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EFFECT OF NEEM LEAVES AND CARBOFURAN ON *PRATYLENCHUS THORNEI* ASSOCIATED WITH THREE WHEAT VARIETIES

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The effect of carbofuran and dry Neem leaves in single and double dosage on population of *Pratylenchus thornei* and growth parameters of 3 wheat varieties *viz*., Faisalabad-85, Khyber-87 and Sarhad-82 were examined. All the three treatments resulted in increased root weight as well as the thousand seed weight. Population level of *P. thornei* was most reduced by double dosage of neem.

Key words: *Pratylenchus thornei*, Wheat, Control, Carbofuran, Neem.

Introduction

During yearly surveys of wheat (*Triticum aestivum* L.) fields at Crop Diseases Research Institute, Karachi, *Pratylenchus thornei* Sher and Allen, 1953 was found in high numbers (215/100 c.c. of soil) which was 60% of total nematode population, around the roots as well as in the soil.

P. thornei is a known pest of cereals and its association with wheat in the region poses a great danger to the crop if control measures are not undertaken. For this purpose an attempt was made to study the efficacy of coarsely crushed dried neem *Azadirachta indica* (L.) A. Juss) leaves in single and double dosage in comparison to carbofuran against *P. thornei* associated with three wheat varieties.

Materials and Methods

The experiment design was a complete block design with four replications. Each plot was 3x4 m^2 located at Crop Diseases Research Institute, University of Karachi. The initial population was 215/100 ml of soil. The soil was tilled three times within two weeks before applying the treatment. The chemicals were incorporated seven days before sowing to a soil at a depth of 5-10 cm.The treatments applied in this study included (i) control (no treatment) (ii) carbofuran 3G, 2-3 dihydro-2,2-dimethyl benzuforan-7-nyl methyl carbamate at a rate of 10 kg/ha (iii) coarsely crushed leaves of neem, single dosage, at a rate of 833 kg/ha (iv) coarsely crushed leaves of neem double dosage, at a rate of 1666 kg/ha. Irrigation was done once a week and fertilizers were applied as needed. At the time of harvest plant growth parameters including fresh root and shoot weight, root and shoot length, number of tillers, number of spikes, length of spikes and weight of 1000 grains were determined.

Initial nematode population was determined one week before treatment and the final population at the time of the harvest by method [3] using a composite soil sample from each microplot. Data for each parameter was subjected to factorial analysis of variance (FANOVA) [4].

Results and Discussion

Although all the three treatments *viz*. carbofuran, single and double dosage of neem reduced the population of *P. thornei*. Double dosage of neem was the most effective in reducing the population level of *P. thornei* (P at the most 0.05, Fig. 1) over the initial population, followed by carbofuran and single dosage of neem. The population of control and treated microplots was recorded irrespective of the varieties used.

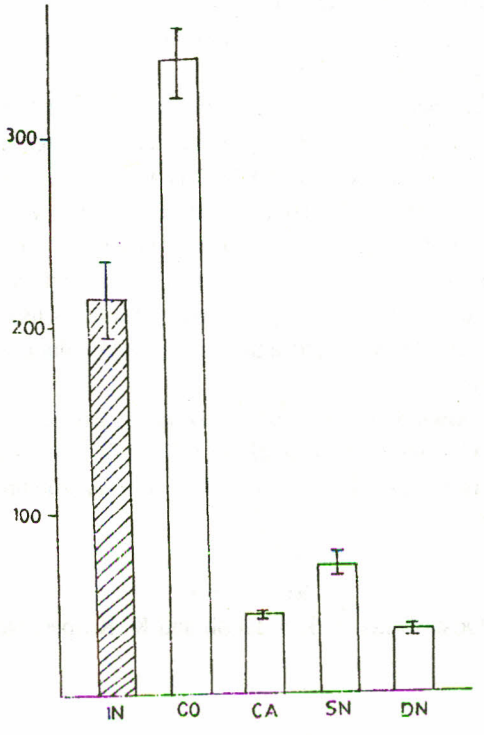

Fig. 1. Initial and final population of *P. thornei* (IN = initial, CO = control, CA= carbofuran, SN = single dosage neem and DN = double dose neem).

TABLE 1. EFFECT OF CARBOFURAN AND NEEM LEAVES ON GROWTH AND YIELD OF THREE WHEAT VARIETIES. MEAN FOLLOWED BY ± STANDARD ERROR.

Variety	Treatment	Root length (cm)	Shoot length (cm)	Root wt. (g)	Shoot wt. (g)	Length of spike (cm)	Number of spike	1000 grains wt. (g)	Number of tillers
Faisalabad-85	Control	15.25±1.10	82.5±2.62	26.5±8.33	92.75±34.45	9.5±0.86	11.35±3.49	40.67±0.18	11.75±3.49
	Carbofuran	16.5±1.04	86±2.94	97±7.22	93.5±4.64	10.75±0.74	12±1.47	40.99±0.12	12±1.47
	Neem 1	15±0.81	83±2.73	33.75±10.27	156±26.21	9.75±0.25	16.75±2.21	44.62±0.30	18±2.44
	Neem 2	12.25±0.62	83.5±2.53	34.5±13.29	157.75±48.39	10.25±0.24	18.5±5.60	44.97±0.06	18.75±5.40
Khyber-87	Control	12.75±1.70	75.25±3.98	34±10.44	35.25±34.08	9.5±0.64	27±7.67	43.22±0.04	27±7.67
	Cobofuran	19±1.77	77±1.22	84.5±17.85	135.5±19.76	9.5±0.86	26.25±3.75	43.98±0.04	27.25±3.68
	Neem 1	14.75±0.94	75.25±2.86	54±14.30	139.5±29.15	9.75±0.25	26.5±4.17	43..37±4.06	26±4.81
	Neem 2	15.5±0.28	81.2±2.17	55.5±9.21	169±46.99	9.75±0.25	27±2.94	44.01±0.10	27±2.94
Sarhad-82	Control	15.25±0.85	90.75±3.24	27±6.72	113.25±8.87	10.02±0.02	15.75±1.88	44.8±0.03	15.75±1.88
	Carbofuran	16.25±0.85	91.5±0.95	46.5±9.21	129.5±26.36	10.02.±0.02	15.5±1.32	44.9±0.08	15.5±1.32
	Neem 1	16.5±1.32	91.5±2.21	64.75±19.13	167.75±51.51	10.02±0.02	18.5±5.04	44.1±1.00	18.5±5.04
	Neem 2	16.5±1.32	86.25±2.24	66±1.08	174±29.31	10.02±0.02	19.5±2.36	45..28±0.27	20±2.61

Table 1 provides the growth and yield parameters of the three varities as influenced by the treatments. The root weight was increased by the treatments. The interaction of treatments and varieties was significant. Shoot weight remained more or less the same in all the treatments. Spike length did not differ significantly among varieties or treatments. The number of spikes and number of tillers differed significantly among varieties ($P<0.001$) but not in treatments. Thousand grain weight was significant for treatments as well as varieties ($P<0.001$).

P. thornei can infest several plant species especially cereals and legumes [5], being an endoparasitic nematodes it penetrates the parenchyma and forms activities in the cortex [6], causing damage to root system, earlier workers [7-14] have successfully used chemicals for control of nematodes associated with wheat but the chemicals being expensive and a source of environmental pollution, more trials using plant material should be tested against important plant parasitic nematodes.

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