REACTIONS OF SOME CONFECTIONERY GROUNDNUT ACCESSIONS TO PLANT PARASITIC NEMATODES INFECTION

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ABSTRACT

Investigations were conducted at four locations in Ghana during 2011 growing season to evaluate some confectionery groundnut accessions reactions to plant parasitic nematodes infection. Sixteen groundnut accessions were evaluated at Fumesua, Wenchi, Ejura and Atebubu in a 4 x 4 lattice design with three replications. Seeds were sown in four-row plots, five metres long at spacing of 50 cm between and 20 cm within rows. Plant parasitic nematodes populations per 200 cm^3 soil, days of groundnut to 50% anthesis, days to maturity, pods/plant and pod yield were analyzed using GenStat statistical package. Three accessions; ICGV97040, ICGV97051 and ICGV97058 significantly ($P < 0.05$) reduced nematodes populations by (92, 94 and 79%), (92, 89 and 97%) and (86, 79 and 100%) in Meloidogyne arenaria, Pratylenchus brachyurus and Aphelenchoides arachidis compared with ICGV97045, ICGV97047 and ICGV97049 respectively at Wenchi. ICGV97051 which yielded the highest (3.2 t/ha) was approximately 97% higher than ICGV97061 (0.1 t/ha) the lowest yielding accession. ICGV97051 was identified as the most promising accession on account of high yielding and nematode suppression potential.

Keywords: *Aphelenchoides arachidis, Arachis hypogaea, Meloidogyne arenaria, Pratylenchus brachyurus, Rotylenchulus reniformis, Scutellonema bradys*.

INTRODUCTION

Agriculture is the mainstay of Ghana's economy with about 60% of the rural folks depending on it for their livelihood. One of the most economic and versatile crops cultivated in the country is groundnut, *Arachis hypogaea* L. The leguminous crop has been listed as one of the 20 crop plants that stand between man and starvation (Wittwer, 1981). The seed is rich in calories and contains 25% protein. Groundnut may be boiled, roasted, fried, ground into paste or crushed for oil (Dickson and De Waele, 2005). Oil extraction also produces a protein-rich by-product that may be used for human consumption if processed from an edible grade groundnut; otherwise it is used for livestock feed (Dickson and De Waele, 2005). Besides the nutrition potential, groundnut has tremendous health benefits. Eating groundnut lowers a person's risk of weight gain, promotes heart health, prevents certain cardiovascular diseases, reduces risk of coronary and Alzheimer's diseases and lowers cholesterol in the blood stream (Blomhoff *et al.,* 2006; Alper and Mattes, 2003; Awad *et al.,* 2000; Morris *et al.,* 2004).

The importance of the crop is informed by its cultivation on all the six continents of the world. In Africa, Senegal and Nigeria are the major producers of the crop. To diversify Ghana's market opportunities, research effort is currently being directed towards the promotion of confectionery groundnuts, for which there is a ready export market and whose added value is more advantageous for the national economy (Dimanche and Kane, 2000).

Production constraints of groundnut in general are many including both abiotic and biotic factors, but establishing the relative importance of individual production constraint is often challenging. Aflatoxins, which are toxic and carcinogenic metabolites, produced by *Aspergillus flavus* constitute a major constraint to production. More importantly, aflatoxin has been designated as a human liver carcinogen (Wogan, 1999), while rosette the most destructive viral disease of groundnut in Africa results in drastic yield reduction (Herselman *et al.,* 2004). The poikilothermic, microscopic pests and plant parasitic nematodes are also of significant agronomic importance (Dickson and De Waele, 2005). In Ghana, Osei *et al.* (2005) reported the infestation of groundnut fields by plant parasitic nematodes in a nationwide survey. Many nematode species have been reported to negatively affect the production of groundnut. The most important include: the groundnut root-knot nematode, *Meloidogyne arenaria* which infestation result in yellowing of foliage and stunting (Zhang, 1985). Heavy infestation by the lesion nematode, *Pratylenchus brachyurus* reduces root systems and pod weight (Boswell, 1968). Wheeler and Starr (1987) observed the damaging effect of sting nematode, *Belonolaimus longicaudatus* on groundnut plants. The testa nematode, *Aphelenchoides arachidis* parasitize pods, testae, roots and hypocotyls (Bos, 1977) while the groundnut pod nematode, *Ditylenchus africanus* severely damaged groundnut in South Africa (Jones and De Waele, 1988).

