

**COTTON YIELD RESPONSE TO SPRINKLER  
IRRIGATION AND IN-ROW SUBSOILING**

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**Abstract**

Subsoiling at a 45° angle has been a recommended practice since the mid-70's on most Delta cotton soils. This practice has been shown to break up hard pans and allow deeper wetting of the soil profile with winter rainfall. Producers are now focusing their attention to in-row subsoiling, because new subsoiler designs have the shank extending through the soil at an angle, reducing soil surface disturbance and allowing the subsoiler to run in the row direction, without the shank passing directly through the drill. Irrigation acreage has also expanded since the early 80's, both with center pivot systems and with furrow systems, and will continue to expand with the occurrence of drought years. Irrigation is truly supplemental and represents a type of insurance against yield uncertainty during dryer-than-normal years, with our variable rainfall.

The objective of this study is to determine the effects of different levels of irrigation on non-subsoiled and in-row subsoiled treatments, on a field known to respond to both subsoiling and irrigation. This is a report on the first four years of a planned six-year study (1994-1997).

In-row subsoiling was performed with a low-till parabolic subsoiler. The irrigation levels included a non-irrigated check, a low-level and a high-level of irrigation. The low-level irrigation was initiated when the entire rooting depth was depleted of its easily available water as indicated by tensiometers. The high-level irrigation was initiated when the easily available water was depleted from the top 12 inches of the soil profile. Overhead sprinkler irrigation applications were in the amount of 0.75 or 1 inch.

In three of the four years, irrigation of non-subsoiled treatments increased lint yields over the non-irrigated, non-subsoiled check, and irrigation of subsoiled treatments increased lint yields over the check. The high-level irrigation treatment decreased yields the other year. These preliminary results indicate that if environmental conditions are inadequate for in-row subsoiling that lint yields can be maintained with either the high-level or the low-level irrigation regime used in this study. Irrigation of subsoiled treatments was more variable (two years no difference, one year increased yields, and one year decreased yields) as compared to the non-irrigated, subsoiled treatments.