



The Response of Corn Products to Row Configurations and Populations

Corn production has transitioned to narrower (30-inch) row widths in many Southern regions. The use of twin rows for corn production has gained popularity, especially in wide row (38-inch) raised bed systems which can help provide better drainage throughout the growing season. In response to continued grower requests, recently released corn products were planted in 30-inch single-row, 38-inch single-row, and 38-inch twin-row configurations at different planting populations. This demonstration evaluates the yield potential of these row configurations, corn product adoption to different production systems, and optimum planting populations for the different row configuration and corn product scenarios.

Study Guidelines

Four DEKALB® brand corn products (DKC62-09, DKC69-29, DKC66-40, and DKC67-57 brands) ranging from 112 to 119 day relative maturity were selected for this demonstration. Each product was planted in 30-inch single-row (SR), 38-inch SR, and 38-inch twin-row (TR) configurations at three populations (32,000, 36,000, and 40,000 plants per acre). The 30-inch SR plots were planted on March 7 and the TR plots were planted on March 8 in rows 7.5 inches apart on 38-inch beds. Standard agronomic practices for the area were implemented with irrigation provided as needed. Regionally appropriate fertility practices for corn were applied with a yield goal of 200 bushels per acre (bu/acre).

Results and Conclusions

Averaged across all corn products and planting populations, the 38-inch TR configuration out-yielded both the 38-inch SR and 30-inch SR configurations by 3.95 bu/acre and 22.55 bu/acre respectively. When averaged across corn products, yields for all three row configurations increased as planting population increased (Figure 1). When averaged across the three planting populations, all corn brands yielded more when planted in the 38-inch row configurations (Figure 2). DKC62-29 and DKC66-40 brands had the highest yield in 38-inch SR configuration and DKC62-40 and DKC67-57 brands had the highest yield in 38-inch TR configurations. Of the corn brands evaluated in this demonstration, DKC69-29 brand yield was least affected by row configuration and planting population. When averaged across row configurations most corn products increased yield as population increased (Figures 3 and 4). In 30-inch SR configuration most corn brands increased yield potential when populations increased (Figure 5). The corn brands responded the least to planting population in the 38-inch SR configuration (Figure 6).

When planting in 38-inch TR configuration DKC62-09 brand and DKC69-29 brand yields decreased when planted at the 40,000 seeds/acre population (Figure 7).

In general, for the products evaluated in this demonstration, DKC62-09 brand, DKC66-40 brand, and DKC67-57 brand have the best opportunity to benefit from higher planting populations. DKC69-29 brand did not increase yield potential beyond 36,000 seeds/acre. When planting at the different planting populations the highest yields were primarily seen in the 38-inch SR and TR configurations (Figures 8, 9 and 10).

Summary

Results from 2013 testing showed 38-inch TR and SR configurations out-yielded the 30-inch SR configuration. These results are similar to testing conducted in 2010 and 2011 where 38-inch TR out-yielded single rows (Figures 11 and 12)^{1,2,3}.

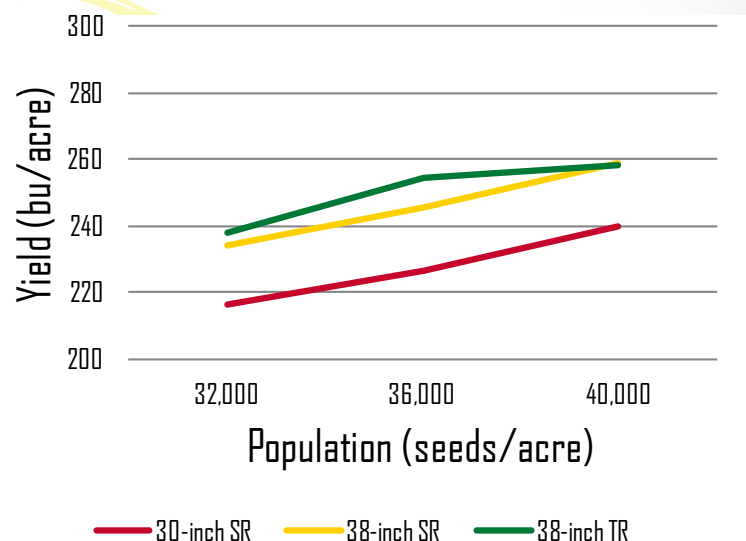


Figure 1. Effect of row configuration and planting population on corn yield averaged across four DEKALB® brand corn products in 2013.



