in grains
- Compatible with corn, soybeans and cotton
- Allows use of one set of equipment for all crops

Negative

- Requires dedicated equipment
- Growers must make allowances to maximize drainage or the advantages brought by 30-inch rows will be negated by water issues and irrigation will be difficult
- Growers must establish a high bed and re-plow middles at layby to maximize drainage



Figure 5. Plant spacing for single and twin row plantings at 36,000 seeds/acre. Twin row planting is correctly staggered when lines between plants create an isosceles triangle.

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