Synthetic chemicals (nematicides) have been very effective in managing plant parasitic nematodes populations but have come under serious condemnation on grounds of environmental pollution (Bell, 2000). Management option which is as effective as nematicides with little or no impact on the environment must be sought for. In the search for more sustainable and effective management system, the potential of host plant resistance was investigated in this study. The objective of the study was therefore, to evaluate sixteen confectioneries groundnut accessions for plant parasitic nematode resistance.

MATERIALS AND METHODS

Treatments and experimental design

Sixteen (16) confectionery groundnut accessions comprising fifteen (15) improved accessions sourced from International Crops Research Institute for the Semi-Arid Tropics, India and a local check, “Adepa” were evaluated at four locations viz: Fumesua, Wenchi, Ejura and Atebuba during 2011growing season. The treatments were mounted in a 4 x 4 lattice design and replicated three times at all locations. Seeds were sown in four-row plots, five metres long at spacing of 50 cm between and 20 cm within rows.

Experimental sites

The field trials were conducted at Fumesua (01^{o} 28' N 06^{o} 41' W) in the forest agro-ecological Zone and at Wenchi (07^{o} 30' N 02^{o} 15' W), Ejura (07^{o} 24' N 01^{o} 21' W) and Atebubu (7 ^{o} 23' N 01^{o} 26 ' W) in the forest-savannah transitional zones of Ghana.

Data collection, sampling and extraction

Soil samples were collected at two time periods before sowing of groundnut seeds and at harvest of the crop with a soil auger to a depth of 20 cm. The soil samples, 200 cm^3 per treatment were extracted using the modified Baermann funnel method. After 24 h of extraction, samples were fixed with TAF (Formalin-37% formaldehyde 7.6 ml, Tri-ethylamine 2 ml and Distilled water 90.4 ml) and second, third and fourth stage nematodes were mounted on aluminium double-cover glass slides and specimens were identified CIH (1978) using morphological characteristics such as the spear, head skeleton, lumen of the oesophagus, excretory pore and spicules. Agronomic parameters of the groundnut measured included days to 50% anthesis, days to maturity, pods /plant and pod yield.

Statistical analysis

Yield and other continuous data were not transformed but nematode count data were log transformed [ln (x+1)] to improve homogeneity of variance. Statistical analysis was performed using Genstat 8.1 software. Significant mean separation was determined with Fisher's Least Significance Difference (LSD) test at p = 0.05.

Table 1: Characteristics of the groundnut accessions used in the study

Accession	Source	Maturity	Growth type
ICGV 97040	ICRISAT India	Medium	Erect
ICGV 97045	ICRISAT India	Medium	Erect
ICGV 97047	ICRISAT India	Medium	Erect
ICGV 97049	ICRISAT India	Medium	Erect
ICGV 97051	ICRISAT India	Medium	Erect
ICGV 97058	ICRISAT India	Medium	Erect
ICGV 97061	ICRISAT India	Medium	Erect
ICGV 98396	ICRISAT India	Medium	Erect
ICGV 98397	ICRISAT India	Medium	Erect
ICGV 98402	ICRISAT India	Medium	Erect
ICGV 98404	ICRISAT India	Medium	Erect
ICGV 98412	ICRISAT India	Medium	Erect
ICGV 98426	ICRISAT India	Medium	Erect
ICGV 98432	ICRISAT India	Medium	Erect
ICGV 98439	ICRISAT India	Medium	Erect
ADEPA	Ghana	Late	Semi erect

Maturity range: Medium (101-110 days); Late (>120 days)

RESULTS AND DISCUSSION

The nematode taxa encountered from initial soil samples across locations included; *Meloidogyne arenaria*, *Pratylenchus brachyurus*, *Rotylenchulus reniformis*, *A. arachidis* and *Scutellonema* *bradys* at Atebubu; *M. arenaria*, *P. brachyurus*, *R. reniformis* and *A. arachidis* at Fumesua; *M. arenaria*, *P. brachyurus*, and *A. arachidis* were encountered both at Wenchi and Ejura respectively. Soil populations of nematodes were not significantly different. Data not presented.

