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Effects of Crop Rotation and Nonfumigant Nematicides on Peanut and Corn Yields in Fields Infested with *Criconemella* Species[1]

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Abstract: The effects of nematicide treatments and corn–peanut cropping sequences on the population development of *Criconemella ornata,* and *C. sphaerocephala* and the related impact on crop yields were investigated at two North Carolina locations. *Criconemella ornata* and *C. sphaerocephala* were present at the Norman Perry farm, Bertie County (BERTIE); however, only *C. ornata* was found at the Central Crops Research Station, Johnston County (CCRS). An untreated control was compared to aldicarb 15G, carbofuran 15G, ethoprop 10G, and terbufos 15G granular formulations applied at a rate of 2.2 kg a.i./ha. The cropping sequences were monocultured corn (C-C-C); monocultured peanut (P-P-P); and two corn–peanut (C-P-C; P-C-P) rotations. Nematicides were inconsistent in controlling *C. sphaerocephala* and *C. ornata.* Nematicide treatments enhanced corn yields in the monoculture-cropping cycle in the final year of the experiment at CCRS. Peanut yields were greater in the rotated cropping sequence than under monoculture at BERTIE, but rotation had less effect on peanut yields at CCRS. Declining yields were correlated with an increase in numbers of nematodes. Corn was an intermediate host for *C. sphaerocephala* and a moderate to poor host for *C. ornata.* Peanut was an excellent host for *C. ornata* and a poor host for *C. sphaerocephala.*
Key words: *Arachis hypogaea,* cropping sequence, *Zea mays.*

Criconemella ornata (Raski) Luc & Raski can be pathogenic to peanut and occurs throughout most of the peanut-production area in North Carolina and in the southeastern United States (12). A negative correlation between peanut yields and population densities of *C. ornata* was shown for a field experiment where peanut was the previous crop, but no correlation was evident when corn was the previous crop (17). Peanuts supporting low to moderate numbers of this nematode often exhibited little damage under field conditions (16), whereas as few as 178 freshly introduced juveniles and adults per 500 cm^3 soil suppressed peanut growth and yields and induced the "peanut yellows" chlorosis in microplots (2) as described earlier by Machmer (10). In contrast, greater residual but apparently less vigorous specimens (1,348 *C. ornata*/500 cm^3 soil) following tobacco in microplots had no effect on a subsequent peanut crop (2). *Criconemella ornata* did not suppress growth of peanut in the absence of environmental stress under greenhouse conditions (2).

Corn, often rotated with peanut, is a host for *C. ornata,* but this nematode is a weak pathogen of corn (2,5). *Criconemella sphaerocephala* (Taylor) Luc & Raski reproduces on this crop (9), but there is little information on its biology and effects on yields.

Crop rotation is used by peanut and corn growers in North Carolina and other regions to minimize nematode and other pest problems (13–15). This tactic is the most economical approach to control where sufficient land is available; it also may improve soil structure and fertility (13). Rotation crops vary in their susceptibility and host efficiency to different nematode species, including *C. ornata.* Peanut is an efficient host for *C. ornata,* corn is an intermediate host, and soybean and tobacco are poor hosts (2). Intermediate hosts may maintain population levels of *C. ornata* and thereby be ineffective in a rotation.

Currently, the nonfumigant materials ethoprop (Mocap 15G), fenamiphos (Nemacur 15G), aldicarb (Temik 15G), and

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carbofuran (Furadan 15G) are recommended for nematode control on peanuts in North Carolina. Aldicarb has been shown to give less effective control of *Meloidogyne arenaria* (Neal) Chitwood on peanut than fumigant nematicides (15). Ethoprop, terbufos (Counter 15G), and carbofuran are labelled for use on corn. Results from nematicide experiments on field corn indicated that *C. ornata* increased to higher numbers at the end of the season in plots treated with carbofuran and ethoprop compared with other treatments and the control (5). Aldicarb was observed to give poor control of *C. ornata* on sweet corn (7), millet, and sorghum–sudangrass hybrids (6). Other species such as *C. xenoplax* (Raski) Luc & Raski on ornamentals also were not controlled with aldicarb, whereas 1,2,-dibromo-3-chloropropane (DBCP) was effective against this species (3).

