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**COTTON VARIETY PERFORMANCE IN THE SOUTHERN HIGH PLAINS
AND ROLLING PLAINS OF TEXAS**

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Abstract

The selection of cotton varieties is the most important decision producers make. With technologies, pest issues, production issues and environmental conditions changing from year to year, comes the need to have multiple observations of how varieties perform. Differences in other factors such as soil type, irrigation method and capacity can affect variety performance. Seven large or small plot field trials were conducted during the 2011 growing season in either the Southern High Plains or Rolling Plains of Texas. Several locations were initially chosen because of history of Fusarium wilt or Root-knot nematode; however, disease development was negatively affected by the harsh conditions experienced, thus variety performance was determined principally on lint yield. Overall, yields were low compared to long term averages as a result of severe drought and high temperatures. Despite low disease pressure, commercial standards such as Deltapine 174RF, Stoneville 5458B2F and Stoneville 4288B2F performed well at most locations with history of disease. While these trials were greatly influenced by the environmental conditions experienced, they allowed for additional observations of promising new varieties such as PhytoGen 499WRF, Deltapine 1044B2RF, Fibermax 2484B2F and Fibermax 2989GLB2. Continued testing under varying environmental conditions is needed to better understand the performance of cotton varieties in these regions.

Introduction

Variety selection is the single most important, yet difficult decision cotton producers must make. The introduction of new varieties with emerging technologies compounded with differing production and pest management issues has led to continued need for variety testing programs. Information from both small and large scale testing provides important insight into the performance of varieties. The objective of this work was to evaluate commercially available cotton varieties under varying field conditions in the Southern High Plains and Rolling Plains of Texas.

Materials and Methods

Seven large or small plot trials were conducted across the region (Fig. 1). Field history and environmental conditions varied by location. Lint yields of varieties evaluated were compared under different soil types, irrigation systems and capacity. Trials on the High Plains were conducted in fields with a history of Fusarium wilt and/or Root-knot nematodes. Varieties were arranged in a RCBD with three to eight replications. Comparisons were made using ANOVA and means were separated using Fisher's Protected LSD ($P \leq 0.05$).

Results and Discussion

Record hot and dry conditions were experienced across the region in 2011. Little to no disease development was observed at any location; however, variety effects were significant at all locations.

High Plains: Despite the abnormal conditions varieties with partial resistance to Root-knot nematode (ST 5458B2F, ST 4288B2F) performed well at four of the five locations (Tables 1-4). Several newly released varieties such as, DP 1044 B2RF and PHY499WRF ranked in the top at least one of the two locations. The performance of varieties such as PHY367WRF and NG 4010B2RF were intermediate (Tables 1-3).

Rolling Plains: At Munday (under furrow irrigation) lint yields averaged 1,421 lb/A, and were highest for NG 4010 B2RF, DP 1044B2RF and AT 81227B2RF (Table 5). Yields at the Quail location averaged 1,004 lb/A, and were highest for PHY499WRF, DP 0912B2RF, DP 1044B2RF and FM 9170 B2F (Table 6).

Yields were considerably lower than normal, due to adverse conditions. The inconsistent performance of varieties across locations within similar environments more than likely resulted from differences in irrigation capacity between locations. Caution should be taken when using these data for recommendations, because of such extreme environmental conditions. Continued comparisons of these varieties under a broad range of conditions are needed.

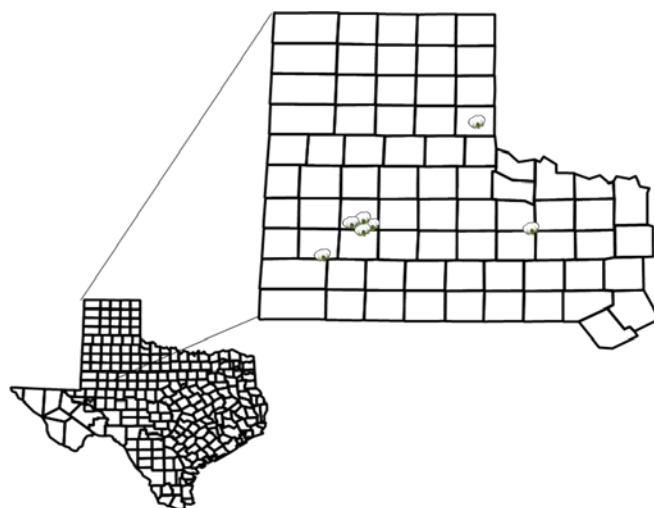


Figure 1. Location of field trials in the High Plains and Rolling Plains, 2011.

