

Effect of Water Stress on Tall and Short Cultivars of Pima and Upland

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Summary

Short cultivars were earlier, used less water, were less influenced by water stress, and were more productive than tall cultivars.

Three Pima, three upland cultivars, and four interspecific hybrids were evaluated for responses to water stress. Water consumption was determined by means of a neutron probe. Cultivars receiving half-normal irrigation were about 70% as tall as, and exhibited an earlier flowering and maturing of fruit, than in the normally irrigated plots. The stressed plots received less than half the water of the normal plots because of reduced permeability to water of the drier soil. Increased growth rates were exhibited by the interspecific hybrids. The Pima cultivars of short stature exhibited an apparent growth and fruiting cut-out in response to the boll load, a phenomenon commonly found in uplands but not in Pima. In the half-irrigated plots, the water stress accentuated this cut-out in all cultivars except the tall Pima.

Both Pima and upland cultivars in mild water-stressed plots exhibited shorter plants, open canopies, less early-season square and boll shed, and about 23% lower yields than in non-stressed plots. In most comparisons, the short cultivars were earlier and more productive than the tall ones. The short cultivars use less water, apparently because of smaller leaves and shorter roots.

EFFECT OF FINAL IRRIGATION ON YIELD

C. R. Farr

Early September final irrigation has increased yield over late August irrigation an average of 84 pounds of lint per acre in 27 on-farm tests during 16 years. Increases have ranged from 28 pounds at Buckeye in 1980 to losses in two years. Comparisons have been made in various areas on different soil types with seasonal weather variations. This 1982 test result is very similar to the outcome of an earlier test with the same grower.

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FINAL IRRIGATION DATE	LBS. LINT PER ACRE	GROUND COTTON PER ACRE	TOTAL LINT PER ACRE
August 22	1266	99	1365
September 5	1263	99	1362

Crop history: cotton; Soil type: Loam; Fertilizer: 130 lbs N as NH₃ in 2 applications, 45 lbs. N. in water; Irrigation: 4.7 acre-feet, 9 irrigations; Insecticide applications: 5; Defoliation Sept. 20, Oct. 1; Harvest: 1st pick Oct. 20, 2nd pick Dec. 19.