Information on interactive effects of nematicides and crop rotation on selected nematodes on peanut and corn can be useful in determining beneficial and adverse management practices. A 3-year nematicide × corn–peanut rotation study was conducted to characterize the effects of aldicarb, carbofuran, ethoprop, and terbufos on the population dynamics of *C. ornata* and *C. sphaerocephala* in a corn–peanut crop rotation and to elucidate the role of nematicides and nematodes to production of these crops.

Materials and Methods

Two North Carolina field sites, a commercial farm in Bertie County (BERTIE) and the Central Crops Research Station (CCRS), were selected because of natural infestation of *C. ornata*. *Criconemella sphaerocephala* also was detected at BERTIE. Low population densities (mean numbers = < 50/500 cm^3 soil) of *Paratrichodorus minor* (Colban) Siddiqi, *Meloidogyne incognita* (Kofoid & White) Chitwood, *M. hapla* Chitwood, *Helicotylenchus* spp., *Xiphinema* spp., and *Pratylenchus* spp. and moderate population numbers of *Tylenchorhynchus claytoni* Steiner (mean numbers = 657/500 cm^3 soil) also were present at BERTIE.

Of the *Criconemella* species, only *C. ornata* was detected at the CCRS location (mean numbers = < 20/500 cm^3 soil). Low population densities (mean numbers = < 20/500 cm^3 soil) of *Meloidogyne* spp., *Pratylenchus* spp., *Helicotylenchus* spp., *P. minor,* and *Xiphinema* spp. and moderate population numbers of *T. claytoni* (mean numbers = 572/500 cm^3 soil) also were detected at this location.

The soil at BERTIE was a Goldsboro loamy sand (81% sand, 16% silt, 3% clay) and at CCRS a Fuquay sand (93% sand, 5% silt, 2% clay).

Four cropping sequences with corn (*Zea mays* L. cv. Pioneer Brand 3184) and peanut (*Arachis hypogaea* L. cv. Florigiant) were established in a random design at each location for each year of the study. The cropping sequences for 1981, 1982, and 1983 were continuous corn (C-C-C) and peanut (P-P-P) and two corn–peanut rotations (C-P-C; P-C-P). Before seeding the fields were disked and rows were bedded and leveled leaving an approximate 36–40-cm wide surface.

Experimental plots were four rows, 9.3 m long, and row widths were 0.93 m at BERTIE and 0.98 m at CCRS. Experimental plots were re-established in 1982 and 1983 in the same area of the field.

Soil samples for nematode assays and soil texture analyses were obtained by compositing 10–20 soil cores to give ± 500 cm^3 of soil from the two center rows of each plot. Samples were collected from each row with a 2.0-cm-d soil probe and stored in plastic bags in coolers. Nematodes were extracted by elutriation and centrifugation (1,4).

Granular formulations of aldicarb, carbofuran, ethoprop, and terbufos were applied to all four rows of each treatment plot at a rate of 2.2 kg a.i./ha. A Gandy applicator (Gandy Co., Owatonna, MN 55060) dispersed these chemicals in 36-cm bands centered over the rows which were then incorporated with a tilrovator (Ferguson Mfg. Co., Suffolk, VA 23434) set to operate at a depth of 5–8 cm. Control plots also were rotovated. Chemical treatments and the controls were arranged in a randomized complete block design within each cropping sequence. All treatments were replicated six times. Nematode and plant data were taken from the two center rows of each plot.

Peanuts received a *Bradyrhizobium* spp. inoculant (Nitragin) at the recommended rate. Standard practices for planting, fertilizing, cultivating, disease, weed, and insect control were employed. In 1981 only, aldicarb was added in the furrow of peanut plots at a rate of 0.5 kg a.i./ha for insect control by the grower at BERTIE. Corn and peanuts were irrigated at CCRS as needed, but irrigation was not available at BERTIE.

