UTILITY OF FUNGICIDES FOR CONTROL OF TARGET SPOT IN NC

Robert J. Tetterton
Oscar C. Hodges
Guy D. Collins
Lindsey D. Thiessen
Keith L. Edmisten
Blake L. Szilvay
North Carolina State University
Raleigh, NC

Abstract

Target Spot is a foliar disease in cotton that occurs occasionally in North Carolina. This disease causes lesions on leaves and generally begins in the lower canopy and progresses upward. This disease can eventually cause defoliation, especially of leaves lower in the canopy and can lead to reductions in yield. Yield losses are thought to occur when the disease begins early in the bloom period with high disease pressure which progresses quickly, resulting in premature defoliation of leaves while development of harvestable bolls remains in progress (http://www.ugacotton.com/vault/file/2017-Georgia-Cotton-Production-Guide.pdf). In some cases, the use of fungicides may be warranted to prevent the disease from becoming established or to slow the rate of progression. Target spot is thought to be more problematic in irrigated conditions or in years with frequent and intense rainfall, high soil moisture retention, in fields with a history of the disease, in reduced-tillage systems, and in taller, full-season varieties with rank growth (http://www.ugacotton.com/vault/file/2017-Georgia-Cotton-Production-Guide.pdf). Research was conducted during 2017 in North Carolina in a field with a history of severe target spot, to investigate the utility of fungicides in controlling this disease. The objectives of this research were to investigate the effects of Target Spot in cotton in a field with a history of severe disease pressure, to investigate the effects of fungicide application on disease incidence, progression, and yield, and to determine if one or multiple applications of fungicide are warranted in order to adequately control the disease.

Replicated trials were conducted at the Tidewater Research Station near Plymouth NC during 2017. The field site consisted of a high organic matter soil with a shallow water table as is commonly observed in the Blacklands region of NC. This particular field experienced very high Target Spot incidence and pressure during August and September of 2016 in a separate cotton research trial. As field history may influence subsequent disease incidence, this research trial was purposefully conducted in this field. Treatments consisted of a Non-Treated Control where no fungicide was applied, Priaxor applied at 4 oz/A at both the first and third week of bloom, and Priaxor applied at 4 oz/A at only the third week of bloom. Percent incidence of Target Spot was collected during late September, shortly prior to defoliation. This trial was managed in a manner to promote rank growth, which is thought to be another promoter of this disease. Cotton was allowed to grow uninhibited in a high moisture environment with a full-season variety known for aggressive growth potential. Plant growth regulator applications were intentionally delayed until mid-bloom so that plant height was taller than is typically ideal for cotton production in this region.

As managed and as expected, plant height was taller than ideal for this region (approximately 50 to 60 inches tall), however plant height accompanied by a lush dense canopy was ideal for disease development. Soil moisture conditions remained high season-long as a function of timely and frequent rainfall accompanied by the shallow water table and high soil moisture retention that is common in this region. Although the incidence and severity of Target Spot was high in 2016 in the same field, the incidence of the disease was relatively and very low in 2017 (less than 9 percent in 2017, greater than 70 percent in 2016), therefore severity was considered very low to nearly non-existent in the majority of the field. As incidence of Target Spot was low, there was no apparent effect of fungicides applied once or twice on disease incidence, as reductions in incidence were only numerical. Additionally, as disease incidence was low, there was also no effect of fungicide applied either once or twice on seed cotton yield. Although frequent rains occurred throughout 2017, the month of September was noticeably drier in 2017 compared to 2016, potentially leading to a lower disease incidence.

Anecdotally speaking, although the 2016 season resulted in prevalent and significant Target Spot in this particular field, there was very little disease present in 2017, suggesting that field history may not consistently predict this disease in NC. Tall cotton with a lush, dense canopy was achieved in this experiment, also suggesting that plant growth may not consistently result in this disease In NC. Due to low incidence of Target Spot in this experiment,

the effect of fungicide application on disease incidence, severity, and yield, and its utility in controlling this disease could not be determined. Target Spot may be an unpredictable disease in N.C., despite field history and soil moisture conditions that promote disease development. Prophylactic applications of fungicides may not be justified for this disease in NC, unless accurate and repeatable methods for predicting this disease become available. Anecdotally speaking, the largest variance in weather between 2016 and 2017 was rainfall and number of rainy/cloudy days in the month of September, suggesting that end-season rainfall may be a major contributor this disease.

Acknowledgements

The authors extend a special thanks to the NC Cotton Producers Association for their continued support of this and other agronomic research for cotton at N.C. State University.

References

UGA Cotton Production Guide (http://www.ugacotton.com/vault/file/2017-Georgia-Cotton-Production-Guide.pdf)