

**DETERMINATION AND CONTROL
OF COTTON BLACK ROOT**

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Abstract

During 1996 and 1997, two field studies were established at Appling and Berrien counties to evaluate four fumigants (chloropicrin (PIC 50), C-17, Telone II, and Vapam HL) and three fungicides (Rovral CF, Quadris EC, and Terraclor EC) for control of cotton black root. At each location, the effect of cotton black root on boll development and associated environmental conditions were determined. Boll development on 20 plants at both locations were mapped during three sampling dates. Results showed that flowers, squares, and immature bolls (1-20 days of development) aborted from the plants. Percent abortion, however, was directly dependent upon when symptoms of cotton black root initiate on the roots. The later the symptom development the greater the boll retention was observed. If bolls reaches full maturity, abortion did not occur, but lint quality was often lower and many bolls were tight-locked. In Appling county, cotton black root initiation occurred during square development and bloom. In Berrien county, disease initiation occurred approximately 30-days later. It is uncertain why disease initiation differed between the two sites especially since soil temperatures and moisture levels were similar. Results from the chemical control tests showed that the three fungicides had similar yields to the nontreated check plots at both locations. Only the fumigant chloropicrin (PIC 50) at 55 lb a.i./A had significantly greater yield than the nontreated check plot in Appling county. In Berrien county, chloropicrin at 55 lb a.i./A had the highest yield, but total lint per acre was not significantly greater than the nontreated check. The results with chloropicrin indicate that an organism (biotic factor) may be associated with cotton black root. To confirm the field results that a biotic factor was responsible for cotton black root, a greenhouse test was initiated using autoclaved and nonautoclaved soil (Leefield loamy sand). When the plants were lifted from the pots, roots from the autoclaved soils did not shown symptoms of cotton black root 70-days after planting, but several cotton roots from the nonautoclaved soil had typical cotton black root symptoms. The fungus, *Macrophoma* sp., was isolated only from the symptomatic roots. Previously *Macrophoma* sp. was identified from fields containing cotton black root in 1997, but initial greenhouse studies conducted during that year could not confirm pathogenicity.