The two center rows of each corn plot were hand harvested for yield data. A 4.5-kg subsample was randomly taken at each location and shelled and moisture was determined. Yields were converted to shelled grain weights (kg/ha, 15.5% moisture). The two center rows of each peanut plot were harvested with a commercial combine. A 4.5–10.0-kg subsample of peanuts was randomly taken at each location. Moisture was determined by drying the peanuts to a constant dry weight in a forced air oven or drying bin. Yields were converted to kilograms per hectare on a dry weight basis.

BERTIE: Corn was planted on 8 April 1981, 8 April 1982, and 28 April 1983 at respective plant populations of 5.7, 5.0, and 5.0 × 10^4/ha. Nematode samples were taken at planting (Pi), midseason (Pm), and harvest (Pf) in 1981 and 1982. Midseason sample dates were 24 June 1981 and 22 June 1982. Nematode samples were taken at planting and at 6-week intervals (Pm1 and Pm2) until harvest in 1983. Respective harvest dates were 17, 24, and 30 August.

Peanuts were planted on 4 May 1981, 10 May 1982, and 2 May 1983 at a seeding rate of 135 kg/ha each year. Plant densities were 3.8, 3.4, and 4.0 × 10^4/ha for 1981, 1982, and 1983, respectively. Nematode samples were taken at planting (Pi), and midseason samples were taken 10 July 1981 and 3 August 1982. In 1983, three midseason samples (Pm1, Pm2, and Pm3) were taken at 6-week intervals until harvest.

CCRS: Corn was planted 15 April 1981, 16 April 1982, and 27 April 1983 at respective plant populations of 4.9, 5.4, and 5.4 × 10^4/ha. Nematode samples were taken as described for BERTIE. Midseason samples were taken 25 June 1981, 24 June 1982. Midseason samples were taken at 6-week intervals (Pm1 and Pm2) until harvest in 1983.

Peanuts were planted 1 May 1981, 13 May 1982, and 4 May 1983 at respective plant populations of 4.1, 4.0, and 4.0 × 10^4/ha. Nematode populations were sampled as described. Midseason sample dates for 1981 and 1982 were 10 July 1981 and 6 August 1982, respectively. Midseason samples in 1983 were taken at 6-week intervals (Pm1, Pm2, and Pm3) until harvest. Harvest dates for these experiments were 13 October, 29 September, and 19 October.

Data collection and analysis: Data obtained from these experiments included plant stand counts, grain yields and pod weights, and nematode population densities. All data were subjected to an analysis of variance. Treatment–mean comparisons were made with contrast analyses. An analysis of variance of data combined across replications, treatments, years, and rotations for each crop was performed to determine interactions between these parameters. Correlation analyses were utilized to determine the relationships between nematode numbers, transformed to $\text{Log}_{10}(X + 1)$, and plant yields. Regression analyses were used to relate the effects of nematodes to yield.

RESULTS

Cropping sequence effects on yield: Rotation had significant effects on peanut and corn yields at the BERTIE location as rotated peanut yields were greater than those of monocultured peanut in 1982 and 1983 (Tables 1–3). In 1983, peanut yields following corn in the P-C-P cropping sequence were almost double those of the

TABLE 1. Peanut yield (kg/ha) at Central Crops Research Station (CCRS) and Norman Perry farm, Bertie County (BERTIE).

	Crop rotation sequence					
	P-P-P			P-C†-P		C†-P-C†
Treatment	1981	1982	1983	1981	1983	1982
			CCRS			
Aldicarb	4,484	4,560	3,388	4,713	3,719	4,356
Carbofuran	4,560	4,356	3,235	4,535	3,872	4,050
Ethoprop	4,662	4,535	3,108	4,840	3,643	4,305
Terbufos	4,764	4,840	3,337	4,815	3,388	4,280
Control	4,764	4,535	3,083	4,662	3,567	4,330
Contrasts‡	NS	NS	NS	NS	b	NS
			BERTIE			
Aldicarb	6,060	3,071	1,848	5,598	3,397	3,967
Carbofuran	6,195	3,288	1,440	5,190	3,071	4,266
Ethoprop	5,625	2,310	1,386	5,244	3,234	4,076
Terbufos	5,625	2,663	1,902	5,272	2,636	4,293
Control	5,761	2,310	1,549	5,353	3,234	3,994
Contrasts‡	b	b	NS	NS	d	NS