The diversity of nematode taxa at different locations might be attributed to a peculiar eco-system or the cropping history of the respective locations. At Atebubu, the presence of *S. bradys* was due to the fact that the field had previously been planted with yam, *Dioscorea rotundata* which is susceptible to the pest. Nematodes reacted differently to the confectionery groundnut accessions at harvest. Three accessions ICGV97040, ICGV97051 and ICGV97058 were identified as promising as they consistently recorded significantly low population densities of all nematodes species encountered across locations. At Wenchi, ICGV97040, ICGV97051 and ICGV97058 recorded significant ($P < 0.05$) reductions of approximately (87, 77 and 85%), (91, 90 and 80%) and (78, 84 and 100%) in *M. arenaria, P. brachyurus* and *A. arachidis* compared with (ICGV98426, ICGV98397 and ICGV98404) respectively (Table 2). Similarly, ICGV97040, ICGV97051 and ICGV97058 recorded significant reductions of (92, 94 and 79%), (92, 89 and 97%) and (86, 79 and 100%) in *M. arenaria, P. brachyurus* and *A. arachidis* compared with ICGV97045, ICGV97047 and ICGV97049 respectively at Ejura (Table 3).

Table 2: Plant parasitic nematodes population/200 cm^3 soil at Wenchi

Accession	*M. arenaria*	*P. brachyurus*	*A. arachidis*
ICGV 97040	53(1.7)a	60(1.9)a	38(1.7)a
ICGV 97045	340(2.5)c	22(1.6)a	72(1.9)a
ICGV 97047	165(2.2)b	44(1.7)a	0*
ICGV 97049	220(2.3)b	41(1.7)a	26(1.4)a
ICGV 97051	36(1.6)a	26(1.6)a	51(1.7)a
ICGV 97058	88(2.0)a	41(1.7)a	0
ICGV 97061	268(2.3)b	118(2.2)b	0
ICGV 98396	231(2.3)b	0	83(1.9)a
ICGV 98397	280(2.4)c	260(2.4)c	26(1.4)a
ICGV 98402	201(2.2)b	122(2.2)b	40(1.7)a
ICGV 98404	24(1.5)a	58(1.8)a	254(2.3)c
ICGV 98412	318(2.5)c	23(1.6)a	219(2.1)c
ICGV 98426	401(2.6)d	40(1.7)a	77(1.8)a
ICGV 98432	55(1.7)a	0	166(2.0)b
ICGV 98439	234(2.4)b	118(2.2)b	163(2.0)b
ADEPA	261(2.4)b	76(1.9)a	83(1.9)a
LSD ($P < 0.05$)	(0.4)	(0.3)	(0.3)

Data are means of three replications: *Data not used in analysis ‡Log transformed ln (x + 1) data used in ANOVA in parenthesis. Means within the same column followed by the same letter are not significantly different at P = 0.05.

Table 3: Plant parasitic nematodes population/200 cm³ soil at Ejura

Accession	*M. arenaria*	*P. brachyurus*	*A. arachidis*
ICGV 97040	36(1.7)a	27(1.6)a	65(1.5)b
ICGV 97045	477(2.5)e	192(2.1)c	44(1.4)a
ICGV 97047	264(2.3)cd	466(2.6)f	237(1.9)d
ICGV 97049	350(2.4)d	255(2.3)d	305(2.0)e
ICGV 97051	36(1.7)a	50(1.7)a	8(1.3)a
ICGV 97058	66(1.8)a	99(1.9)ab	0*
ICGV 97061	307(2.4)d	187(2.0)b	105(1.7)c
ICGV 98396	240(2.2)c	266(2.4)d	82(1.6)b
ICGV 98397	363(2.4)d	419(2.5)e	186(1.8)cd
ICGV 98402	175(2.1)b	187(2.0)b	72(1.5)b
ICGV 98404	80(1.9)ab	162(2.0)b	84(1.6)b
ICGV 98412	244(2.2)c	238(2.2)cd	117(1.7)c
ICGV 98426	246(2.2)c	77(1.8)a	0
ICGV 98432	20(1.7)a	79(1.8)a	113(1.7)c
ICGV 98439	311(2.4)d	161(2.0)b	40(1.4)a
ADEPA	124(2.0)b	237(2.2)cd	0
LSD (P <0.05)	(0.4)	(0.4)	(0.2)

Data are means of three replications: *Data not used in analysis ‡Log transformed ln (x + 1) data used in ANOVA in parenthesis; Means within the same column followed by the same letter are not significantly different at P = 0.05.