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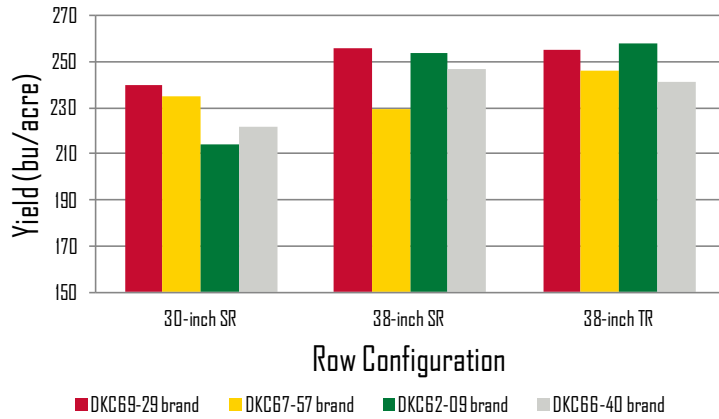


Figure 2. Effect of row configuration and DEKALB® brands on corn yield when averaged across three planting populations in 2013.

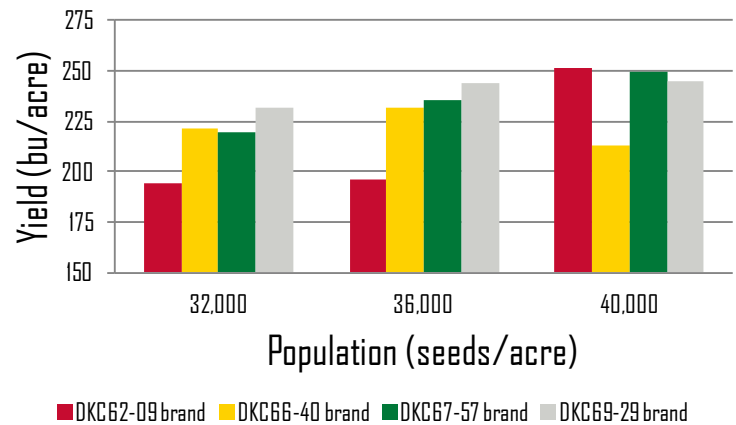


Figure 5. Effect of planting population and DEKALB® brands on corn yield when planted on 30-inch single rows in 2013.

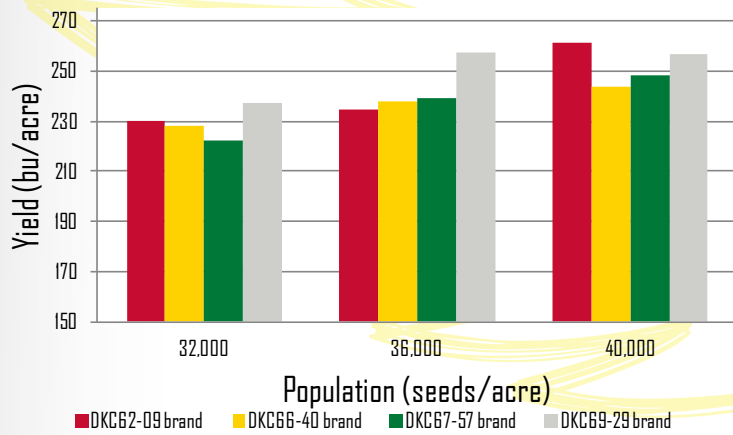


Figure 3. Effect of planting population and DEKALB® brands on corn yield when averaged across three row configurations in 2013.

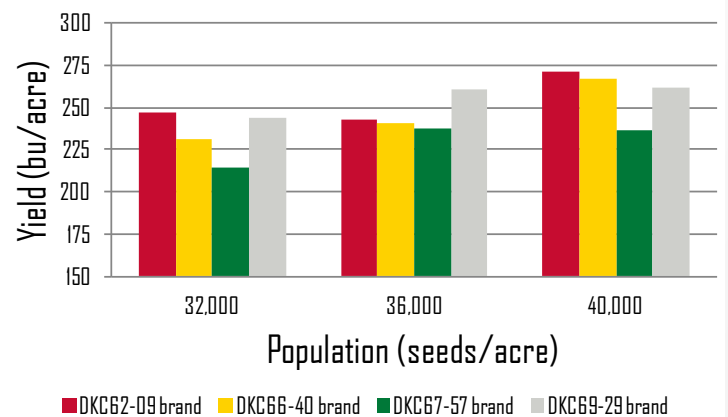


Figure 6. Effect of planting population and DEKALB® brands on corn yield when planted on 38-inch single rows in 2013.

