# Mississippi Corn Promotion Board
# 2012 Progress Report

**Project Title:** Evaluation of Irrigated Narrow, Wide, and Twin-Row Corn Production in Mississippi

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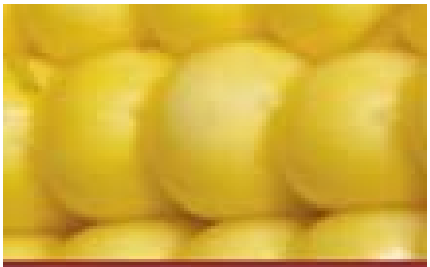
**Department:** Plant and Soil Sciences



## Project Summary (Issue/Response)

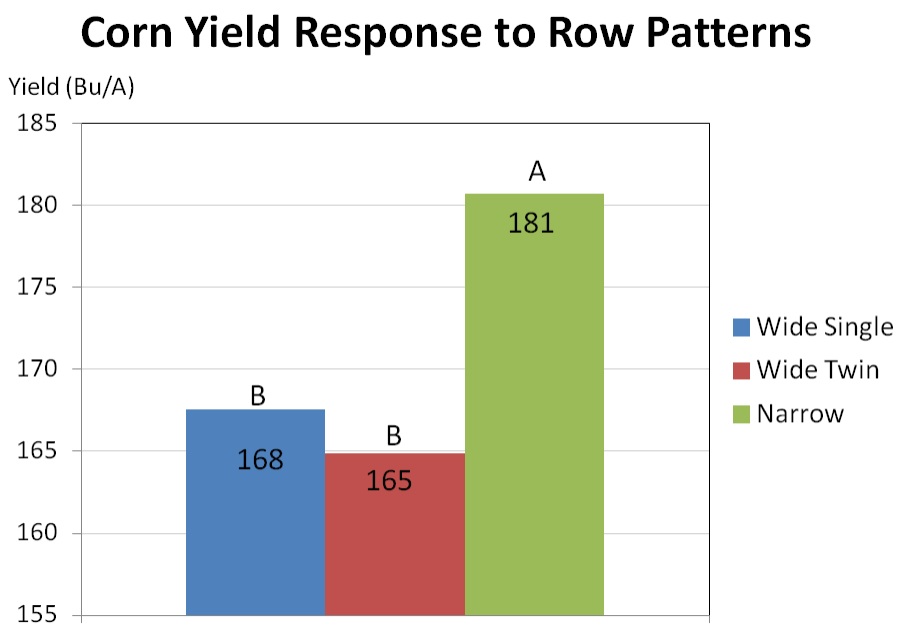
Row crop planting systems in the Mid-South have historically been dictated by cotton production. However, Mississippi and other states in the Mid-South region have experienced a dramatic shift in row crop acreage since 2007. Cotton acreage has dropped to only 39% of its long-term acreage, while corn and soybean acreage now comprise more than 83% of Mississippi's crop acreage. Because many growers no longer grow cotton, they are more open to adapting their planting systems to optimize corn and soybean production. Research has shown reducing row width or planting twin-rows increase corn productivity and growers have successfully adopted and implemented these planting systems throughout the entire U.S. where cotton is not grown. A research project was funded by the Mississippi Corn Promotion Board and initiated in 2010 to determine corn performance response and issues associated with row patterns which improve corn spacing geometry in southern, irrigated cultural systems. Few, if any studies in the Mid-South region have compared wide row systems (38 or 40" single or twin-rows) directly to narrow rows (30"), particularly in irrigated or high-yielding culture. Studies were conducted using raised-bed systems and irrigated cropping culture common to Mississippi and the Mid-South region.

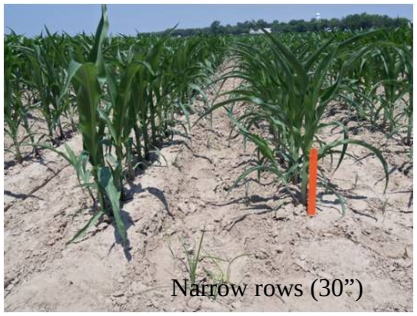
## Project Results/Outcomes

Irrigated field studies were conducted at Mississippi State University and the Delta Branch Research and Experiment Station at Stoneville. Three row patterns, wide single rows (38 or 40" row width), twin-rows (38 or 40" base row width) and narrow rows (30" row width) were evaluated with a range of hybrids and plant populations. A range of plant population from 25,000 to 40,000 plants per acre did not affect the degree of corn response to various row patterns. Likewise, four hybrids differing in various characteristics, such as ear flex, plant height, and canopy architecture, which may affect corn response to the treatment variables did not affect corn response. Studies did produce significant differences in corn grain yield in response to the various row patterns. The narrow row pattern (30" rows) produced yields 9% higher than traditional wide rows common in the Mid-South. This response is consistent with previous research from the Corn Belt and is likely due to more efficient utilization of resources (light, nutrients and water) due to improved plant spacing geometry associated with narrow rows. There was no significant yield difference between wide single rows and twin-rows on the same 38 or 40" base row width. Although twin-rows do improve plant geometry, realizing these advantages may be a challenge when implementing this row pattern on raised-bed systems, compared to where raised-beds are not commonly established in other growing regions. Planting twin-rows on raised-beds may contribute to uneven corn seedling emergence and root development issues related to plant alignment near the edge of a bed. Root development issues may be more pronounced with twin-rows and limit produc-

# Project Results

tivity more with corn, compared to those crops possessing a tap-root, because corn has a fibrous root system with considerable lateral growth.






# Project Impacts/Benefits

More Mississippi growers are considering alternative planting systems to optimize corn and soybean productivity, particularly if they are not growing cotton. This research shows reducing row width from traditional wide rows (38-40") to narrow rows (30") can increase corn grain productivity by 9%, which is consistent with past Corn Belt research. Twin-row planters are an alternative which would not require adjusting equipment from the traditional wide rows, but did not prove to be any more productive than single wide rows when grown the raised-bed systems common in Mississippi. Thus, implementation of narrow row corn planting systems appears to one of the most viable methods to increase corn productivity in the Mid-South. Further investigation may be helpful to refine systems to alleviate issues associated with water management in our high rainfall environment.

# Project Deliverables

**Professional Presentations:**

American Society of Agronomy, Crop Science Society of America, Soil Science Society of America International Annual Meetings, San Antonio, TX, 10/16-19/2011

ASA Southern Regional Branch Meetings, Birmingham, AL, 2/5-7/2012

Mississippi State University Row Crops Field Day, MSU, MS 7/19/2012

Mississippi State University Delta Research and Extension Center Row Crops Field Day, Stoneville, MS 7/19/2012

American Society of Agronomy, Crop Science Society of America, Soil Science Society of America International Annual Meetings, Cincinnati, OH, 10/21-24/2012.

**Educational Training**

Tyson Poulsen has conducted this research in conjunction with his training associated with pursuing a Master's degree at Mississippi State University

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