

Soybean Input Costs And Yields

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The David M. Barton Agricultural Research Center recently completed research involving yield potential through plant population variability with sub-surface irrigation in soybeans. This is the first research study to be completed at the new David M. Barton Agricultural Research Center. The Center is located 1.5 miles south of the Route K and Missouri Highway 25 junction and is comprised of 250 acres, 100 acres of which are dedicated to crop production research and contains a Sub-Surface Controlled Irrigation and Drainage Tile System. This design has a system of four inch slotted corrugated plastic tile having a parallel spacing of 30 Feet. Control boxes route the flow of irrigation/release according to whether the grower wishes to drain or irrigate the field. The system permits the drainage of the land in the spring to allow earlier entry for planting and then the system is switched from drainage to water holding. The tile is kept full of water by closing the drop boxes. The soybeans were Sub-Soil Irrigated until they reached the R6 stage of growth when the soybeans have reached full pod growth and beans touching in the pod. Southeast Missouri State University is thankful to NRCS for the design assistance, Cassy Landewee from MFA Chaffe, Missouri for crop scouting services, and USDA Rural Development for the grant. The system was installed by John Lorberg and family.

The purpose of the study was to determine the soybean yield in this type of irrigation associated with five different planting populations. The populations were 110, 125, 140, 155, and 170 thousand plants per acre. The full season, Great Heart 4380RR variety, soybeans were planted on May 20, 2008 with a no-till planter on 15 inch centers. The 33 acre plot was field cultivated very lightly one time to eliminate small weeds.

Cost of inputs for the study were collected and summarized on a per acre basis: Pre-plant soil preparation \$15.00, Pre-plant fertilization (46# P and 60# K and application) \$101.68, Planting \$12.00, Soybeans \$34.00 (140,000 seeds per

acre), First herbicide and application (2 quarts Round-up) \$21.50, Second herbicide and application (1.5 quarts Round-up and 0.25 Oz. Synchrony), Headline and application (6 Oz. Headline and 6.4 Oz. Asana) \$21.71, and Quilt plus application (20.5 Oz. Quilt) \$30.06. The Quilt application was needed because of the infestation of Cerco Spora Leaf Blight. Total input costs for the soybeans were \$255.27 per acre.

Harvest cost for the soybeans was \$55 per acre and include combine, hauling, and labor. The total cost of the soybean production per acre in this study was \$310.27. Thus, if the soybeans are sold at \$9.00 per bushel the return per acre profit of \$431.33 is realized.

Yield data was calculated for each of the populations as follows:

Population	Bushels/Acre
110,000	75.8
125,000	94.6
140,000	77.4
155,000	75.4
170,000	88.7
Overall Average	82.4

The yield results at a population of 125,000 is significantly different from the other populations at the (p>.10) level. Research from other regions support these findings, in that a population above 125,000 cannot be justified, economically, with full season soybeans. The increase in yield at the 170,000 population can only be explained by the increase in number of plants due to the population numbers. These data do not explain why the above explanation does not apply to all study populations. The additional population costs (\$8.50) of the 45,000 seed cannot be justified from these data. This research design will be further studied at the David M. Barton Agricultural Research Center.

If you have further questions please contact Dr. Ellis at 573-651-2797 or (wellis@semo.edu). Mention of trade names does not indicate endorsement or imply that their performance is superior to other similar products. Δ

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