REPLICATED AGRONOMIC COTTON EVALUATION (RACE) TRIAL IN THE ROLLING PLAINS OF TEXAS-2018

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Abstract

Cultivar selection is one of the most important decisions producers need to make before planting; however, it has become more difficult to make the decisions as new cultivars are available on the market each year with advanced herbicide technologies. To help support cotton producers make decisions on cultivar selection, we conduct replicated on-farm large plot cultivar trials. Our objective of this project is to provide agronomic information of advanced cotton cultivars to producers in the Rolling Plains of Texas. Twelve cotton cultivars of mixed advanced technologies (NG4689B2XF, NG4777B2XF, NG4545B2XF, FM2498GLT, ST5122GLT, FM2574GLT, ST5517GLTP, DP1522B2XF, DP1646B2XF, DP1549B2XF, PHY480W3FE, and PHY440W3FE) were planted in 9 locations across the Rolling Plains of Texas. Cotton trials were planted on-farm with plot size varying from 0.0006 to 1.40 ac. The study was replicated three times and designed as randomized complete block design. Lint yield and fiber quality will be reported after harvest.

Introduction and objectives

Cultivar selection is the most important decision made by the cotton (*Gossypium hirsutum* L.) producers especially in the Rolling Plains of Texas, where dryland cotton production is dominant. With the expansion of transgenic technology, new seed treatments for both early season insects and disease management, and new genetics, cultivar selection has become even more critical, and one of the biggest expenses of growing cotton. Therefore, the objective of this project was to compare yield and lint quality of Stacked-Gene insect and herbicide tolerant cultivars grown in large plot replicated trials on producer-cooperator fields in the Rolling Plains region of Texas.

Materials and methods

Eight cultivars were planted in 5 dryland and 4 irrigated fields across the Rolling Plains of Texas. Cultivar selection were determined with input from grower cooperators/committees, Extension faculty, and seed industry representatives. Plot size ranged from 0.1 to 1.4 acres in size, depending on the location (Table 1). Study was designed as a CRBD with 3 replications. All trials were machine harvested with grower harvesters. Plot weights were determined using a boll buggy equipped with integral electronic scales. Sub-samples from each plot were ginned with a 10-saw table-top gin with no lint cleaner. This table-top gin method consistently produces higher lint turnout percentages as compared to a commercial gin due to having no lint cleaner. Consequently, presented lint yields are generally higher than area-wide commercial yields. Lint quality will be quantified by a high volume instrument (HVI) at the Fiber and Biopolymer Research Institute at Texas Tech University in Lubbock, TX. Analysis of variance was conducted using proc GLM of SAS.

Table 1. Trial location, cooperator, planting date, harvesting date, plot size information of 2017 Texas A&M AgriLife Extension Service RACE trial

County	Producer cooperators	County Extension Agents	Irri/ dry	Planting date	Harvest date	Rows × width	Seeding Rate (seeds ac^{-1})	Seeds ft^{-1}	Plot size (ac)
Childress	Cade Wyatt	Ryan Martin	D	6/1	12/14		Abandoned		
Collingsworth	Rex Henard	Kenny Patterson	I	5/9	11/7	11/5			
Dickens	Gary Myers	Thomas Boyle	D	6/5	12/22	12/4	6 rows x 40”	26000	2.0
Hardeman	TAMU	Justin Gilliam	D	5/30	NA	11/15	4 rows x 40”	52272	4.0
Hardeman	TAMU	Justin Gilliam	I	5/10	11/6	11/19	4 rows x 40”	52272	4.0
Haskell	Kregg Sanders	Vacant	I	6/15	11/16	TBD	6 rows x 40”	32670	2.5
Kent	Guy Walker	Brandon Cave	D	6/15	TBD				
Motley	Josh Lee	Taylor Chapa	I	5/31	NA		Abandoned		
Wilbarger	Donald Shoppa	Langdon Reagan	D	5/24	NA				

