LINT YIELD AND FIBER QUALITY AS A FUNCTION OF SOIL MOISTURE

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Abstract

Inconsistencies in yield and fiber quality are of paramount concern to breeders, producers, and the textile industry. Improvements in consistency of fiber uniformity and other fiber properties will enhance the value of U.S. cottons as we compete in the world marketplace. This study will serve as a stepping-stone to other research efforts concerning drought tolerance, stability, and plant mapping.

Goals

The primary goal of this project was to determine yield and fiber quality stability of 12 commercial cultivars and 60 experimental breeding lines. We would also like to determine if this study will provide information helpful in selecting for drought tolerance. The other goal of this study is to determine if plant mapping within the confines of this study relates to stability and or drought tolerance.

Methodology

Differential irrigation rates of 0.1in./day, 0.2 in./day, and 0.3 in./day were applied by subsurface drip throughout the growing season. Plant mapping was initiated at first bloom and continued on a weekly basis until crop termination.

Future Opportunities

Future tests of this nature will include a rain-fed treatment. Future tests will include fewer entries allowing for more detailed information and analyses. Future test will allow for collection of extensive data on growth and development.
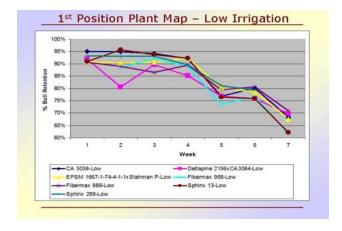
Preliminary Results

Table 1. Entries ranked by yield and fiber length across irrigation treatments. Emphasis on length ranking.

Entry	Length Rankings by Treatment (actual fiber length)			Yield Rankings by Treatment (yield)		
	.3 in./day	.2 in./day	.1 in./day	.3 in./day	.2 in/.day	.1 in./day
15	1 (1.19)	1 (1.15)	1 (1.15)	66 (1066)	37 (1124)	35 (674)
27	3 (1.14)	2 (1.13)	2 (1.09)	48 (1175)	66 (981)	71 (485)
29	33 (1.08)	33 (1.04)	33 (1.00)	49 (1171)	62 (1005)	59 (619)
61	71 (0.98)	65 (0.99)	70 (0.90)	8 (1427)	12 (1238)	55 (623)
66	69 (1.00)	6 (0.98)	72 (0.83)	29 (1284)	26 (1170)	19 (704)
68	72 (0.97)	72 (0.93)	71 (0.88)	6 (1446)	4 (1328)	3 (791)
2	30 (1.08)	13 (1.07)	7 (1.03)	63 (1078)	70 (949)	38 (665)
4	48 (1.06)	5 (1.09)	15 (1.02)	70 (1015)	63 (991)	72 (448)
7	20 (1.09)	39 (1.04)	6 (1.04)	52 (1148)	69 (960)	54 (629)

Table 2. Entries ranked by yield and fiber length across irrigation treatments. Emphasis on yield ranking.

Entry	Yield Rankings (yield) by Treatment					
	.3 in./day	.2 in./day	.1 .in/day	.3 .in/day	.2 . in/day	.1 .in/day
65	1 (1608)	3 (1335)	1 (1046)	37 (1.08)	56 (1.00)	21 (1.01)
67	5 (1447)	1 (1415)	5 (769)	21 (1.09)	32 (1.05)	41 (0.98)
68	6 (1446)	4 (1328)	3 (791)	72 (0.97)	72 (0.93)	71 (0.88)
4	70 (1015)	63 (991)	72 (448)	48 (1.06)	5 (1.09)	15 (1.02)
6	69 (1024)	72 (864)	67 (557)	59 (1.03)	41 (1.03)	40 (.99)
16	60 (1099)	57 (1029)	57 (620)	6 (1446)	4 (1328)	3 (791)
10	42 (1201)	21 (1238)	2 (827)	63 (1078)	70 (949)	38 (665)
5	35 (1244)	27 (1163)	7 (759)	70 (1015)	63 (991)	72 (448)
22	36 (1238)	44 (1088)	6 (768)	52 (1148)	69 (960)	54 (629)