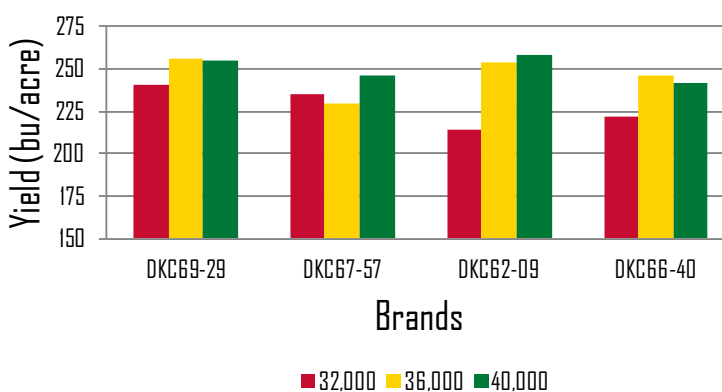


Figure 4. Effect of DEKALB® brand corn products and planting population on corn yield when averaged across three row configurations in 2013.

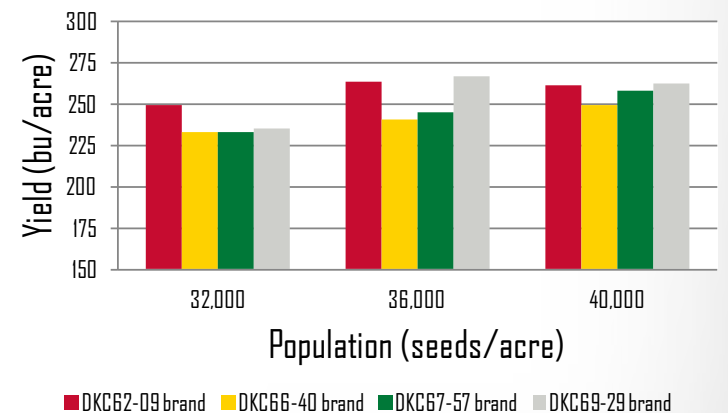


Figure 7. Effect of planting population and DEKALB® brands on corn yield when planted on 38-inch twin rows in 2013.



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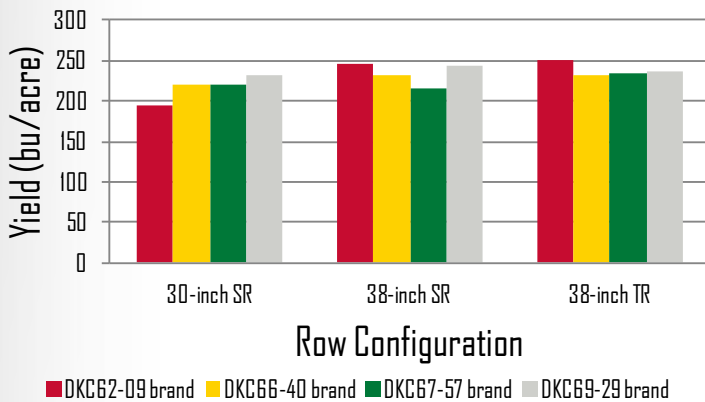


Figure 8. Effect of row configuration and DEKALB® brands on corn yield when planted at 32,000 seeds/acre in 2013.

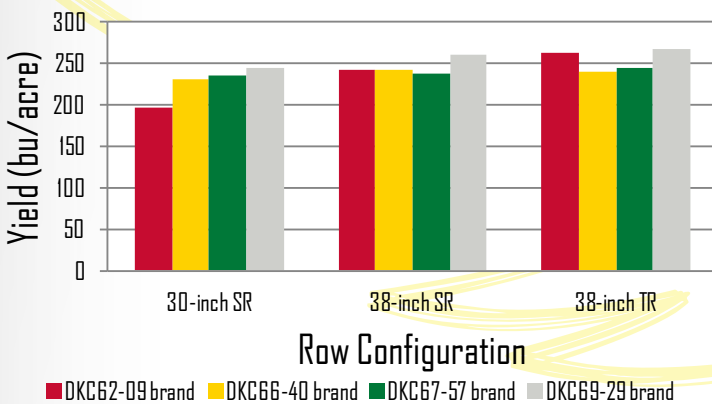


Figure 9. Effect of row configuration and DEKALB® brands on corn yield when planted at 36,000 seeds/acre in 2013.

