Table 3. Reaction of experimental sweet corn hybrids to northern leaf blight at full silk and maturity as compared to the hybrid 'Bellringer' in a field trial.

Experimental hybrid no.	Disease severity rating[z] Full silk	Maturity	Seed source
Bellringer	2.3 a[y]	4.2 a	Harris
XP362	1.0 c	3.0 c	Asgrow
XP2527	1.3 bc	3.3 bc	Asgrow
Harris-1	2.0 ab	3.7 ab	Harris
Harris-2	1.7 abc	2.8 c	Harris
Harris-3	2.0 ab	3.2 bc	Harris

[z]Ratings based on a scale of 0 to 5 with 0 = no disease and 5 = most severe symptoms.
[y]Values followed by the same letter do not differ significantly at the 5% level by the Duncan's Multiple Range test.

NN14B and NN14 were 3.2 and 0.5, respectively. This indicates that possibly a third race of *H. turcicum* capable of overcoming resistance conferred by the *Ht2* gene is present in the natural population. Smith (6) recently reported on a race of *H. turcicum* that was virulent on corn lines carrying the *Ht2* and *Ht3* genes. Furthermore, race 3 is reported to be avirulent on genotypes carrying the *Ht1* gene (6). In the present study susceptible lesions were found on both NN14 and NN14B but to a higher degree on NN14B. Therefore, further tests are needed to establish the indentification of the race attacking NN14 and NN14B in Florida.

The findings from this study indicate that NCLB may be a difficult disease to control through breeding because of the development of new races of the pathogen which can overcome single gene resistance. For this reason development of hybrids with polygenic resistance may be a better approach to controlling NCLB in the future.

Table 4. Reaction of five corn genotypes to northern corn leaf blight at full silk and maturity in a field trial and sporulation rating of incubated lesions.

Genotype	Disease severity rating[z] Full silk	Maturity	Sporulation[y] rating
Oh 43 *Ht1 Ht1*	1.0 a[x]	3.2 a	2.6 a
NN14B *Ht2 Ht2*	0.3 b	3.2 a	0.4 b
NN14 *Ht1 Ht1 Ht2 Ht2*	0.3 b	0.5 b	0.4 b
K64 *HtN* bc4	0.0 c	0.0 c	0.0 b
BS8 74:260[v]	0.0 c	0.0 c	0.4 b[w]

[z]Ratings based on a scale of 0 to 5 with 0 = resistant type lesions only or no disease and 5 = severe disease.
[y]Degree of sporulation based on a scale of 0 to 5 with 0 = no spores and 5 = abundant spores.
[x]Values followed by the same letter do not differ significantly at the 5% level by the Duncan's Multiple Range test.
[w]Very limited sporulation noted in some resistant lesions.
[v]Genotype unknown.

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NEMATODES ASSOCIATED WITH SWEETPOTATO AND EDIBLE AROIDS IN SOUTHERN FLORIDA[1]

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Abstract. **Nematode population buildup over a 6-month period on three cultivars of white-fleshed sweetpotato—'Morado', 'Picadita', and 'White Triumph'—was compared with that on 'Carver', an orange-fleshed cultivar.** Rotylenchulus reniformis **built up to very high levels on all cultivars tested, reaching populations of 228 to 408/100cm³ of soil. Significantly (P=0.05) higher numbers of** Helicotylenchus dihystera **built up on 'Morado' and 'White Triumph' than on 'Carver' after 6 months, while significantly (P=0.05) lower numbers of** Quinisulcius acutus **occurred on 'Morado' than on 'Carver' at that time. Despite these differences, populations of all three nematodes had multiplied several times on all cultivars over the 6 month test period. Nematode samples collected from two genera of edible aroids revealed extremely high populations of** R. reniformis, **averaging 556/100 cm³ of soil for** Colocasia **spp. and 528/100 cm³ for** Xanthosoma **spp. Other plant parasites associated with these crops included** H. dihystera, Q. acutus **and** Meloidogyne javanica.

