

EFFECT OF HEADLINE APPLICATIONS ON TARGET SPOT IN COTTON

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Introduction

Extended periods of wet weather and high humidity often occur during the cotton growing season in Georgia. These conditions, especially in cotton fields with a dense canopy, can lead to development and spread of foliar diseases such as target spot. Target spot is caused by the pathogen *Corynespora cassiicola* and can lead to premature defoliation and potentially reduce yield.

Target spot of cotton was first identified as a possible problem in Georgia in 2005 and has been an issue in many fields during the past few years. Target spot can be identified by its distinct chocolate brown spots on a leaf that frequently demonstrate a pattern of concentric rings. Lesions can also be found on boll bracts and cotton bolls. The affected leaves typically retain their green or green-yellow color, yet ultimately prematurely defoliate.

Symptoms of this disease usually start in the lower canopy where warm temperatures and humid conditions favor development. Progression of symptoms moves up the canopy, affecting progressively younger leaves and fruit. Target spot typically thrives in environments that have a thick crop canopy, often from irrigation or excessive rainfall, and optimum or excessive fertility.

The fungicide Headline (pyraclostrobin) has been used to control target spot in cotton. Headline is a strobilurin type fungicide that can be applied topically to cotton and may provide suppression of target spot. This research investigated cotton response to Headline fungicide applications in areas with high potential for target spot.

Materials and Methods

Research consisted of four tests in east Georgia over two years. Two tests were a large-plot on-farm site in Jenkins County in 2013 and 2014 (eight rows, at least 500 feet long). Two other tests consisted of small-plot sites in 2013 at the University of Georgia Southeast Georgia Research and Education Center in Midville.

PHY 499 WRF was the variety planted in three of the four tests; FM 1944 GLB2 was planted at the Jenkins County test in 2013. In all four tests, the same four treatments were analyzed:

- Not treated with Headline (Untreated)
- Treated with Headline at the first and third week of bloom (1st and 3rd)
- Treated with Headline upon the initial sign of target spot presence (Initial)
- Treated with Headline prior to bloom and at the first and third weeks of bloom (Season-Long)

Each test was a randomized complete block with three replications for both years at the Jenkins County site and four replications at Midville. The different number of replications was due to available research space at each site.

All Headline applications were 6 oz/A. Cotton in all plots was managed similarly except for Headline applications. Plant growth regulators (PGRs) were used to control growth in all locations according to UGA Extension recommendations, except in one Midville site. In this site, no PGRs were used, and cotton was allowed to grow unregulated and ultimately to an excessive height.

All plots were machine harvested and seedcotton samples were sent to the University of Georgia microgin in Tifton for ginning and lint yield determined. Disease ratings and other data were collected throughout the season. Data was analyzed using Proc Mixed in SAS 9.1. Significant effects were separated using Fisher's Protected LSD at P = 0.10.

Results and Discussion

Data were analyzed across locations and significant differences between location and treatments were observed. Therefore, data was analyzed by location. In Jenkins County during 2013 and 2014, fungicide applications had some impact on disease severity and leaf defoliation (data not shown), but no significant differences in lint yield were observed (Table 1). In Midville, where cotton was treated with PGRs as needed to control vegetative growth, all Headline treatments significantly reduced defoliation and disease severity, yet no fungicide treatment significantly improved cotton lint yield. In Midville where no PGRs were used to control growth, a very dense canopy led to a more conducive environment for target spot development. In this location, the two more aggressive Headline treatments reduced defoliation but did not affect disease ratings, and only the season-long treatment significantly increased lint yield over untreated cotton.

Results from this study follow similar work with Headline and management of target spot in cotton. Often, Headline lowered disease severity and leaf defoliation, yet significant differences in yield were less often observed. More work is needed to further understand the effects of fungicides on the management of target spot in cotton.

Table 1. Effect of Headline Fungicide Applications on Lint Yield at the Four Locations

Treatments	Locations				Average
	Jenkins 2013	Jenkins 2014	Midville 2013 (No PGR)	Midville 2013 (PGR)	
Untreated	1243	1484	1495 bc	1726 ab	1486
Initial	1144	1612	1444 c	1669 bc	1464
1 st & 3 rd	1218	1687	1565 ab	1749 a	1552
Season-long	1107	1618	1667 a	1618 c	1503
P-value	0.23	0.41	0.02	0.05	0.48
LSD (P=0.10)	NS	NS	103	78	NS

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