The potentials of ICGV97040, ICGV97051 and ICGV97058 to resist nematodes infection were further demonstrated at Fumesua and Atebubu. Tables 4 and 5 present significant reductions of (88, 85, 92 and 92%), (83, 90, 84 and 70%) and (86, 89, 89 and 86%) in *M. arenaria, P. brachyurus, R. reniformis* and *A. arachidis* compared with ICGV97049, ICGV97045, ICGV98397 and ICGV98402 respectively and reductions of (94, 91, 97, 93 and 100%), (91, 81, 86, 87 and 96%) and (92,91, 95, 96 and 84%) were recorded in ICGV98397, ICGV98397, ICGV97049, ICGV98397 and ICGV98412 respectively. In a similar experiment Starr and Morgan (2002) identified *Meloidogyne arenaria* and *M. javanica* resistance in Nema Tam a groundnut variety.
Resistance is a plant's ability to inhibit nematode reproduction relative to that on a susceptible genotype, whereas tolerance describes a plant's response to parasitism where less yield suppression is recorded than an intolerant plant at similar levels of parasitism (Roberts, 2002). Resistance is highly specific being effective against only a single species or even one race of a species (Roberts, 1992).

Table 4: Plant parasitic nematodes population/200 cm^3 soil at Fumesua

Accession	*M. arenaria*	*P. brachyurus*	*R. reniformis*	*A. Arachidis*
ICGV 97040	40(1.6)a	47(1.6)a	32(1.6)a	13(1.6)a
ICGV 97045	266(2.2)d	309(2.3)d	195(2.4)c	147(2.1)b
ICGV 97047	284(2.2)d	210(2.1)c	286(2.4)c	153(2.2)b
ICGV 97049	339(2.3)e	166(1.9)b	172(2.4)c	0*
ICGV 97051	57(1.7)a	30(1.5)a	66(1.9)a	48(1.6)a
ICGV 97058	49(1.6)a	34(1.5)a	45(1.8)a	23(1.6)a
ICGV 97061	226(2.0)b	219(2.2)c	150(2.3)b	13(1.6)a
ICGV 98396	257(2.1)c	149(1.8)b	88(2.1)b	0
ICGV 98397	247(2.1)c	107(1.7)a	419(2.6)d	104(1.7)a
ICGV 98402	293(2.3)e	195(2.1)c	81(2.1)b	162(2.3)c
ICGV 98404	40(1.6)a	26(1.5)a	32(1.6)a	40(1.6)a
ICGV 98412	269(2.2)d	14(1.7)a	175(2.4)c	147(2.1)b
ICGV 98426	231(2.0)b	190(2.0)b	121(2.1)b	37(1.6)a
ICGV 98432	204(1.9)b	138(1.8)b	114(2.1)b	08(1.7)a
ICGV 98439	130(1.8)a	162(1.9)b	0	0
ADEPA	122(1.8)a	113(1.7)a	71(1.9)a	29(1.6)a
LSD (P <0.05)	(0.2)	(0.2)	(0.3)	(0.4)

Data are means of three replications: *Data not used in analysis ‡Log transformed ln (x + 1) data used in ANOVA in parenthesis; Means within the same column followed by the same letter are not significantly different at P=0.05.

Table 5: Plant parasitic nematodes population/200 cm^3 soil at Atebubu

Accession	*M. arenaria*	*P. brachyurus*	*R. reniformis*	*A. arachidis*	*S. bradys*
ICGV 97040	55 (1.6)a	73 (1.6)a	8(1.2)a	42 (1.6)a	0*
ICGV 97045	476(2.6)e	603(2.7)d	43 (1.7)b	40 (1.6)a	26 (1.4)a
ICGV 97047	287(2.4)c	696(2.8)d	0	82 (1.7)a	37 (1.4)a
ICGV 97049	627(2.8)f	517(2.7)d	282(2.4)d	359(2.5)d	144(2.2)c
ICGV 97051	75 (1.7)a	163(2.1)b	40 (1.7)b	81(1.7)a	12 (1.1)a
ICGV 97058	66 (1.7)a	76 (1.6)a	15 (1.3)a	24(1.4)a	47(1.6)a
ICGV 97061	315(2.5)d	457(2.6) c	270(2.4)d	125(1.8)b	40 (1.6)a
ICGV 98396	89 (1.7)a	203(2.2)b	14 (1.3)a	80(1.7)a	68(1.7)b
ICGV 98397	853(2.9)f	842(2.9)e	39 (1.7)b	605(2.8)e	170(2.3)d
ICGV 98402	643(2.8)f	407(2.5)c	0	398(2.5)d	87(2.0)b
ICGV 98404	80 (1.7)a	53 (1.5)a	0	28 (1.4)a	4(1.1)a
ICGV 98412	199(2.2)b	405(2.6)c	36 (1.7)b	137(1.8)b	287(2.5)d
ICGV 98426	565(2.7)e	609(2.7)d	0	436(2.6)d	122(2.2)c
ICGV 98432	539(2.6)e	456(2.6)	0	281(2.4)c	118(2.1)c
ICGV 98439	283(2.4)c	276(2.4)c	0	177(1.9)b	113(2.1)c
ADEPA	125(2.0)b	170(2.0)b	80 (2.2)c	247(2.1)c	89 (1.8)b
LSD (P<0.05)	(0.3)	(0.2)	(0.3)	(0.3)	(0. 4)

