Use of Selected Fungicides to Elongate the Maturity of a Mid-Season Upland Cotton Variety

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ABSTRACT

Biotic and abiotic stresses are the largest reducers for lint yield potential (Falkenberg et al., 2007) in a cotton crop; however identifying every stress imposed on a field is impossible due to input restrictions. The objective of the present study is to identify responses of cotton to selected fungicides and their effects on prolonging the flowering stage of Stoneville 4554 Bollgard II Roundup Ready ® and the potential for improved lint yield and fiber qualities. Treatments were imposed on two identified growth stages: First Flower (FF) and First Flower +14 days (FF+14). Physiological measurements were taken in the days following application and final plant mapping was conducted prior to harvest aid application. Statistical differences were noted for lint yield, while all other data was unchanged .

INTRODUCTION

This trial was developed to investigate potential methods for the delaying maturity or extending the growing season of cotton through currently available means with the focus on plant health parameters. Two compounds: pyraclostrobin (Headline®) and azoxystrobin (Quadris®) were used in an effort to lengthen the growing season through changes in the plant symbolized by the position of the node above white flower (NAWF). Treatments that included other commonly used chemical formulations, which would be applied during this growth window, were also included to observe potential impacts on lint yield. Previous unpublished work indicated that maintenance of plant health parameters could extend the growing season. Potential yield losses from a reduced growing season could possibly be deterred through focus on plant health care.

OBJECTIVES

To compare the effects of Headline® and Quadris® on the Stoneville 4554 Bollgard II Roundup Ready Flex® cotton variety by monitoring NAWF movement through the canopy , as well as the impacts these fungicides have on fiber quality and lint yield.

John Deere 9910 Harvesting the Plot Area

Fig 1.

Headline Treatments Lint Pound Per Acre (Lbs/A)

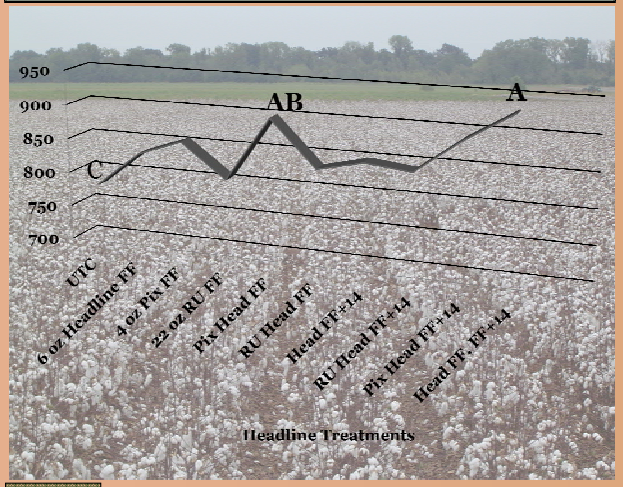

Table 1.

t Grouping	Mean	Treatment
A	929	Headline FF, FF+14
AB	898	Pix and Headline FF
AB	889	Pix and Headline FF+14
ABC	854	Pix FF
ABC	847	Headline FF+14
ABC	840	RU and Headline FF+14
BC	832	RU and Headline FF
BC	831	Headline FF
BC	805	Roundup Magnum (RU)
C	780	Untreated Control (UTC)
P Value: 0.0613		
Coefficient Variance: 7.7502		
R^2 value: 0.49154		

Table 2.

Quadris Treatments Lint Yield (lbs/A)

Mean	Treatment
911	Pix and Quadris FF+14
906	Quadris FF+14
875	RU and Quadris FF
872	Quadris FF
842	Roundup Magnum (RU) FF
834	Pix FF
829	Quadris FF, FF+14
828	Pix and Quadris FF
813	Untreated Control (UTC)
792	RU and Quadris FF+14
P Value: 0.2437	
Coefficient Variance: 7.8314	
R^2 value: 0.4659	

METHODS AND MATERIALS

The experiment was conducted on a Weswood silt loam soil at the Texas AgriLife Research Farm in Burleson County, Texas. Plots were arranged in a Randomized Complete Block design seeded with one variety, Stoneville 4554 Bollgard II Roundup Ready Flex® cotton. The plot area was fertilized uniformly with 120 units of nitrogen per acre using liquid 32-0-0. Plots were treated with pyraclostrobin and azoxystrobin at the rate of 6 oz/acre of fluid material as well as tank mixed with commonly used chemicals that would be applied during this growth stage of first flower and first flower +14 days. Treatments consisted of an untreated control (UTC), the respective fungicides, Pix® at a rate of 4 oz/acre, Roundup Magnum® (RU) at a rate of 22 oz/acre, the combination of fungicide and Pix®, the combination of fungicide and RU. These treatments were applied at first flower (FF), first flower +14 days, and fungicides were finally applied in tandem at FF and FF+14 days. The plot areas were harvested with a John Deere 9910 two-row spindle high drum picker. Fiber samples were sent to the International textile Center in Lubbock, Texas for HVI fiber quality measurements. Statistical analysis was conducted using the SAS© 9.2 system while performing PROC GLM and PROC MIXED procedures, as well as further analysis containing the Tukey adjustment for HSD.

RESULTS & DISCUSSION

Statistical difference was shown for lint yield (Lbs/A) of treatments with pyraclostrobin (Headline®) *P-Value*= 0.0613 (Table 1). An increase of 150 lint Lbs/A difference was observed between the UTC and the fungicide treatment that occurred at FF followed by FF+14 (Figure 1). No statistical difference was shown between any treatment of azoxystrobin (Quadris®) (Table 2). All other treatments failed to show significant statistical difference from the UTC. No detrimental effects were observed statistically for any of the tank mix combination treatments

REFERENCES

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