

The Effect of *Meloidogyne Incognita* on Growth of Date Palm Seedlings

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Abstract: In pot trial effect on growth factors of date palm seedlings due to root knot nematode, *Meloidogyne incognita*, infection was estimated. All factors were significantly affected by the nematode infection except shoot length where it was only 9.5% reduction. Maximum reduction was observed in fresh root weight (44.24%) followed by dry shoot weight (31.76%).

Key words: *Meloidogyne incognita*, Date palm, 2nd stage juvenile, root gall index.

1. INTRODUCTION

Because of root knot nematodes, particularly *Meloidogyne incognita*, it is very difficult and sometimes impossible to grow important vegetables, such as tomato, in the tropics and semi-tropics (W.F.Mai). The yield loss due to root knot nematodes, *Meloidogyne* spp, alone has been estimated to be 30 – 50% (Jain 1991). For many crops the problem due to root knot nematodes is overlooked because of lack of obvious above ground symptoms. One difficulty with assessing nematode impact is that damage resulting from nematode infection is often less obvious than that caused by many other pests or diseases (J. M. Nicol *et al.*). Many date palm trees were also found infected with these nematodes without showing any above ground symptom. The presence of many plant-parasitic nematodes in date palm rhizosphere that could be of potential importance (A. Mani, 2005). The study regarding the yield loss on date palm due nematodes has not been carried out so far. There are many unknown factors which affect the growth and productivity of date palm. It is possible that much of the unhealthy growth of palms, generally attributed to other causes, may be due to nematode attack (A. Zaid *et al.*).

The objective of present study is to estimate the effect of root knot nematode, *Meloidogyne incognita*, on growth parameters of date palm seedlings.

2. MATERIALS AND METHODS

36 date palm seedlings of 2 months old were transplanted in plastic pots containing sterilized soil & potting soil. These seedlings were kept in two sets each with 6 replications and 3 seedlings in each replication. After 4 weeks of transplanting the seedlings in the 1st set (18 seedlings) were inoculated with newly hatched active 2nd stage larvae of root knot nematode, *Meloidogyne incognita*, (2000 larvae per seedling). The second set containing 18 seedlings in 6 replications was kept without inoculation as control. All pots with seedlings were kept inside the glass house and watered regularly. After 1 year of inoculation all seedlings were uprooted, washed and the following data were taken.

- root gall index 1 – 5
- fresh total weight,
- fresh shoot weight,
- fresh root weight,
- shoot length,
- dry shoot weight,
- dry root weight.

3. RESULTS AND DISCUSSION

The results show that even though the root gall severity was 50% in inoculated seedlings all growth factors were significantly affected by root knot nematode infection. Maximum effect was found in fresh root weight where 44.24% reduction occurred followed by dry shoot weight (31.76%). Similar effect was found in fresh shoot weight and dry root weight (28.85% and 28.84%). Least effect was found in shoot length showing only 9.5% reductions.

The result may indicate that the root knot nematodes infection on date palm should not be ignored and management practices should be followed to increase the growth and productivity of date palm.

Table 1. Data showing the root gall severity

Treatment	Severity of infection based on root gall index 1 – 5						
	R1	R2	R3	R4	R5	R6	% severity
Inoculated <i>M.incognita</i>	3	2	3	3	2	2	50
Control	0	0	0	0	0	0	0

Table 2. Data showing the effect in total weight

Treatment	Total Weight in gram.						
	R1	R2	R3	R4	R5	R6	Mean.
Inoculated <i>M.incognita</i>	188.49	206.35	122.85	98.74	93.90	151.30	143.605
Control	248.05	291.58	204.13	196.91	191.85	225.68	226.3667
Reduction	59.56	85.23	81.28	98.17	97.95	74.38	82.7617

Table 3. Data showing the effect in fresh shoot weight

Treatment	Fresh Shoot Weight in gram.						
	R1	R2	R3	R4	R5	R6	Mean.
Inoculated <i>M.incognita</i>	96.62	81.48	95.07	54.09	45.87	109.29	80.40333
Control	115.53	110.31	113.08	100.71	96.76	141.69	113.0133
Reduction	18.91	28.83	18.01	46.62	50.89	32.4	32.60997

Table 4. Data showing the effect in fresh root weight

Treatment	Fresh Root Weight in gram.						
	R1	R2	R3	R4	R5	R6	Mean.
Inoculated <i>M.incognita</i>	91.87	124.87	27.78	44.65	48.03	42.01	63.20167
Control	132.52	181.27	91.05	96.2	95.09	83.99	113.3533
Reduction	40.65	56.4	63.27	51.55	47.06	41.98	50.15167

Table 5. Data showing the effect in shoot length

Treatment	Shoot length in cm.						
	R1	R2	R3	R4	R5	R6	Mean.
Inoculated <i>M.incognita</i>	77	53.4	46	46	47	55	54.06667
Control	88	60	38	50.5	54	68	59.75833
Reduction	11	6.6	8	4.5	7	13	5.69166

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Table 6. Data showing the effect on dry shoot weight

Treatment	Dry Shoot Weight in gram.						
	R1	R2	R3	R4	R5	R6	Mean.
Inoculated <i>M.incognita</i>	36.11	45.89	18.28	38.96	18.24	30.61	31.34833
Control	46.22	58.88	38.96	46.70	45.18	39.71	45.94167
Reduction	10.11	12.99	20.68	7.74	26.94	9.1	14.59333

Table 7. Data showing effect on dry root weight

Treatment	Dry Root Weight in gram.						
	R1	R2	R3	R4	R5	R6	Mean.
Inoculated <i>M.incognita</i>	21.72	32.33	17.12	5.21	9.73	21.99	19.68333
Control	32.26	38.60	22.38	20.41	16.65	35.67	27.66167
Reduction	10.54	6.27	5.26	5.2	6.92	13.68	7.978333

Table 8. Data showing the percentage reduction in growth factors

Treatment	Total Weight in gram.	Fresh Shoot Weight in gram.	Fresh Root Weight in gram.	Dry Shoot Weight in gram.	Dry Root Weight in gram.	Shoot length in cm.
Inoculated <i>M.incognita</i>	143.605	80.40333	63.20167	31.34833	19.68333	54.06667
Control	226.3667	113.0133	113.3533	45.94167	27.66167	59.75833
Reduction	82.7617	32.60997	50.15167	14.59333	7.978333	5.69166
% Reduction	36.5609	28.855	44.24364	31.76493	28.84258	9.5245

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