IRRIGATION

Cotton is an excellent candidate for irrigation. Irrigation is particularly important in areas that frequently have drought in July through August 20 and on sandy soils. Irrigation may increase yields from a range of 0 to more than 800 lb/A, with increases of 200 to 400 lb/A common. The most critical period is during the bloom and boll maturation periods. At peak bloom, the plant needs about 0.3 inches of water per day.

Many uncertainties exist as to HOW to irrigate. With the exception of 2003 and 2005, recent years have been characterized by severe, persisting drought, and many irrigated fields have fallen well below expectations in terms of yield and fiber quality. Considerable research is needed to improve our understanding of plant water use, irrigation timing, and irrigation efficiency.

In the past irrigation of cotton prior to blooming was initiated when planted wilted or showed stress by mid-day. Recent research has indicated that once cotton begins to wilt it has already been under physiological stress for some time. Prior to bloom cotton will utilize 0.75 to 1 inch of water per week. Thus, under hot and dry early season conditions to optimize yield potential the crop should be irrigated with this amount prior to the signs of stress. It should also be recognized however, that abundant moisture magnifies vegetative growth problems when excessive nitrogen is available and/or insect control is insufficient.

After first bloom, irrigate as needed to supply the quantities of water listed below. Rain gauges should be used to measure the water received from rain and the amount supplied by irrigation.

Cotton Irrigation Schedule Suggested For High Yields

	900/1100 lb/A		1200/1500 lb/A	
	In./Week	In./Day	In./Week	In./Day
Wk. beginning at 1st bloom	1	0.15	1.5	0.22
2nd wk. after 1st bloom	1.5	0.22	1.5	0.22
3rd wk. after 1st bloom	2	0.3	2.5	0.36
4th wk. after 1st bloom	2	0.3	2.5	0.36
5th wk. after 1st bloom	1.5	0.22	2.5	0.36
6th wk. after 1st bloom	1.5	0.22	2	0.3
7th wk. after 1st bloom	1	0.15	2	0.3

Weekly quantities should be increased to compensate for run-off.

Examine the crop during the 7th week (900 to 1100 lb) and 8th week (1200 to 1500 lb) to determine if irrigation should be continued. Additional irrigation may be needed on deep sands and/or if hot dry conditions are predicted and the plants are experiencing wilt. Irrigation intervals can be determined by dividing the quantity/day for a period into ½ to ⅔ the available moisture holding capacity of the upper 2 ft of soil in fields. For example, if the available moisture capacity of the soil is 0.7 inches/ft and the quantity/day is 0.3 inches, the interval between irrigations or following rain that brings soil moisture to field capacity would be 0.66 (available moisture) x 2 ft x 0.7 inches/ft divided by 0.3 inches/day = 3.08, which is rounded to 3 days.

Intervals for most of the season will be 3 to 4 days for coarse textured sand, 4 to 6 days for more productive loamy sand and sandy loam, and 5 to 8 days for fine textured sandy loam or clay soils. A 4 to 6 day interval will fit a majority of the situations.

Growers with intensely managed production programs that are already harvesting 2-bale yields and are striving for 3-bale-plus yields on part of their crop may want to increase the amount of water supplied by irrigating to provide the quantities of water listed on the right side of the table above on a trial basis. This will provide 4 inches more during the 7-week period than is suggested for 2-bale yields.

Irrigation termination is a difficult decision. A final watering is often made when the crop begins to open. Commonly, NO additional irrigation is applied once the time the crop is 10 percent open to minimize problems with boll rot, hard lock, and light spot. Common sense factors include prevailing weather patterns and predictions, available soil moisture, and time of year.