Important subtropical root crops grown in southern Florida include the boniato, or white-fleshed sweetpotato (*Ipomoea batatas* L.) and edible aroids (*Colocasia* spp. and *Xanthosoma* spp.). Approximately 3645 ha were planted to these crops in 1978 (9). Little is known of the nematode problems on these crops in southern Florida. Root knot nematodes (*Meloidogyne* spp.) have been reported on *Colocasia* spp. and *Xanthosoma* spp. in various parts of the world (2, 3, 5, 8, 10), and high numbers of *Rotylenchulus reniformis* Linford and Oliveira were found associated with *X. sagittifolium* in Trinidad (3). Previous work on nematode damage to the sweetpotato by *Meloidogyne* spp. and

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R. reniformis has been reviewed (8). The latter nematode is associated with several crops in southern Florida (7), but a previous test (6) of sweetpotato varietal response to *R. reniformis* did not include any of the white-fleshed cultivars commonly grown in southern Florida. This study examines nematode buildup on several locally grown white-fleshed cultivars and compares it with that of an orange-fleshed cultivar. A preliminary investigation of the nematodes associated with the edible aroids in Florida is also included.

Materials and Methods

Sweetpotato. Six cultivars and selections of sweetpotato were monitored for nematode buildup during 1979. These included the orange-fleshed cultivar 'Carver', the white-fleshed cultivar 'Morado', and two clonal selections each from the white-fleshed cultivars 'Picadita' and 'White Triumph'. Cuttings which had been rooted in nematode-free vermiculite were transplanted in raised beds on a Rockdale fine sandy loam soil in Homestead, Florida, on March 5, 1979. Prior to transplanting, Dacthal® at 6.7 kg/ha and fertilizer (12-12-18) at 896 kg/ha had been applied to the beds. The 6 cultivars and selections were arranged in a randomized complete block design with 5 replications of 5 cutting each. Distance between cuttings was 30.5 cm, and overhead irrigation was applied as needed. The plantings were periodically trained to prevent vines from one cultivar from growing into and rooting in the area occupied by another cultivar. All plots were sampled for nematodes on 3-5-79, 5-8-79, 7-8-79, and 9-4-79. Each soil sample consisted of soil collected with a hand trowel from the rhizosphere to a depth of 15 cm from 8 locations in a given plot of 5 plants.

Aroids. A collection of aroids planted at the Agricultural Research and Education Center in Homestead was sampled for nematodes on January 13, 1979. Individual soil samples were collected from the root zones of 8 accessions of *Colocasia* spp. and from 8 accessions of *Xanthosoma* spp.

Processing of samples. Each soil sample was passed through a 4 mm^3 sieve to remove rock, and a 100 cm^3 subsample was then processed by decanting and sieving followed by suspension of the residues in modified Baermann funnels (1, 4). Data from the sweet potato plots were analyzed by analysis of variance and Duncan's new multiple range test.

Results and Discussion

Sweetpotato. Initial numbers of nematodes found in the sweetpotato plots at the time of planting averaged 48.0/100cm^3 of soil for *Rotylenchulus reniformis,* 7.2/100cm^3 for *Helicotylenchus dihystera* (Cobb) Sher, and 1.2/100cm^3 for *Quinisulcius acutus* (Allen) Siddiqi. The populations of these nematodes on the subsequent three sampling dates are shown (Table 1). Numbers of *R. reniformis* had increased to very high levels on all cultivars after 4 and 6 months. There were no significant differences among the cultivars in *R. reniformis* populations.

Populations of *H. dihystera* also increased in soil around all cultivars. After 4 months, numbers were significantly ($P = 0.05$) greater on 'Morado' than on 'Carver' or either of the two 'Picadita' selections. By 6 months, numbers on the 'Picadita' selections had increased to a point where they were not significantly different from those on 'Morado'. Numbers on 'Carver' remained significantly lower than those on 'Morado' or on either of the 'White Triumph' selections. Numbers on the latter had increased greatly during the previous 2 months, and were also significantly greater than the numbers on one selection of 'Picadita'. In comparing numbers of *H. dihystera* on 'Carver' to those on the white-fleshed cultivars, no significant differences from the 'Picadita' selections were found. However, significantly higher numbers occurred on 'Morado' after 4 and 6 months, and on both 'White Triumph' selections after 6 months than on 'Carver'.

Populations of *Q. acutus* did not show significant differences among cultivars until 6 months after planting. At that time, populations on 'Carver' were significantly greater than numbers on 'Morado' or on one of the 'White Triumph' selections. Between 4 and 6 months after planting, numbers of *Q. acutus* had declined on all white-fleshed cultivars, but not on 'Carver'. In contrast, numbers of *H. dihystera* had increased on all cultivars during this time period. In cases where more than one selection of a white-fleshed cultivar was tested, no significant differences in nematode populations were apparent between selections of the same cultivar.