Data are means of three replications: *Data not used in analysis ‡Log transformed ln (x + 1) data used in ANOVA in parenthesis. Means within the same column followed by the same letter are not significantly different at P = 0.05.

The analysis of variance showed significant differences ($P < 0.05$) amongst accessions regarding days to 50% anthesis (Table 6). The longest period of 30 days to 50% anthesis occurred at Ejura in ICGV98439 and the local check, Adepa whilst the shortest period of 26 days occurred at Fumesua in ICGV97040, ICGV97045, ICGV97051, ICGV97058, ICGV98396, ICGV98397, ICGV98402, ICGV98404 and ICGV98412 and at Atebubu in ICGV97058, ICGV98412 and ICGV98432. The longer the days to 50% anthesis the longer the maturity period and in most cases, the higher the yield (Dawood, 2011).

Similarly, differences were recorded in maturity periods of accessions (Table 7). The longest maturity period of 110 days was observed in ICGV97047, ICGV97058, ICGV97061 and ICGV98404 at Wenchi whilst the shortest maturity period of 93 days was observed in ICGV97040 and ICGV97058 at Ejura.

Maturity period is a major physiological-genetic component for crop yield accumulation (Yan and Wallace, 1995). In consonance with this finding, Dawood (2011) observed a significant positive correlation between the number of days to physiological maturity and grain yield. The longer the maturity period of a variety of crop specie, the higher the yield.

Table 6: Days to 50% anthesis at the four locations

Accession	Fumesua	Wenchi	Ejura	Atebubu
ICGV 97040	26b	27b	27c	27bc
ICGV 97045	26b	28ab	29a	28ab
ICGV 97047	29a	28ab	28b	28ab
ICGV 97049	27ab	27b	28b	27bc
ICGV 97051	26b	27b	28b	27bc
ICGV 97058	26b	28ab	28b	26c
ICGV 97061	29a	28ab	29a	29a
ICGV98396	26b	27b	28b	28ab
ICGV 98397	26b	27b	27c	27bc
ICGV 98402	26b	27b	27c	27ab
ICGV 98404	26b	27b	28b	27bc
ICGV 98412	26b	27b	28b	26b
ICGV 98426	27ab	27b	28b	27bc
ICGV 98432	28a	28ab	28b	26c
ICGV 98439	28a	29a	30a	28ab
ADEPA	28a	28ab	30a	28ab
LSD ($P < 0.05$)	1.0	1.1	1.4	1.8

Data are means of three replications. Means within the same column followed by the same letter are not significantly different at P = 0.05.

Table 7.Days to maturity of Accessions at the four locations

Accessions	Fumesua	Wenchi	Ejura	Atebubu
ICGV 97040	101a	109a	93 e	102b
ICGV 97045	104a	109a	97d	108a
ICGV 97047	105a	110a	101c	106a
ICGV 97049	104a	108a	105b	101b
ICGV 97051	99a	107b	102c	106a
ICGV 97058	103a	110a	93e	107a
ICGV 97061	104a	110a	101c	103b
ICGV98396	102a	108a	108a	107a
ICGV 98397	101a	109a	108a	105a
ICGV 98402	103a	109a	97d	106a
ICGV 98404	101a	110a	109a	107a
ICGV 98412	95a	109a	101c	105a
ICGV 98426	100a	109ab	101c	105a
ICGV 98432	103a	109ab	108a	108a
ICGV 98439	95a	109a	101c	103b
ADEPA	103a	108a	101c	106a
LSD (P <0.05)	6.4	2.2	1.6	4.8

Data are means of three replications. Means within the same column followed by the same letter are not significantly different at P = 0.05.