P = peanut and C = corn; P-P-P, P-C-P, and C-P-C are cropping sequences. Data are means of six replicates.
† Year(s) planted in corn as the rotational crop.
‡ Capital letters indicate differences at $P = 0.01$ and lower case at $P = 0.05$ for contrast analyses. A, a = nematicides vs. control; B, b = aldicarb, carbofuran vs. ethoprop, terbufos; C, c = aldicarb vs. carbofuran; D, d = ethoprop vs. terbufos.

monocultured crop in 1983. Peanut yields, however, declined over years in both rotated and monocultured cropping sequences.

The crop-rotation effects were significant at CCRS (Tables 1, 3) but had less impact on peanut yields than at BERTIE. Yields following corn were slightly higher than the monocultured crop in 1983 (Table 1).

TABLE 2. Corn yields (kg/ha) at Central Crops Research Station (CCRS) and Norman Perry farm, Bertie County (BERTIE).

	Crop rotation sequence					
	C-C-C			C-P†-C		P†-C-P†
Treatment	1981	1982	1983	1981	1983	1982
			CCRS			
Aldicarb	4,789	7,452	5,307	4,611	5,685	8,139
Carbofuran	4,863	7,709	4,650	4,227	5,455	7,795
Ethoprop	4,700	7,452	5,077	4,242	4,666	7,057
Terbufos	5,010	8,911	5,241	4,951	5,471	7,950
Control	5,099	8,018	4,354	4,331	4,748	7,675
Contrasts‡	NS	d	a	d	NS	NS
			BERTIE			
Aldicarb	9,424	10,998	6,086	9,441	6,273	13,230
Carbofuran	9,932	10,856	6,198	9,780	6,367	13,105
Ethoprop	8,392	11,246	5,545	9,763	6,647	13,035
Terbufos	9,847	11,582	6,367	9,814	6,889	12,521
Control	10,423	11,352	6,871	10,084	6,591	13,088
Contrasts‡	NS	NS	a	NS	B	b, d

C = corn and P = peanut; C-C-C, C-P-C, and P-C-P are cropping sequences for 1981, 1982, and 1983. Data are means of six replicates.
† Year(s) planted in peanut as the rotational crop.
‡ Capital letters indicate differences at $P = 0.01$ and lower case at $P = 0.05$ for contrast analyses. A, a = nematicides vs. control; B, b = aldicarb, carbofuran vs. ethoprop, terbufos; C, c = aldicarb vs. carbofuran; and D, d = ethoprop vs. terbufos.

TABLE 3. Analysis of variance for interactive effects of nematicide treatment, rotation, and years on peanut and corn yields at BERTIE and CCRS locations.

	Peanut						Corn					
	BERTIE			CCRS			BERTIE			CCRS		
Source of variation	df	Mean squares	Prob > F	df	Mean squares	Prob > F	df	Mean squares	Prob > F	df	Mean squares	Prob > F
Replication (REP)	5	36.99	0.0001	5	8.06	0.008	5	166.52	0.001	5	53.89	0.103
Treatment (TRT)	4	6.14	0.3045	4	1.08	0.78	4	46.31	0.196	4	105.37	0.007
Year	2	2,252.28	0.0001	2	328.72	0.001	2	11,325.41	0.001	2	2,116.61	0.001
TRT × year	8	3.41	0.7105	8	2.48	0.466	8	33.21	0.368	8	34.18	0.311
Rotation (ROT)	2	243.36	0.0001	2	21.36	0.003	2	796.27	0.001	2	16.54	0.564
TRT × ROT	8	5.88	0.3212	8	1.15	0.881	8	46.25	0.152	8	26.03	0.515
Year × ROT	1	410.70	0.0001	1	10.52	0.041	1	4.56	0.698	1	153.68	0.223
TRT × year × ROT	4	6.52	0.2736	4	1.65	0.617	4	5.63	0.945	4	20.40	0.587

Data are analyzed for the years 1981, 1982, 1983.