Results and Discussion

Planted acre of cotton were 1.3 million acres, up 16% in the Rolling Plains of Texas. However, 48% of the total planted acres has been harvested as of January 1st. Severely dry winter and spring left limited moisture during planting for 2018 cotton season (Fig. 1). The dry condition continued until September, where most of dryland cotton was stressed with lack of moisture and high temperature (Fig. 2). It started raining at the end of September continued until November, which delayed defoliation and harvesting of many fields. Fiber quality may have been affected due to the continuous rain and excessive vegetative growth. Total of 9 trials were planted for 2018 RACE trials; however, 4 trials have been lost due to the lack of moisture and snow storm. Among the trials harvested, average yields were 1258 and 381 lb ac^{-1} in irrigated and dryland, respectively (Table 2 and 3). Fiber quality and loan values will be available by mid-January.

Conclusion

2018 cotton production was below average yield due to the unfavorable weather events for cotton production.

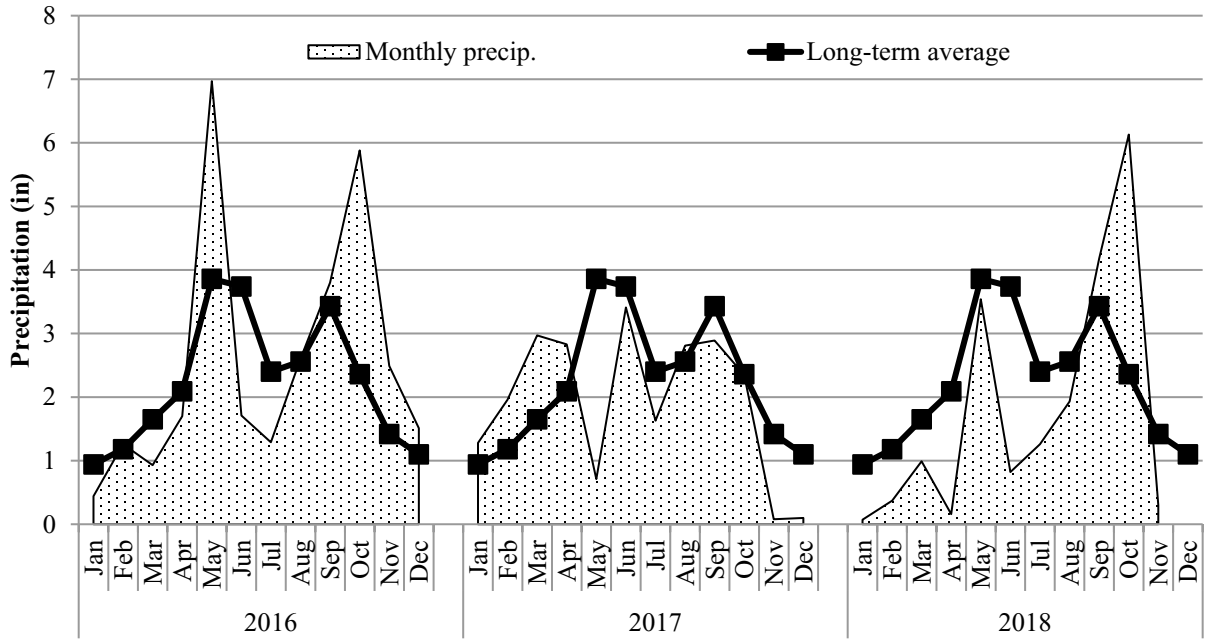

Figure 1. Precipitation during May to 2016-2018.

