

COTTON STEM CANKER IN NORTH CAROLINA CAUSED BY *PHOMA EXIGUA*

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Abstract

Cotton plants exhibiting various symptoms, including death, wilting, black sunken lesions on stems, and terminal necrosis were detected in northeastern North Carolina in mid-June of 1999. Disease incidence varied from less than 1% to more than 50% in some fields. Microscopic examination of infected stem tissue revealed the presence of the fungus *Phoma exigua*. Pycnidia and spores of the fungus were abundant in stem and terminal tissues.

Introduction

Crossan (1958) considered many isolates of *Ascochyta* isolated from various hosts in North Carolina, including *A. gossypii*, to be synonymous with *Ascochyta phaseolorum*. *Ascochyta phaseolorum* was subsequently synonymized with *Phoma exigua* (Boerema, 1972). A more detailed discussion of the taxonomy of *Phoma exigua* was published by Morgan-Jones (1988).

Wet weather blight (also called ashen spot, or ascochyta blight [Watkins, 1983]) is usually a minor leaf spot caused by *Phoma exigua* (*syn. Ascochyta gossypii*). This disease is common in North Carolina in wet years. Cotton plants exhibiting various symptoms, including death, wilting, black sunken lesions on stems, and terminal necrosis were detected in northeastern North Carolina in mid-June of 1999. Microscopic examination of infected stem tissue revealed the presence of the fungus *Phoma exigua*. Pycnidia and spores of the fungus were abundant in stem and terminal tissues. Stem canker caused by *P. exigua* has not been reported previously in North Carolina.

The sunken canker at a node is the best diagnostic symptom for cotton stem canker. As the cankers become older, they become brown with a shredded appearance. Often, the lower part of the plant is relatively healthy, although the lower leaves may have dropped off as a result of the leaf spot phase of the disease. The disease may be confused with fusarium wilt because of the wilting and dark streaks in the vascular system. The streaks in the stem caused by cotton stem canker, however, do not extend to the root system in most instances.

Discussion

May and June of 1999 were extremely dry and unusually cool in North Carolina with night temperatures in the lower 60's and 50's. Wet weather with mist and fog occurred during the week of June 14-19. Numerous reports about disease in cotton were received on June 18. Several fields were visited with consultants and county extension staff. In some instances the cotton stem was girdled causing the upper portion of the plant to wilt and die. Most likely, infection was favored by a combination of factors: the presence of juvenile plant tissue, low temperatures which damaged this tissue, and wet weather. The advent of warm dry weather prevented new infections, although the disease continued to progress on some infected plants.

The fungus was isolated and cultured on PDA. A suspension containing spores of *P. exigua* was sprayed on cotton leaves or injected into the stems to confirm pathogenicity. Inoculated plants were placed in 100% humidity for 72 hours. Two weeks after inoculation, injected stems had cankers similar to those observed in the field. Cotton leaves had lesions identical to those caused by *Ascochyta gossypii*.

Yield loss estimates related to cotton stem canker were difficult to assess. Crop consultants and county extension staff estimated disease incidence in individual fields from less than 1% to over 90%. In fields with more than adequate stands and only 1% to 5% of plants infected, the impact of the disease was minimal due to compensation. Cotton fields with a high incidence of stem canker probably matured late, which may have been beneficial due to the three hurricanes we experienced in 1999. Disease incidence did not appear to be affected by cotton cultivar, tillage, or crop rotation.

Summary

Measures to prevent this disease in the future are unlikely to be helpful. It appears that all cotton cultivars are susceptible to *P. exigua*, as are most if not all rotational crops. In-furrow fungicides would be unlikely to aid in control of the disease in mid-June, and no fungicides are labeled for foliar application to cotton in the southeast. This disease is not expected to be a major problem on future cotton crops, although minor losses may occur.

References

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