Yields of rotated corn were greater than those of the monocultured crop at BERTIE in 1982; however, there were only slight differences between cropping sequences in 1983 (Tables 2, 3). Corn yields were greater in 1982 than in 1981 or 1983.

At the CCRS location, crop rotation did not enhance corn yields in 1982 or 1983 (Tables 2, 3). Generally, yields were greatest in the 1982 growing season.

Nematicide effects on yield: Nematicides did not enhance peanut yields at either location, compared with the control treatments (Table 1). Monocultured peanut yields at BERTIE were greater with the carbamate materials (aldicarb and carbofuran), however, than with the organophosphate (ethoprop and terbufos) nematicides in 1981 and 1982.

Corn yields were not increased with any nematicide at BERTIE; however, nematicidal treatments increased corn yields, compared with those of the controls, in the monocultured crop at CCRS in 1983.

Effects of C. ornata and C. sphaerocephala on crop yields as related to crop rotation and nematicides: Nematodes had negative but variable effects on yields at CCRS. Monocultured peanut yields were inversely related with the initial ($r = -0.43$, $P = 0.03$) and 12-week (Pm2) population densities ($r = -0.40$, $P = 0.04$) of *C. ornata* in 1983. Based on linear regression models, there was a 6% yield loss for each 10-fold increase in nematode numbers (Table 4). There was no significant association with yield loss and this nematode in the rotated cropping sequences. Numbers of *C. ornata* at BERTIE were not correlated with yield loss of peanut in any of the cropping sequences (Table 4).

Criconemella ornata caused slight damage to corn in the C-C-C cropping sequence at CCRS in 1981. Linear regression analyses between midseason (Pm) population numbers and yields indicated an 8% crop loss with each 10-fold increase in nematode numbers (Table 4). Nematodes were not associated with corn yield losses in any of the cropping sequences or year at BERTIE.

TABLE 4. Statistically significant regression equations of corn and peanut yields (kg/ha) as affected by different population densities of *Criconemella ornata* and *C. sphaerocephala* at the Norman Perry farm, Bertie County (BERTIE), and *C. ornata* at the Central Crops Research Station (CCRS).

Location	Year	Cropping sequence	Host and sample time†	Regression equation‡		
BERTIE	1981			NS (nonsignificant)		
	1982			NS		
	1983	C-P-C	Corn, Pi	Yield = 5,254 + 519X	$R^2 = 0.24$	$P = 0.01$
			Corn, Pm1	Yield = 5,624 + 392X	$R^2 = 0.22$	$P = 0.01$
			Corn, Pm2	Yield = 4,899 + 516X	$R^2 = 0.24$	$P = 0.01$
		P-P-P	Peanut, Pi	Yield = −717 + 730X	$R^2 = 0.26$	$P = 0.01$
			Peanut, Pm1	Yield = −1,122 + 859X	$R^2 = 0.22$	$P = 0.01$
CCRS	1981	C-C-C	Corn, Pm	Yield = 5,041 − 403X	$R^2 = 0.17$	$P = 0.02$
	1982			NS		
	1983	P-C-P	Peanut, Pm2	Yield = 2,927 + 279X	$R^2 = 0.15$	$P = 0.04$
			Peanut, Pm3	Yield = 2,611 + 319X	$R^2 = 0.16$	$P = 0.03$
		P-P-P	Peanut, Pi	Yield = 3,712 − 221X	$R^2 = 0.19$	$P = 0.03$
			Peanut, Pm2	Yield = 3,972 − 255X	$R^2 = 0.16$	$P = 0.04$

C = corn and P = peanut; C-C-C, C-P-C, P-C-P, and P-P-P are cropping sequences for 1981, 1982, and 1983.
† Pi, Pm, and Pf = initial, midseason, and final population densities, respectively, for 1981 and 1982. Pi, Pm1, Pm2, Pm3, and Pf = nematode population densities at planting, 6 weeks, 12 weeks, 18 weeks, and harvest, respectively, for 1983.
‡ Regression analyses were performed across treatments within each cropping sequence (30 observations).

