

ASSESSMENT OF FUNGICIDES TO MANAGE FOLIAR DISEASES OF COTTON IN GEORGIA 2004-2008

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Abstract

Field trials were established in Georgia between 2004 and 2008 to assess the efficacy of fungicides to reduce the severity of foliar diseases of cotton and to improve yields. In 2004, 2005, and 2008, trials were established on the Coastal Plain Experiment Station, Tifton, Georgia, at the RDC Pivot. Plots in each study were 40 ft long by two rows wide (36 in. row spacing). Plots were separated from each other by two unsprayed border rows. Each treatment was replicated four times and the plots were arranged in a randomized complete block design. Similar field trials were established at the University of Georgia's Attapulgus Research and Education Center, Attapulgus, Georgia, in 2005, 2006, and 2008. Plot characteristics and experimental design were similar to those established in Tifton. In 2007 a large-plot study was established at Southeastern Gin and Peanut Company in Surrency, Georgia. Plots were 18 rows wide by the length of the field (approximately 1000 ft) and treatments were replicated three times. The variety Delta and Pineland 555 B/RR was planted in each study during May of the corresponding year. All management practices, e.g. fertility, weed management, insect management, and defoliation, followed recommended practices from the University of Georgia Cooperative Extension. All fields were irrigated as needed throughout the season and harvested with spindle-type pickers.

Fungicide treatments, pyraclostrobin (Headline 6-9 fl oz/A), azoxystrobin (Quadris, 6-9.2 fl oz/A), and thiophanate methyl (Topsin-M, 16 fl oz/A) were initiated at either "full bloom" (defined as 50% of plants at first bloom) or two weeks after full bloom. Additional fungicide applications were made 14 and 28 days after the first spray for appropriate treatments. Fungicides were applied in 15-20 gal/A spray volume using a Lee-Spider boom sprayer or tractor-mounted boom sprayer at 35-40 PSI. Plots were taken to yield and typically rated for % defoliation, severity of leaf spot, and, in 2008, disease severity measured as % leaf area affected using the ASSESS computer software from the American Phytopathological Society, Minneapolis, MN.

The foliar diseases observed in the field trials included *Cercospora* leaf spot, *Stemphylium* leaf spot, *Ascochyta* wet weather blight, aereolate mildew, and *Alternaria* leaf spot. Severity at the end of the season ranged from modest leaf spotting on the untreated controls to complete defoliation in at least one study (2007 Southeastern Gin and Peanut). In the 2004 Tifton study, treatment with three applications of either pyraclostrobin (6.14 or 9.2 fl oz/A) or azoxystrobin (6.14 fl oz/A), each tank-mixed with growth regulator Pentia, numerically reduced the severity of leaf spot and significantly reduced the % defoliation at the end of the season. Although yields (seed cotton, lb/A) were typically greater in plots treated with fungicides (by as much as 477 lb seed cotton/A) over the corresponding control, the increased yield was statistically significant ($p \leq 0.05$) in only one of eight treatments. In the 2005 Attapulgus study, % defoliation was typically statistically lower at the end of the season in plots treated with three applications of pyraclostrobin or thiophanate methyl, but not with two applications of azoxystrobin when compared to the untreated controls. Yields in plots treated with fungicides were typically numerically, but not statistically, greater than the untreated control. In trials conducted at Attapulgus between 2005 and 2008 and Tifton in 2008, the severity of foliar disease in treated plots versus untreated plots was never observed to be statistically different. Also, yields from treated plots were not statistically different from untreated plots. In the 2007 field trial conducted at the

Southeastern Gin, two applications of pyraclostrobin, azoxystrobin, or thiophanate methyl significantly reduced both severity of aereolate mildew and Ascochyta wet weather blight and late season defoliation. However improved disease control did not result in increased yield over the untreated plots.

In conclusion, field studies conducted over a five-year period at three different locations are reported here. Severity of foliar disease ranged from low to high. Cotton treated with fungicides showed reduced defoliation the end of the season in several trials and also numerical reduction in leaf area affected by disease in some studies. However, over the five seasons in which this study was conducted, there was only a single instance where the yield increase between treated and untreated plots was statistically significant. Given that the fungicide treatments appear to have some benefit for disease control, this assessment of fungicides will continue to try and determine which diseases are of economic importance and to better time applications for improved disease control and yield.