

**EFFECT OF IRRIGATION AND HERBICIDE PROGRAM
ON DP 444 BGRR® AND SG 215 BR® YIELD AND QUALITY**
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Abstract

DP 444 BGRR is an early season cotton variety that has performed well in experiments across central and south Alabama. This variety exhibits an anomaly that results in a split terminal. An experiment was conducted in north Alabama at the Tennessee Valley Research and Extension Center to investigate the occurrence of this anomaly under dryland/irrigated conditions and under conventional/glyphosate-based herbicide systems. In the first year of this study, there was no influence of irrigation or herbicide system on the occurrence of the split terminals. The overall occurrence of the split terminal anomaly was 11.3% in the stand. Bolls taken from plants with split terminals were found to have higher turnout, lower overall lint and seed weights, and similar lint quality compared to bolls taken from normal plants.

Introduction

DP 444 BGRR® has shown promise in on-farm trials in Alabama and was the highest yielding variety in the early maturity variety trial at the Tennessee Valley Substation in 2003. An interesting anomaly that DP 444 BGRR exhibits is called the “Y-syndrome”. It is characterized by Y-shaped plants that occur as a result of a splitting of the terminal bud early in the life of the plant. While this occurred in a small percentage of plants in our evaluations, we have not seen in a large-scale yield or quality loss. Our goal was to determine if the Y-syndrome occurrence is influenced by irrigation or herbicide application and to compare it to an older variety.

Our objectives were: 1) to compare the effects of irrigation and herbicide program on growth, yield, and quality of DP 444 BGRR and SG 215 BR®; and 2) to compare the response of normal and Y-syndrome plants to the same treatment regime.

Materials and Methods

Cotton was planted in a conservation tillage system on 1 May 2003. Plot size was 8-rows by 30 feet in 40-inch row spacing. The experimental design was a 2x2x2 factorial arrangement of treatments in a randomized complete block with four replications. Irrigation treatments included irrigated and dryland; herbicide programs included conventional- and glyphosate-based systems; and varieties included DP 444 BGRR and SG 215 BR.

Herbicide systems for all plots included fluometuron (1.25 lbs/A) plus prometryn (1.5 pt/A) applied preemergence. The glyphosate-based (Roundup Ultra®) system utilized glyphosate at 28 oz/A applied over-the-top two weeks after planting and post-directed. The conventional-based system included prometryn (1 qt/A) plus MSMA (1 qt/A) post-directed.

Data collection included the following:

1. Stand, NAWF, “Y-syndrome” occurrence, and various yield and quality parameters;
2. Lint yield, quality and turnout were determined from 50-boll samples from normal and “Y-syndrome” plants.

Results and Discussion

Results from large plots indicated no 2-way interactions and very slight differences when 3-way interactions were considered; therefore, main effects are presented below (see Table 1).

1. Irrigated cotton had higher yield, lower micronaire, and lower turnout compared to the dryland plots;
2. Maturity was slightly earlier in DP 444 BGRR than SG 215 BR in mid-July;
3. Yield was higher in DP 444 BGRR than SG 215 BR;
4. Turnout from large plot gin weights was lower in DP 444 BGRR than SG 215 BR;
5. In general, DP 444 BGRR had higher strength, longer staple, and lower micronaire than SG 215 BR.

When Y-syndrome plants were considered in the DP 444 BGRR; the following was noted:

1. Occurrence of “Y-syndrome” plants in the stand was 11.3%;
2. Occurrence of the “Y-syndrome” was not influenced by irrigation or herbicide program;
3. Micronaire, length, strength, and uniformity were not different on normal or “Y-syndrome” plants;
4. “Y-syndrome” bolls had higher lint turnout but lower total weight, seed weight, and lint weight compared to bolls from normal plants.

Table 1. DP 444 BGRR and SG 215 BR response to irrigation and herbicide program (large-plot data analysis).

Parameter	Irrigation	Herbicide	Variety	Average
Stand	NS (0.05)	NS	NS	82 plants/20 ft.
Nodes/plant	NS	NS	NS	14.7 nodes/plant
NAWF	NS	NS	*2) Results	----
Lint yield	*1) Results	NS	*3) Results	----
Micronaire	*1) Results	NS	NS	----
Staple	NS	NS	NS	35.5
Uniformity	NS	NS	NS	84%
Strength	NS	NS	NS	30.4 g/tex
Turnout	*1) Results	NS	*4) Results	----