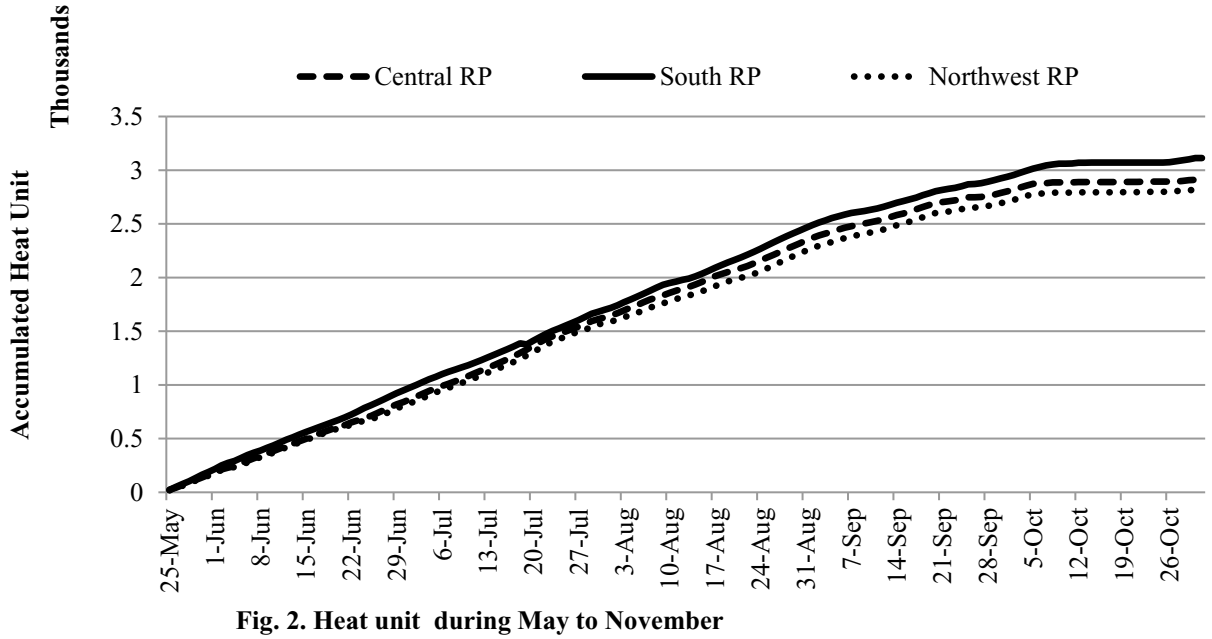

Figure 2. Heat unit during May to November 2018.

Table 2. Lint yield (lbs/ac^{-1}) in irrigated trials

Varieties	Collingsworth		Hardeman		AVG
	Lint	Turnout	Lint	Turnout	
PHY440W3FE	2138 a	0.40	928 a	0.35	1533
PHY480W3FE	2051 ab	0.38	906 ab	0.35	1478
FM2498GLT	2081 a	0.40	848 ab	0.35	1465
ST5122GLT	1887 bc	0.40	863 ab	0.35	1375
NG4689B2XF	1816 c	0.39	804 bc	0.35	1310
NG4777B2XF	1649 d	0.37	729 c	0.35	1189
DP1522B2XF	-	-	859 ab	0.35	859
DP1646B2XF	-	-	852 ab	0.35	852
Mean	1937	0.39	849	0.35	1258
***P*>F**	0.0025	0.0910	0.1079	-	-
CV %	5.8	3.1	8.5	-	-

Table 3. Lint yield (lbs/ac^{-1}) in dryland trials

Varieties	Childress*	Wilbarger*	Dickens*	Stonewall**	AVG
DP1549B2XF	449 a	0.32	393	0.44 bc	421
PHY480W3FE	427 ab	0.32	376	0.44 bc	402
NG4545B2XF	435 a	0.32	366	0.43 bc	401
ST5517GLTP	458 a	0.32	308	0.42 c	383
NG4689B2XF	377 c	0.32	359	0.43 bc	368
FM2574GLT	378 bc	0.32	342	0.45 bc	360
PHY440W3FE	442 a	0.32	275	0.43 bc	359
DP1522B2XF	349 c	0.32	362	0.47 a	355
Means	414	0.32	348	0.44	381
P>F	0.0408	-	0.5066	0.03	-
CV %	8.2	-	20	3.3	-

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