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COTTON



COTTON NEMATODE CONTROL

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Nematodes pose a serious threat to cotton production in South Carolina. Each year nematodes claim over 5% of the possible cotton production in South Carolina. Not every field is infested with damaging levels of nematodes. But, in the fields that are infested, yield losses probably range from barely detectable to over 50%. Table 1 shows the results from a recent cotton nematode survey for South Carolina. Over 90% of South Carolina cotton fields have at least one species of nematodes present in the field. Almost half of all fields have at least one of the species over damage threshold levels. Columbia lance nematode is the primary nematode pest in all areas of the state being present in almost 40% of all fields at damaging levels (Table 2). The incidence of fields with either root-knot or reniform nematodes at damaging levels is much lower (Table 2). Root-knot appears to be more severe in the Savannah Valley area, whereas reniform nematode is more severe in the Pee Dee region and has not been found in Aiken, Allendale, Bamberg, Barnwell, or Hampton counties. The nematode situation in each county is listed in Table 3.

Management tools for any of the three nematode species are limited. Use of deep tillage of some sort is useful in helping with managing all three species. Management tactics by species are as follows.

Columbia lance nematode management relies heavily on the use of nematicides. There are **no resistant or tolerant cultivars** available. **Crop rotation is of limited value** in South Carolina since corn and soybeans are hosts. Peanut is a good nonhost, however limited acreage in South Carolina makes this option limited in application. **Many weeds are hosts** for Columbia lance nematode making the fallowing of fields ineffective as a rotation strategy. The effects of planting date are unknown. Conservation tillage practices in general have little effect on Columbia lance nematode as long as some form of deep tillage is maintained. Most winter cover crops are hosts of this nematode and may increase populations of Columbia lance nematodes if the cover crop is planted prior to November and harvested after March. Cover crops planted after October and harvested prior to April will probably not affect nematode numbers since the nematode is inactive at low soil temperatures.

Root-knot nematode management is very similar to that of Columbia lance nematode in that it relies heavily on the use of nematicides. There are **no resistant or tolerant cultivars** available. Cultivars advertised as root-knot nematode or "nematode" resistant are usually resistant only to the Fusarium wilt-root-knot nematode complex. Stoneville's LA 887 does exhibit partial resistance to root-knot nematode, but it will still respond to the application of a nematicide in most root-knot nematode infested fields. Damage from the wilt fungus is rarely seen on modern cultivars, but even low levels of root-knot nematode can cause

severe yield losses on these cultivars. **Crop rotation is of limited value** in controlling root-knot nematode in South Carolina. Root-knot nematode will survive or build on corn without damaging the corn. Many soybean cultivars are resistant to root-knot nematode, however the widespread distribution of Columbia lance nematode limits this rotation since Columbia lance is very damaging to most soybean cultivars and most growers do not survey their fields. Peanut is a good nonhost, however limited acreage in South Carolina restricts this option. Many weeds are hosts for root-knot nematode making the fallowing of fields ineffective as a rotation strategy. The effects of planting date are unknown. Conservation tillage practices in general have little effect on root-knot nematode as long as some form of deep tillage is maintained. With the exception of 'Cahaba' vetch, most of legume winter cover crops are hosts of root-knot nematode and may increase populations if the cover crop is planted prior to November and harvested after March. Cover crops planted after October and harvested prior to April will probably not affect nematode numbers since the nematode is inactive at low soil temperatures. Rye may help decrease root-knot nematode numbers, however this is not well documented at the present time.

Reniform nematode management also relies heavily on nematicides. Reniform nematode is relatively new and very little data exists on its management compared to root-knot or Columbia lance nematodes. Resistance or tolerance to reniform nematode has not been well documented in commercially available cultivars. Some cultivars such as Stoneville's LA 887 may be partially tolerant to reniform nematode, however, it will still respond to the application of a nematicide. **Crop rotation is possible as a management tool** as corn, grain sorghum, and some soybean cultivars are resistant.

See Table 4 for rates of nematicides for controlling either Columbia lance, root-knot or reniform nematodes. Also observe the following guidelines.

- 1) Telone II should be applied 10-14 days prior to planting to avoid phytotoxicity. Telone II should be injected 8-14 inches under the row and covered with a bed. The addition of 3.5 lb Temik at planting may give some additional control.
- 2) Use NemaCur 15G at-planting in-furrow.
- 3) Rates of Temik 15G greater than 7.0 lb per acre applied in-furrow at-planting may result in phytotoxicity and should not be applied. Drill Temik 15G granules just below seed line or place in seed furrow and cover with soil. If the rate exceeds 7 lb/ac, apply granules in a 4- to 6-inch band and work into the soil or cover with soil; plant seed in or above the treated zone. See label for soil type and well set-back, and rotation crop restrictions in South Carolina.

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Table 1. Overview of Nematodes in South Carolina				
<i>Area</i>	<i>No. Fields Sampled</i>	<i>% Over Damage Threshold</i>		
		Columbia Lance	Root-knot	Reniform
Savannah Valley	303	39	13	1
Pee Dee	915	37	5	4
State Average	1218	37	7	3

Table 2. Percentage of Fields in South Carolina With Either Columbia Lance, Root-knot or Reniform Nematodes Present and Percentage Above Damage Threshold		
<i>Species</i>	<i>% Fields Present</i>	<i>% Fields Above Threshold</i>
Columbia Lance	61	31
Root-knot	25	7
Reniform	12	3

Table 3. Number of Fields Sampled Per County and Percentage of Fields with Nematode Species Above Threshold Levels, 1989-92

<i>County</i>	<i>No. Fields Sampled</i>	<i>% Over Damage Threshold</i>		
		<i>Columbia Lance</i>	<i>Root-knot</i>	<i>Reniform</i>
Aiken	13	15	0	0
Allendale	15	0	7	0
Bamberg	5	20	0	0
Barnwell	22	32	18	0
Calhoun	115	47	10	4
Clarendon	46	28	9	4
Darlington	184	45	9	0
Dillon	85	19	11	7
Florence	26	12	0	0
Hampton	20	0	30	0
Kershaw	16	44	6	0
Lee	247	35	2	6
Marlboro	149	60	3	1
Orangeburg	113	47	15	0
Sumter	93	30	4	4
Williamsburg	69	16	4	6

Table 4. Nematicides Available for Controlling Either Columbia Lance, Root-knot or Reniform Nematodes in South Carolina

<i>Common Name</i>	<i>Product Name</i>	<i>Rate</i>	<i>Application</i>
1,3-Dichloropropene	TELONE II	3-5 gal/ac	Preplant
Fenamiphos	NEMACUR 15G	8-12 oz/1,000 ft of row	In-furrow
	NEMACUR 3E	3.3-7.1 fl oz/1,000 ft of row	In-furrow
Aldicarb	TEMIK 15G	4-5-12 oz/1,000 ft of row	In-furrow

Application rates are for any row spacing.