Population development of nematodes as affected by crop rotation and nematicides: The effects of the monocultured and rotated corn–peanut cropping sequences on nematode reproduction varied with each *Criconemella* species at BERTIE. Peanut was an efficient host for *C. ornata* (Fig. 1), but *C. sphaerocephala* was detected rarely on this crop. Population densities of *C. ornata* rapidly increased on monocultured peanut from 1981 to 1983. Mixed population numbers of *C. ornata* and *C. sphaerocephala* were high on monocultured corn in each year at BERTIE (Fig. 1). Because of difficulty in delineating juveniles of the two species, numbers are reported as a mixed population. *Criconemella sphaerocephala* was detected in this cropping sequence more frequently than in the rotated corn.

Nematode population densities were less at CCRS than at BERTIE. By the final year of the experiment, moderate numbers of *C. ornata* were found on monocultured and rotated peanut (Fig. 2). Corn was a poor host for *C. ornata* at this site. Nematode numbers did not increase on this host in any of the years of the experiment (Fig. 2).

Chemical control of *C. ornata* and *C. sphaerocephala* was erratic on both crops. Most of the data indicated that the nematicides tested were ineffective against these nematodes.

Discussion

Crop rotation had a greater impact on crop yields at BERTIE than at the CCRS. This greater yield response in rotated peanut at BERTIE apparently was due to a combination of factors. Nematode numbers and other problems (data not included here) such as incidence of *Cylindrocladium crotalarie* (Loos) Bell & Sobers and weed infestation were greater in the monocultured cropping sequence than in the rotated crop. Rotational effects were significant when peanut yield data were combined across rotations, nematicide treatments, and years. It was more difficult to manage pest problems on this farm location than at CCRS. Rotation had less effect on peanut yields at CCRS where other pests and diseases were not a problem. These results confirm the principle that the potential effectiveness of crop rotation is greatest in fields where various problems coexist for a susceptible crop such as peanut (13).

The nematicides tested were not effective in enhancing crop yields or in controlling nematode reproduction. Failure of

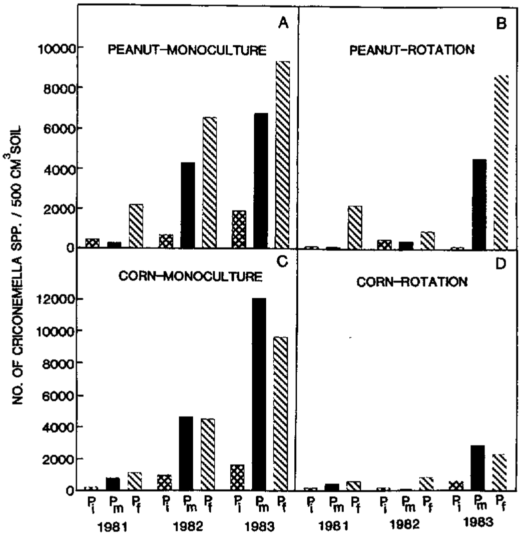

FIG. 1. Initial (Pi), midseason (Pm) and final (Pf) population densities (mean numbers for all treatments) of *Criconemella ornata* and *Criconemella sphaerocephala* on peanut and corn at the Norman Perry farm, Bertie County. A, B) Predominant species on peanut, *Criconemella ornata.* C) Predominant species on monocultured corn, *Criconemella sphaerocephala.* D) Both species present on rotated corn. Various cropping systems given in Tables 1, 2.