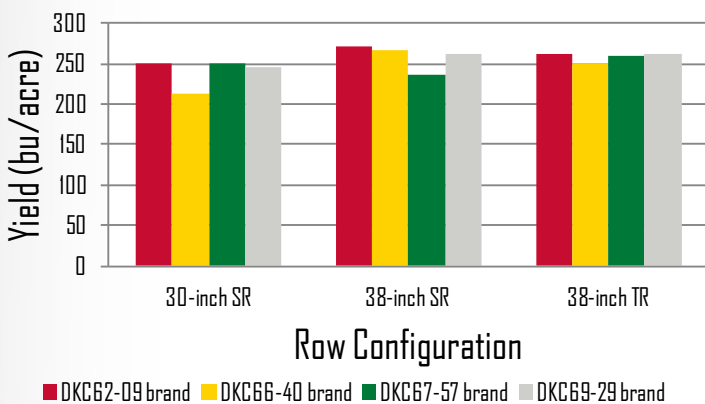


Figure 10. Effect of row configuration and DEKALB® brands on corn yield when planted at 40,000 seeds/acre in 2013.

In 2012, the 30-inch SR configuration out-yielded the 38-inch TR configuration (Figure 14).⁴ Changes in which configuration supports the highest yield may be due to environmental conditions. In 2013, wet early season conditions may have contributed to reduced yield potential in the 30-inch SR configuration due to reduce drainage when compared to the 38-inch row configurations. Examining multiple-year results can help to show how management and environmental factors can alter the yield potential of corn planted in different row configurations.

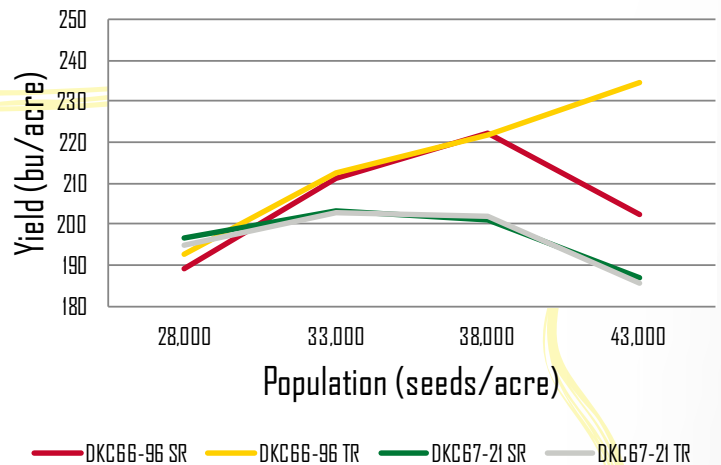


Figure 11. Yield results of different corn products and row configurations at different planting populations in 2010.

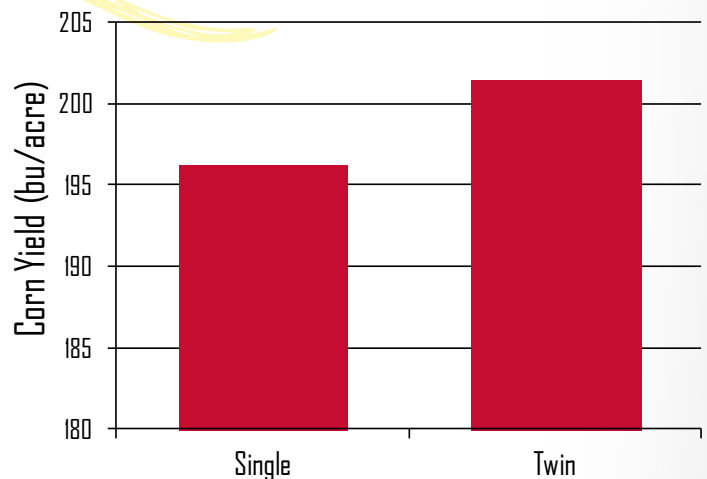


Figure 12. Yield results by row configurations when averaged across three corn products in 2011.



The Response of Corn Products to Row Configurations and Populations

With proper field preparation and management, both row spacing configurations can work well in Southern corn production systems. The 30-inch SR, 38-inch TR, and 38-inch SR configurations can offer many of the advantages of narrower rows, allowing for earlier and better light interception and utilization of water and nutrients through better plant distribution. These three configurations spread plant uniformity across the field, and twin rows can spread uniformity down the corn row as well.

Seedbed integrity and drainage can be a challenge with 30-inch SR, and should be given careful consideration in planning 30-inch production systems. Likewise, 38-inch raised bed preparation is critical with 38-inch TR and 38-inch SR, and planter adjustment is necessary for proper staggering of twin-rows. All of these factors should be considered when choosing a row configuration, when choosing products for planting, and when preparing or adjusting equipment for planting.