Ratios between final populations (P_f) and initial populations (P_i) for the three common plant parasitic nematodes in the sweetpotato plots indicate that the populations of all nematodes multiplied several to many times on all sweetpotato cultivars studied (Table 2). It is apparent that the white-fleshed cultivars tested are excellent hosts for these nematodes in all cases, even though buildup of some species may be somewhat slower on certain cultivars.

Table 1. Mean numbers of nematodes per 100 cm^3 of soil associated with sweetpotato cultivars on 3 sampling dates.

	Sampling dates		
	5-8-79	7-8-79	9-4-79
Rotylenchulus reniformis			
Carver	24 a[z]	238 a	228 a
Morado	13 a	473 a	245 a
Picadita, selection #1	20 a	634 a	408 a
Picadita, selection #2	13 a	378 a	338 a
White Triumph, selection #1	17 a	377 a	338 a
White Triumph, selection #2	24 a	428 a	299 a
Helicotylenchus dihystera			
Carver	2 a	19 a	70 a
Morado	2 a	138 b	445 bc
Picadita, selection #1	0 a	38 a	317 abc
Picadita, selection #2	5 a	29 a	121 ab
White Triumph, selection #1	8 a	86 ab	617 c
White Triumph, selection #2	5 a	78 ab	496 c
Quinisulcius acutus			
Carver	0 a	24 a	32 b
Morado	1 a	52 a	10 a
Picadita, selection #1	1 a	60 a	17 ab
Picadita, selection #2	2 a	36 a	16 ab
White Triumph, selection #1	8 a	48 a	11 a
White Triumph, selection #2	2 a	48 a	22 ab

[z]Mean of five replications. Means in columns followed by the same letter are not significantly ($P = 0.05$) different, according to Duncan's new multiple range test.

Table 2. Ratio of mean final population (P_f) to mean initial population (P_i) of 3 nematodes from soil around sweetpotato cultivars.

	Nematode		
Cultivar	*Rotylenchulus reniformis*	*Helicotylenchus dihystera*	*Quinisulcius acutus*
Carver	4.8	9.7	27.0
Morado	5.1	61.8	8.0
Picadita, selection #1	8.5	44.0	14.0
Picadita, selection #2	7.0	17.0	13.0
White Triumph, selection #1	7.1	85.7	9.0
White Triumph, selection #2	6.2	57.4	18.0

Table 3. Nematodes associated with two genera of edible aroids.

	Colocasia spp.	*Xanthosoma* spp.
Helicotylenchus dihystera	1[z]	2
Meloidogyne javanica	11	9
Quinisulcius acutus	4	0
Rotylenchulus reniformis	556	528
Total Nematodes[y]	784	732

[z]Mean number of nematodes per 100 cm^3 of soil found in association with 8 accessions of each genus.
[y]Including non-parasitic forms.

Aroids. Plant parasitic nematodes found associated with the edible aroids included *H. dihystera, Meloidogyne javanica* (Treub) Chitwood, *R. reniformis,* and *Q. acutus.* Mean numbers of nematodes per $100cm^3$ of soil for 8 samples each from *Colocasia* spp. and *Xanthosoma* spp. are shown (Table 3). Numbers of *R. reniformis* were extremely high in soil samples from both aroid genera, and comprised a majority of all nematodes (including non-parasitic forms) found on both *Colocasia* (71%) and *Xanthosoma* (72%). Examination of roots of both *Colocasia* spp. and *Xanthosoma* spp. from the sampling sites revealed occasional galls and mature females of *M. javanica* and large numbers of gravid females of *R. reniformis.* Females of the latter species would frequently be found in clusters of several individuals attached near the same point along the root.

Since high numbers of *R. reniformis* were found associated with all of the root crops evaluated here, it is important to consider this nematode when following these crops with other susceptible hosts. In addition, *H. dihystera* and *Q. acutus* can build up to high levels on the white-fleshed sweetpotato. The impact of these nematodes, particularly *R. reniformis,* on sweetpotato and edible aroids in southern Florida needs to be further investigated to determine if efforts to reduce their numbers on these crops are desirable.

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