EFFICACY OF STEROL-INHIBITING FUNGICIDES AND SAR CHEMICALS FOR CONTROL OF BLACK ROOT ROT OF COTTON IN THE ABSENCE AND PRESENCE OF NEMATODES

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Abstract

Sterol-inhibiting fungicides and systemic acquired resistance (SAR) chemicals have been reported to reduce black root rot in previous studies. Systhane (myclobutanil) and Baytan (triadimenol) have been utilized as cottonseed treatments for more than 10 years. However, these chemicals are often used at rates which have little efficacy for the control of black root rot. Bion (acibenzolar-S-methyl), one of the SAR chemicals, has been shown to induce resistance in cotton against *Thielaviopsis basicola*; even though the compound has no fungicidal activity against the pathogen. Bion is currently registered in Australia for the control of black root rot. In this study, efficacy of the Systhane and Bion for the control of black root rot of cotton was evaluated in both controlled environmental and field experiments by using naturally infested and artificially infested soils in the absence and presence of nematodes. In artificially infested experiments, root discoloration, caused by *Thielaviopsis basicola*, was significantly reduced by both Systhane and Bion. In naturally infested soil with a moderate *T. basicola* population (24 ppg), root discoloration also was reduced by both Systhane and Bion. However, Systhane, when used in combination with Bion, provided the best control. In naturally infested soil with a high *T. basicola* population (113 ppg) in the presence of the root-knot nematode, *Meloidogyne incognita*, Bion or Systhane did not significantly decrease root discoloration. However, plant development (number of nodes) was significantly improved with Systhane or Bion, indicating that even if root discoloration was not reduced, disease was still less severe**.** In field experiments, under high *T. basicola* and *M. incognita* populations, there were no significant differences among seed treatments containing Bion or Systhane. However, the incidence of black root rot (isolation of the pathogen) was much lower for seed treated with either Bion or Systhane or both, suggesting that Bion and Systhane are significantly reducing black root rot. Galling caused by the root-knot nematode was significantly reduced by Avicta and Temik in this study. Results indicate that sterol-inhibiting fungicides and SAR chemicals appear promising for the control of black root rot and promoting early season growth of cotton. These chemicals appear to be more effective at higher rates of application to the seed and at low to moderate populations of *T. basicola*.