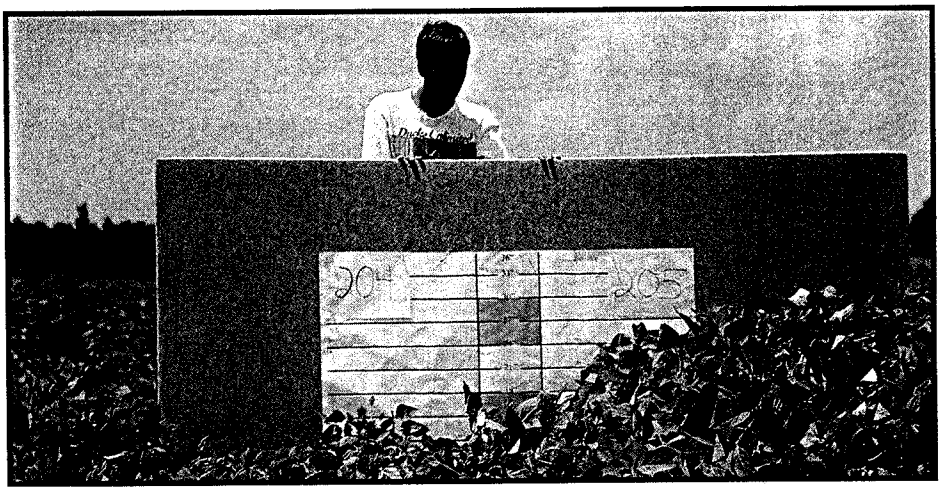
SUBSURFACE DRIP IRRIGATION PART II

SDI in in the Southeast

by Carl R. Camp

In areas with significant rainfall, such as the southeastern U. S., irrigation is often not needed on a regular basis. On the other hand, it is needed during drought periods, which can occur several times during a growing season. Droughts can be intense because sandy soils do not store much water and compacted soil layers can restrict rooting depth, which further restricts water availability. Irrigation can be difficult in these areas because fields often have irregular boundaries and are small compared to the western U. S. Given these conditions, which irrigation system is best? Subsurface drip offers several advantages.



Narrow-row soybean: rainfall only on left and narrow spacing (38") subsurface drip on right.

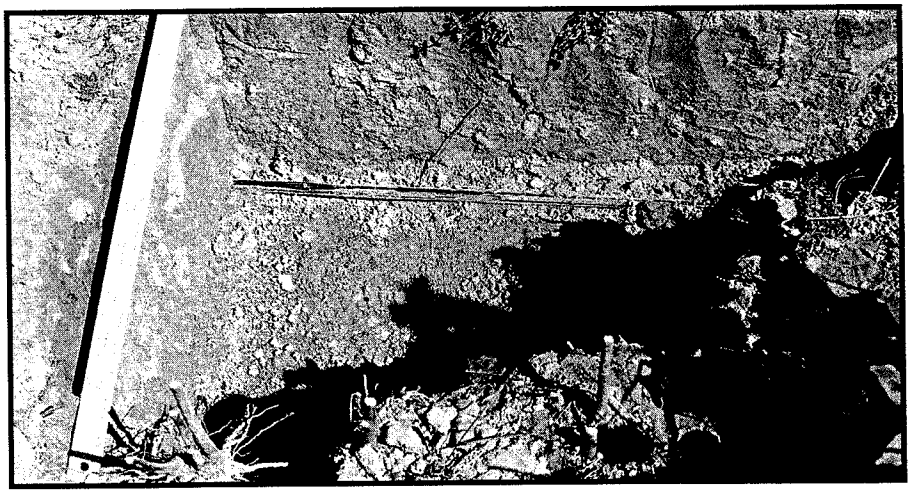
The general advantages of subsurface drip are frequent and precise applications, flexible nutrient management, and low labor requirement. In addition, it can be adapted to most any field size and shape and can utilize several, low-capacity water supplies distributed throughout the system. Perhaps the greatest advantage is that the system can be automated and started easily between periods of rainfall.

During the past few years, interest in subsurface drip irrigation in most southeastern states has increased dramatically. Many farmers are installing small (10-20 acres), trial systems and extension personnel in several states have installed trial systems to evaluate subsurface drip for local conditions. Most are interested in irrigating cotton, but there is also interest in several other crops, such as vegetables and melons.

Fourteen years of research at Florence, SC, has shown that subsurface drip is an effective method even when laterals are spaced up to six feet apart in alternate crop inter-rows. In these studies, tubing was installed 12 " deep. For cotton, no difference was found for 38" and 72" spacings in seven years of trials. Corn yield was reduced only 10% in one of six years for the 60" spacing compared to a 30" spacing. This risk may be acceptable in view of a 30% lower cost with the wider spacing.

When considering subsurface drip in the Southeast, all capabilities of this irrigation method should be used to maximize system efficiency. Systems should be designed to allow frequent irrigation and nutrient applications with automated or remote operation. The system should also be designed by a competent irrigation designer because of special requirements, including filtration, air entry, chemical injection, and flushing manifolds. In high-rainfall areas with very wet soil conditions, permanent traffic lanes between laterals may prevent damage to tubing caused by wheels of heavy machinery during harvest operations. The drip tubing should be deep enough (at least 12 inches) to prevent damage from tillage equipment.

Subsurface drip can effectively provide water and nutrients for many crops, even in areas with high seasonal rainfall. Crop yield response to irrigation will depend on the crop and efficacy of these systems will vary from site to site and from year to year. Design and management criteria for subsurface drip systems in these areas are still being refined.



Subsurface drip lateral in cotton about 12" deep (USDA-ARS, Florence, SC).

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