

IRRIGATION - (*Harrison and Raymer*)

Dryland soybean yields in Georgia range from about 5 to 50 bushels per acre. Extended drought during the "critical fruiting period" is the major reason for this yield variation. Timely irrigations can stabilize soybean yields at 45 to 50 bushels per acre and improve average yields about 20 bushels per acre.

Irrigation is expensive and requires careful management to be economically feasible for soybeans. This can usually be accomplished when (1) soybean market prices are good, (2) irrigation overhead costs can be shared with a winter-spring crop and (3) when irrigation for soybeans can be targeted for soybean "critical periods" in July, August and September.

The following water balance method is suggested for 45 to 50 bushel soybean yields:

1. If needed, apply 1.0 to 1.5 inches of water for stand establishment. (Application ahead of planting is preferred.)
2. Prior to first bloom, irrigate with 1.0 to 1.5 inches of water if wilting is observed by late afternoon.
3. From first bloom (R1) to beginning pod elongation (R4) irrigate with 1.0 to 1.5 inches of water if wilting is observed by midday.
4. From beginning pod fill (R5) to full-bean stage (R6) irrigate, using some means of irrigation scheduling, to keep soybeans from wilting. (See methods below.)
5. From full-bean stage (R6) to physiological maturity (R7) irrigate with 1.0 inch of water if wilting is observed by late afternoon.

Irrigation Scheduling Methods for Soybeans

To schedule irrigation for most efficient use of water and maximum production, it is essential to frequently determine the soil water conditions throughout the root zone of the crop being grown. A number of methods for doing this have been developed and used with varying degrees of success, but the two which have proven most practical for field use are tensiometers and electrical resistance blocks. In comparison to investment in irrigation equipment, these instruments are relatively inexpensive.

Tensiometers

A tensiometer is a sealed, water-filled tube with a porous ceramic tip on the lower end and a vacuum gauge on the upper end. The tube is installed in the soil with the ceramic tip placed at the desired root zone depth and with the gauge above ground.

Electrical Resistance Sensor

Electrical resistance meters determine soil moisture by measuring the electrical resistance between two wire grids embedded in a block of gypsum or similar material that is permanently embedded in the soil. They are best suited to heavy soils.

Solid State Blocks

Manufacturers have recently improved their technology to allow for blocks that perform in the range of tensiometers. These type blocks work very well in coarse type soils (sandy) in the soybean belt. An advantage of solid state blocks is they do not require refilling as does the tensiometer. The basic location and installation of the blocks are similar to the installation of the tensiometer except no water is required to be put into the block.

Keeping a Chart

You can obtain the full benefit of using tensiometers, electrical sensors or solid state blocks by recording readings and plotting them on a chart. Readings may be plotted