

Cost Efficiency In Sub-Surface Irrigated Corn

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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 corn. This is the first corn 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

preparation \$30.00, Pre-plant fertilization (125 # Urea, 25# P, 125# K, 5 # Sulfur, 5 # Zinc) \$126.00, Planting \$12.00, Seed \$89.29 (29,000 average per acre), Pre-emergence chemicals & applications (1 Quart Atrazine, 1 Ounce Resolve) \$16.13, Post-emergence chemicals & applications (2.5 Quarts Round Up, 1¼ Resolve Q, Surfactant) \$40.02, Liquid Nitrogen & applications (125 pounds N per acre) \$84.70, Headline & Insecticide & application (6 Oz. Headline, 1.6 Oz. Warrior) \$20.35. Total input costs for the corn were \$418.49 per acre.

Harvest costs for the corn was \$68 per acre and include combine, hauling, and labor. The total cost of the corn production per acre in this study was \$486.49. Thus, if the corn is sold at



Dr. William Ellis, Professor/Department of Agriculture at Southeast Missouri State University, displays to his class how to open a drop box.

Photo by John LaRose, Jr.

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

\$4.00 per bushel the return per acre profit of \$417.11 is realized.

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

The Sub-Surface Controlled Irrigation and Drainage Tile System has a 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 permit 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.

drainage of the land in the spring to permit 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 corn was Sub-Soil Irrigated until it reached black line stage of growth. Southeast Missouri State University is thankful to NRCS for the design assistance, Cassy Landewee from MFA Chaffee, Missouri for crop scouting services, DuPont for crop chemicals, Pioneer for seed corn, and River Bend Agriculture for fertilization and USDA Rural Development for the grant. The Sub-Soil Irrigation system was installed by John Lorberg and family.

The purpose of the study was to determine the corn yield with Sub-Soil Controlled irrigation associated with five different planting populations. The planting populations were 25, 27, 29, 31, and 33 thousand seeds per acre. The Pioneer corn variety was 31P42 planted on April 29, 2008 with a no-till planter on 30 inch centers. The 41 acre plot was field cultivated deeply once and very lightly the second time to eliminate small weeds and level the land from the 15 inch rain the Research Center received in the spring of 2008.

Cost of inputs for the study were collected and summarized on a per acre basis: Pre-plant soil

Population	Bushels/Acre
25,000	228.6
27,000	227.4
29,000	224.7
31,000	217.4
33,000	231.6
Overall Average	225.9

The study found no significant differences in corn yields per acre from the planting populations studied.

The Department of Agriculture will continue to determine the corn planting population that is economical for the Sub-Soil Controlled Irrigation system. Population research will be further studied at the David M. Barton Agricultural Research Center in 2009. The anticipated 2009 study is population yields at 21, 23, 25, 33, and 35 thousand seeds per acre.

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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