Pods produced per plant are positively correlated with yield just as yield is a function of plant population (Akbar *et al.,* 2010). All other things being equal, the higher the number of pods/plant, the higher the yield. Significant differences were observed amongst accessions in relation to the number of pods/plant (Table 8). The highest mean number of pods/plant (112.2) was recorded in ICGV98402 at Fumesua while the lowest of 12.8 was recorded in ICGV97047 at Atebubu. In this study, Fumesua generally recorded the highest number of pods/plant but the highest yield (3. 2 t/ha) occurred at Wenchi in ICGV97051. It must however be pointed out that ICGV97051 also recorded the highest number (39.9) of pods/plant at Wenchi. It could therefore be emphasized that, yield is not dependent only on the number of pods/plant and days to maturity but on other factors such as the native fertility level of soil and weed management.

Yield was variable across the locations. Yield was generally high at Wenchi and low at Atebubu (Table 9). ICGV97051 the highest yielding accession was approximately 97% higher than ICGV97061 the lowest yielding accession. ICGV97049 identified as susceptible to plant

parasitic nematodes recorded significant yields across locations and was not different from ICGV97051 the highest yielding accession at Wenchi. ICGV97049 recorded yields of (68, 36, 69 and 84%) higher than ICGV97047, Adepa, ICGV97045 and ICGV97061 the lowest yielding accessions at Fumesua, Wenchi, Ejura and Atebubu respectively.

Table 8: Pods per plant of Accessions at the four locations

Accession	Fumesua	Wenchi	Ejura	Atebubu
ICGV 97040	105.3a	26.5a	24.6b	25.5a
ICGV 97045	95.7a	24.8b	24.4b	21.5a
ICGV 97047	73.5b	22.7b	28.7a	12.8a
ICGV 97049	77.0b	21.9b	23.7b	23.0a
ICGV 97051	81.3b	39.9a	17.9c	23.6a
ICGV 97058	74.2b	32.0a	31.9a	20.5a
ICGV 97061	76.3b	28.3a	23.5b	18.3a
ICGV98396	75.5b	32.8a	36.3a	26.0a
ICGV 98397	97.8a	26.0a	21.5b	23.5a
ICGV 98402	112.2a	39.3a	30.0a	23.9a
ICGV 98404	81.3b	30.8a	24.0b	23.0a
ICGV 98412	77.8b	24.0a	33.5a	16.1a
ICGV 98426	91.2a	19.0c	23.3b	13.6a
ICGV 98432	72.7b	26.7a	29.5a	19.2a
ICGV 98439	56.7c	32.8a	26.9a	17.7a
ADEPA	103.2a	36.6a	27.1a	30.2a
LSD (P <0.05)	28.4	14.4	11.2	18.0

Data are means of three replications. Means within the same column followed by the same letter are not significantly different at P = 0.05.

Table 9: Pod yield (kg/ha) of Accessions at the four locations

Accession	Fumesua	Wenchi	Ejura	Atebubu
ICGV 97040	773d	2449a	1241a	615b
ICGV 97045	513d	2335a	295c	760b
ICGV 97047	332d	2287b	438b	297c
ICGV 97049	1031b	2778a	946a	657b
ICGV 97051	551d	3236a	524b	486b
ICGV 97058	639d	2637a	682a	536b
ICGV 97061	944c	1820c	499b	105c
ICGV98396	832c	3026a	631b	474b
ICGV 98397	565d	2355a	751a	529b
ICGV 98402	700d	2943a	912a	571b
ICGV 98404	941c	2612a	513b	807b
ICGV 98412	1546a	2874a	580b	566b
ICGV 98426	738d	2211b	550b	439b
ICGV 98432	670d	2485a	705a	749b
ICGV 98439	584d	2701a	668a	717b
ADEPA	723d	1783c	851a	1522a
LSD (P <0.05)	456	913.8	576	460

Data are means of three replications. Means within the same column followed by the same letter are not significantly different at P = 0.05.

CONCLUSION

ICGV97049 was found to possess some levels of nematode tolerance potential. ICGV97040, ICGV97051 and ICGV97058 on the other hand demonstrated significant resistance potential

which could be exploited in groundnut breeding work. However, ICGV97051 was identified as the most promising accession on account of high yielding and nematode suppression potential.

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