Subsurface Drip Irrigated Installation for Evaluating Crop Row Direction and Lateral Offset Distance*

Description
Maintaining crop rows in subsurface drip irrigated (SDI) fields at the same relative locations to the drip laterals every year is difficult. In 2005 an elaborate SDI system was installed to determine the effects on cotton production of horizontal distance of crop rows from SDI laterals, as well as perpendicular orientation of crop rows to laterals at lateral spacings of 0.75, 1.0, and 1.5-m. Other factors included maximum irrigation capacities of 5 and 7.5 mm/d and crop row spacings of 0.75-m and 1.0-m.

Knowing crop response to SDI lateral positions and orientations could improve the effectiveness of rainfall and irrigation water use.

Research and Results
- Increasing crop row to SDI lateral offsets caused increased differences in cotton lint yield between pairs of rows irrigated by laterals installed in alternate furrows. Cotton yields from crop rows closest to the lateral largely compensated for reduced yield of rows farthest from the SDI lateral. But average yields of row pairs declined from 1755 kg/ha to 1616 kg/ha as offsets increased from 0 to 380 mm in 0.75-m crop rows.

- Cotton lint yield from rows planted perpendicular to drip laterals was greatly reduced by increasing lateral spacing from 1923 kg/ha at 0.75-m to 1762 kg/ha at 1.5-m when averaged across row spacing and irrigation capacity.

- There was no difference in average cotton yield between traditional (SDI in alternate furrow, row parallel to lateral, and zero offset) and perpendicular row to SDI lateral plantings with laterals spaced at 1.5 m (1755 kg/ha versus 1721 kg/ha).

*Content after “SDI Installation for Evaluating Crop Row Direction and Lateral Offset Distance” by James P. Bordovsky, Texas AgriLife Extension, Plainview TX, an American Society of Agricultural and Biological Engineers meeting presentation, June 2007, paper number 072193.

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