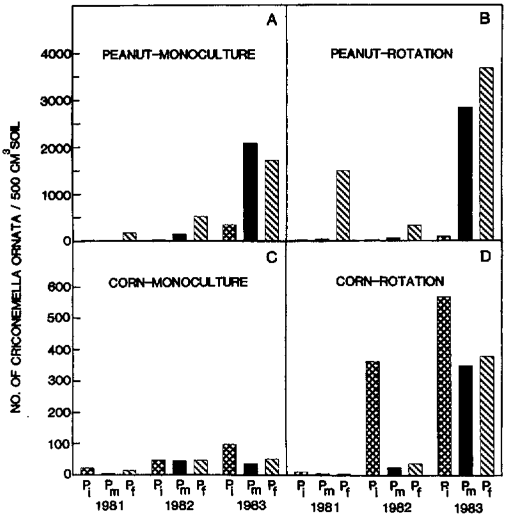

FIG. 2. Initial (Pi), midseason (Pm) and final (Pf) population densities (mean numbers for all treatments) of *Criconemella ornata* on peanut and corn at the Central Crops Research Station. Various cropping systems given in Tables 1, 2.

the nematicides to improve crop yields apparently was related in part to poor nematode control. Possibly, however, the nematode populations encountered in these experiments were not sufficiently severe to give a positive response to the compounds tested. Nematicides, especially fumigant materials, have been effective in increasing peanut and corn yields in fields infested with aggressive nematodes such as *Belonolaimus longicaudatus* and *M. arenaria* Rau (5,14,16,17). *Criconemella ornata* generally has been considered to be an important pathogen on peanut and a minor problem on corn (2,5,11,17). Nevertheless, difficulties in obtaining significant growth and yield responses of peanut and corn in sites where this nematode is present have been encountered in previous studies (5,16). Continued use of nematicides is a costly practice for growers when they fail to obtain measurable yield increases.

The slightly detrimental effects of *C. ornata* on crop yields indicated that these parasites are weak pathogens of peanut and corn. The relationships between population densities of *C. ornata* and peanut yields at CCRS were adequately described by linear regressions. Although damage was assessed statistically with a 6% loss in yield for each 10-fold increase in nematode numbers, combining these losses with those induced by other nematodes detected at these locations would overestimate the total loss due to *Criconemella* spp. More likely, all species together are contributing to an approximate 6% loss with each 10-fold increase in nematode numbers. Data from the CCRS experiment agree with results from previous work in that *C. ornata* caused damage only in monocultured peanut, but peanut following corn was not affected by prevalent levels of this nematode (17). A continuous cropping system of an efficient host may be required to build up population numbers of a weak pathogen such as *C. ornata* to damaging levels.

Nematode diversity and levels were influenced by the corn–peanut rotation cycles, as has been noted in other related studies (8,9). Data from these investigations confirm results from previous investigations that established peanut as a more efficient host than corn for *C. ornata* (2).

Criconemella sphaerocephala, in contrast, was detected on corn but rarely on peanut at BERTIE. A previous rotation study in Florida indicated that corn was the better host for *C. sphaerocephala* and peanut was a more efficient host for *C. ornata* (9).

There are no previous reports of *C. sphaerocephala* on corn in North Carolina, but it was detected on cotton by Steiner in 1938 (18). Greenhouse experiments with monospecific populations of *C. sphaerocephala* supported field results that this nematode reproduced on corn but not on peanut (Ayers, unpubl.). The coexistence of two *Criconemella* species increases the difficulty for nematode advisory programs in providing advice for effective nematode management on peanut. Nematode problems may be overestimated for peanut for two reasons. First, including *C. sphaerocephala* with *C. ornata* inflates the inoculum potential for peanut. Second, nematode assays following poor hosts for *C. ornata* may include counts of nonviable specimens (2).

Results from these experiments indicate that *C. ornata* and *C. sphaerocephala* had limited impact on corn and peanut production. This conclusion does not eliminate the possibility that fumigant nematicides would have given sufficient control of *C. ornata* to give a positive growth response of peanut. Both *C. ornata* and *C. sphaerocephala* reproduce on corn, but the latter species does not reproduce on peanut. The potential value of crop rotation in managing these nematodes and other pests was shown. Information from this investigation should be useful for making effective nematode management decisions on peanut and corn and thereby limiting the use of costly control tactics to situations where warranted.

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