Overall, these demonstrations illustrate the importance of selecting products that consistently perform in an area. The response of a corn product to population is generally the same for all three row configurations. After selection, understanding how the individual products respond to different populations, row spacings, and configurations can help maximize corn yield potential.

Sources and Legals

¹ Corn response to population, row configuration, and soil type. Monsanto Learning Center 2011 Demonstration Report. ² Evaluation of new corn brands x population. Monsanto Learning Center 2011 Demonstration Report. ³ Cotton, corn and soybean row width and planting configuration comparison. Monsanto Learning Centers 2010 Demonstration Report. ⁴ Corn yield response to row spacing configuration and population. Monsanto Learning Center 2012 Demonstration Report.

The information discussed in this report is from a single site, two rep demonstration. This informational piece is designed to report the results of this demonstration and is not intended to infer any confirmed trends. Please use this information accordingly.

Individual results may vary, and performance may vary from location to location and from year to year. This result may not be an indicator of results you may obtain as local growing, soil and weather conditions may vary. Growers should evaluate data from multiple locations and years whenever possible.

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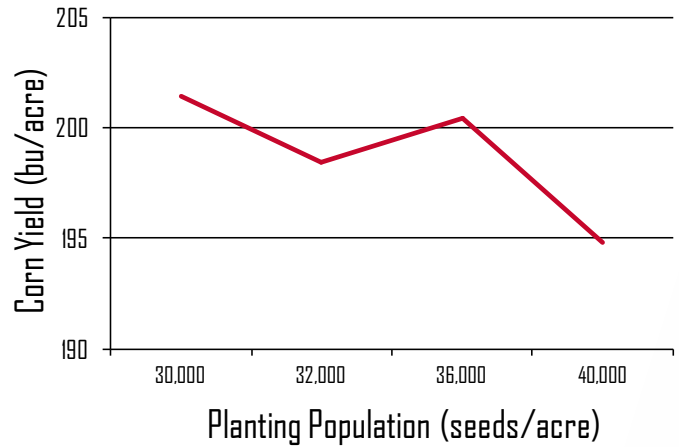


Figure 13. Yield results by planting population when averaged across three corn products in 2011.

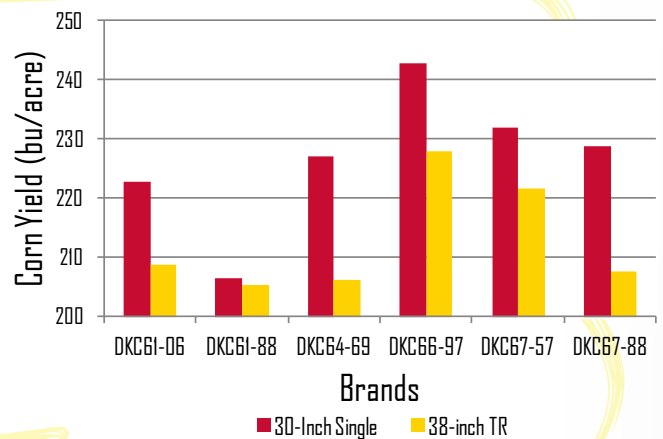


Figure 14. Effect of row configuration and DEKALB® brands on corn yield when averaged across three planting populations in 2012.

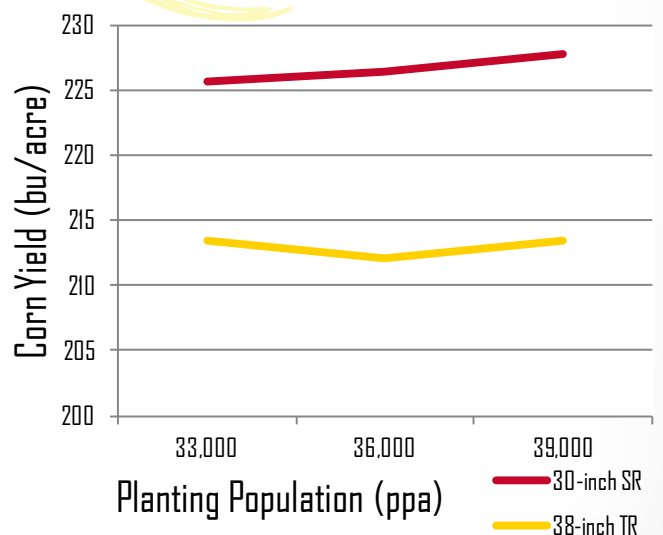


Figure 15. Effect of row configuration and planting population on corn yield averaged across six DEKALB® brands in 2012.