NEMATODE MANAGEMENT IN THE MID-SOUTH T.L. Kirkpatrick University of Arkansas-Southwest Research and Extension Center Hope, AR

Abstract

Although only two species of nematodes are of economic concern in the mid-South on cotton, both species are widely distributed throughout the region. Both the root-knot nematode (Meloidogyne incognita) and the reniform nematode (Rotylenchulus reniformis) are common inhabitants of mid-South cotton fields, although currently rootknot is of greater concern in Arkansas, Tennessee, and the Missouri Bootheel while reniform nematodes pose the greatest risk to cotton in Louisiana, Mississippi, and western Alabama. Nematode control requires a planned multiyear strategy that includes both cultural and chemical tools. Unfortunately, while there are several effective new tools for managing weed and insect pests, nematode control still relies heavily on cultural strategies and annual nematicide application. A primary component of current cotton weed and insect management programs is the use of genetically modified cultivars that express high levels of herbicide and(or) insect resistance. Unfortunately, no transgenic cultivars exist that have traits that are effective in nematode control. Although a few mid-South-adapted cultivars are available with moderate levels of resistance to root-knot, there are currently no cultivars with resistance to R. reniformis. A similar situation exists with chemical nematicides. Only a few new products with good nematicidal efficacy have entered the marketplace in the last 25 years. Unfortunately, while some effective nematicides are still labeled for use in cotton, the recent suspension of Temik 15G by the manufacturer demonstrates the lack of chemical options and the vulnerability of those that exist in the marketplace today. Our current nematicide arsenal includes the soil fumigants 1.3-dichloropropene, metam sodium and metam potassium, a single non-fumigant granular material (aldicarb), a nematicidal carbamate that can be basipedally translocated if applied as a foliar application for supplemental control, and three seed-applied nematicides. In the mid-South, as in other areas, nematode management strategies begin with a knowledge of the nematode infestation level and the identity of the nematodes involved in each field. The most effective long-term management strategy has been planned crop rotation using non-host or resistant alternative crops to lower nematode population densities. The utility of this approach varies according to geographic location and cropping preference and depends on the nematode species of concern. For example in areas with high reniform nematode incidence, rotations that include corn, grain sorghum or rice have been very beneficial in lowering reniform nematode population densities the year prior to cotton. However, where the root-knot nematode is the problem, corn has been shown to exacerbate the nematode issue considerably by serving as a host for the nematode. In root-knot-infested fields, rotation with either grain sorghum or rice has been effective, but the economic practicality of grain sorghum and the soil type requirements for rice production limit the usefulness of this rotation scheme. The use of moderately resistant cultivars for fields with a potential root-knot nematode problem can aid considerably in minimizing yield losses, but where reniform is present, there are no cultivar options that will help. Combining strategies, such as the use of a nematicide combined with a moderately resistant cultivar in conjunction with a well-planned crop rotation program, is the most effective long-term solution to practical nematode management in cotton in the mid-South.