Table 1. Lint yield of cotton varieties grown near Lubbock, TX (Thiel location).

Variety	Yield (lb/A)
PG499WRF	1694.3 a
ST5458B2	1591.5 ab
ST4288B2	1585.9 ab
NG4111RF	1452.9 abc
FM2484B2	1450.1 abc
PG565WRF	1388.8 abc
DP1050B2	1372.8 abc
FM9160B2	1359.6 bc
DP1137B2	1341.7 bc
PG367WRF	1318.1 bc
NG4010B2	1241.7 c
FM1880B2	1213.5 c
PG375WRF	1198.4 c
DP1048B2	1194.6 c
FM2989GL	1193.7 c
NG4012B2	1172.9 c
DP1044B2	1166.3 c
DP1133B2	1162.5 c
LSD (P≤0.05)	341.1

Table 2. Lint yield of cotton varieties grown near Brownfield, TX (Martin location).

Variety	Yield (lb/A)
ST4288	456.5 a
DP1044	417.5 ab
ST5458	406.6 ab
FM2989	390.4 abc
PG499	364.3 abcd
NG4111	340.5 abcde
DP0935	325.3 bcdef
DP174	312.3 bcdefg
BCS Exp	311.2 bcdefg
PG367	305.8 bcdefg
DP Exp	286.3 bcdefg
FM2484	271.1 bcdefg
PG565	265.7 defgh
FM1880	258.1 defgh
DP1050	251.6 defghi
FM9160	251.6 defghi
DP1133	245.1 defghi
NG4010	236.4 efghi
NG4012	231.0 efghi
AT65207	228.8 efghi
DP Exp	226.6 efghi
BCS Exp	224.5 efghi
AT81220	224.5 efghi
PG375	219.0 fghi
AT Exp	216.9 fghi
DP Exp	213.6 fghi
DP1137	208.2 fghi
DP Exp	199.5 ghi
DP Exp	196.3 ghi
DP Exp	184.4 hi
DP1048	183.2 hi
DP Exp	135.5 i
LSD (P≤0.05)	120.3

Table 3. Lint yield of cotton varieties grown in two Lubbock, Co. TX (Harrelson and Thiel locations).

Variety	Lint yield (lb/A)	
	Harrelson	Thiel
ST 4554 B2F	286 b	709 a
DP 174 RF	303 b	693 a
PHY367 WRF	333 ab	689 a
ST 5458 B2F	308 b	679 a
DP 0935 B2RF	382 a	667 ab
DP 104 B2RF	312 b	637 bc
PHY375 WRF	311 b	598 bc
FM 9160 B2F	313 b	574 c
LSD ($P \leq 0.05$)	50	73

Table 4. Lint yield of cotton varieties grown near Roosevelt, TX (Clark location).

Variety	Yield (lb/A)
ST 4288B2F	670 a
ST 5458B2F	637 a
PHY367WRF	614 ab
NG 4010B2RF	598 bc
FM 9170B2F	550 c
DP 1034B2RF	498 d
LSD ($P \leq 0.05$)	65

Table 5. Lint yield of cotton varieties grown near Munday, TX (Wilde location).

Variety	Yield (lb/A)
NG 4010B2RF	1,597 a
DP 1044 2RF	1,507 ab
AT 81227B2RF	1,476 ab
FM 2484B2F	1,446 b
AT 81220B2RF	1,442 b
ST 5458B2F	1,433 b
FM 1740B2F	1,412 bc
NG 4012B2RF	1,401 bc
FM 9170B2F	1,381 bcd
DP 1133B2RF	1,282 cd
FM 2989GLB2	1,256 d
LSD ($P \leq 0.05$)	140

Table 6. Lint yield of cotton varieties grown near Quail, TX (Watts location).

Variety	Yield (lb/A)
PHY 499WRF	1,353 a
DP 0912B2RF	1,225 ab
DP 1044B2RF	1,201 ab
FM 9170B2F	1,143 abc
PHY565WRF	1,022 bcd
DP 1032B2RF	979 bcd
NG 4012B2RF	977 bcd
ST 5458B2F	972 bcd
NG 4010B2RF	893 cde
FM 2989GLB2	846 cde
FM 1740B2F	782 de
DP 1133B2RF	654 e
LSD (P≤0.05)	303

Acknowledgements

The technical support of Ellen Ryan, Justin Spradley, Ira Yates and Rebecca Grubbs is greatly appreciated. We also thank Texas Cotton State Support for funding of this project. Special thanks to producers Jimmy Clarke, Gary Harrelson, Aaron Martin, Bernie Thiel, Robert Watts and Gary and Michael Wilde for providing fields to conduct these trials.

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