https://doi.org/10.29321/MAJ.10.A01938

Madras Agric. J. 77(3 & 4): 169-172 Mar-Apr. 1990

EVAULATION OF INSECTICIDES FOR THE CONTROL OF THE THRIPS *SCIRTOTHRIPS DORSALIS* HOOD ON CHILLIES (*CAPSICUM ANNUUM* L.)

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ABSTRACT

Among the insecticides tried for the control of the chilli thrips, **Scirtothrips dorsalis** Hood, seven days after treatment under pot culture, monocrotophos was significantly superior to all other treatments with 95.07 per cent reduction followed by triazophos and carbosulfan with 87.98 and 87.52 per cent reduction respectively. Dichlorvos was the least effective among the treatments which gave 71.07 per cent reduction. Under field experimentation also monocrotophos registered 94.97 per cent reduction, followed by phosalone, carbosulfan and triazophos with 89.61 85.92 and 84.64 per cent reduction respectively which were on par. The maximum yield was obtained in monocrotophos treatment followed by triazophos, phosalone, methyl-o-demeton and carbosulfan. However, the maximum cost-benefit ratio of 1:9.9 was given by methyl-o-demeton application followed by phosalone with 1:6.9 and monocrotophos with 1:6.1.

KEY WORDS: Chillies, Thrips, Insectiicides

Chilli or red pepper, *Capsicum annuum*. L. is one of the important commerical condiment crops cultivated throughout the country. It occupies about 8.2 lakh hectares with a production of 5.5 lakh tonnes of dry chillies. In recent years, the cultivation of chilli has become uneconomical owing to the damage by a variety of pests and diseases which causes losses in yield. Among the insect pests, the thrips, **Scirtothrips dorsalis**, attack the crop in all parts and causes 30-50 per cent yield loss in South India.

Insecticidal treatments were recommended from time to time with the introduction and availability of newer chemicals (Jagan Mohan *et al*, 1980; Reddy and Jagadish, 1980; Dhandapani and Jayaraj, 1982; Dhandapani and Kumarasamy, 1983 and Ramudu and Reddy, 1983). With a view to find out the effective and economical chemical for the control of the chilli thrips and to re-evaluate some of the recommended chemicals, seven insecticides were tried both under pot culture and field conditions.

MATERIALS AND METHODS

A pot culture experiment was conducted with three replications in randomised block design with 45 days old seedlings planted at two seedlings per pot. Calender based application of insecticides was done, with the first spraying 25 days after planting and subsequent three sprayings were given at 15 days intervals. The spray fluid was applied at 500 l/ha in the first and second sprayings and 750 l/ha in the subsequent sprayings.

The field experiment was conducted with the same insecticides, at the same dosage, in a randomised block design with three replications.

Table 1. Evaluation of insecticides against Chilli thrips S. dorsalis (Pot culture experiment)

Treatments	Initial population No.of thrips/6 leaves	Corrected per cent reduction 7 days after First spraying	Second spraying	Third spraying	Fourth spraying
Dichlorvos 100 EC 0.1%	38	66.89^{d} (54.94)	68.17^{d} (55.68)	73.37^{c} (58.94)	71.07^{e} (57.45)
Monocrotophos 36 WSC 0.00%	42	97.67^{a} (81.22)	95.08^{a} (77.17)	97.21^{a} (80.43)	95.07^{a} (77.21)
Endosulfan 35 EC 0.07%	42	89.29^{c} (71.00)	82.87^{c} (65.59)	80.52^{d} (63.92)	83.21^{d} (65.84)
Triazophos 40EC 0.04%	45	94.97^{ab} (77.15)	91.50^{b} (73.09)	89.28^{bc} (71.03)	87.90^{b} (69.74)
Phosalone 35 EC 0.07%	42	90.68^{bc} (72.22)	80.40^{b} (71.09)	89.10^{bc} (70.83)	84.38^{cd} (66.74)
Methyl-o-demeton 25EC 0.025%	42	91.58^{bc} (73.02)	88.52^{b} (70.62)	85.73^{c} (67.80)	81.34^{d} (64.06)
Carbosulfan 20 EC 0.04%	40	91.04^{bc} (72.65)	92.10^{b} (73.83)	89.96^{b} (71.59)	87.52^{bc} (69.39)
Untreated control	40	-	-	-	-

The means in a column followed by same letter are not significantly different by least significant criterion (P=0.05). In parentheses, the values arcsin $\sqrt{P}$: where P is the corrected percent reduction.

Table 2. Evaluation of insecticides against chilli thrips, S. dorsalis (Field experiment)

Treatment	Initial population No.of thrips/30 leaves	Corrected per cent reduction 7 days after First spraying	Second spraying	Third spraying	Fourth spraying	Fifth spraying	Yield of dry chillies kg/ha	Cost benefit ratio
Dichlorovos 100 EC 0.1%	203.0	70.05^{d} (57.31)	74.49^{a} (59.68)	73.04^{f} (58.76)	72.46^{d} (58.40)	62.20^{d} (52.10)	1290^{d}	1:3.2
Monocrotophos 36 WSC 0.00%	218.0	97.66^{a} (81.24)	97.20^{a} (80.43)	97.76^{a} (81.52)	97.85^{a} (81.69)	94.97^{a} (77.08)	1760^{a}	1:6.1
Endosulfan 35 EC 0.07%	204.0	92.42^{bc} (73.35)	80.66^{d} (63.99)	86.23^{de} (68.23)	80.75^{c} (64.00)	76.80^{c} (61.10)	1440^{c}	1:5.9
Triazophos 40 EC 0.04%	235.0	92.63^{b} (74.27)	86.37^{c} (68.34)	87.78^{d} (69.61)	80.75^{c} (64.00)	84.64^{d} (66.94)	1585^{b}	*
Phosalone 35 EC 0.07%	223.0	93.98^{b} (75.77)	91.71^{b} (73.57)	95.17^{b} (77.42)	91.24^{b} (72.83)	89.61^{b} (71.52)	1535^{bc}	1:6.9
Methyl-o-demeton 25 EC 0.025%	209.3	91.13^{b} (74.86)	81.11^{d} (64.23)	83.99^{e} (66.42)	84.21^{c} (66.69)	71.51^{c} (57.77)	1510^{bc}	1:9.9
Carbosulfan 20 EC 0.04%	241.3	89.61^{c} (71.25)	81.15^{c} (68.22)	90.77^{c} (72.36)	84.21^{c} (66.97)	85.92^{b} (68.32)	1510^{bc}	*
Control	249.6	-	-	-	-	-	1010^{a}	-

The means in a column followed by the same letter are not significantly different by least significant test criterion (P=0.05). In parentheses the values arcsin $\sqrt{P}$: where P is the corrected percent reduction. * For triazophos and carbosulfan, the cost benefit ratio could not be arrived at since these chemicals have not yet come to the market.

The plot size was 5 × 4 m, each plot consisting of 10 rows with a spacing of 50 cm between the rows and 30 cm between plants. Fortyfive day old seedlings were used for planting at two seedlings per hill. The sprayings were given as in the pot culture experiment with a total of five sprayings.

In pot culture experiment, the population of nymphs and adults was recorded in the morning hours, in both the plants in a pot on three leaves per plant, one each at bottom, middle and top. The mean population of thrips in 18 leaves was taken into account for statistical analysis. Pretreatment counts were taken one day prior to treatment and the post-tratment population assessed seven days after treatment to work out the reduction percentage.

In the field trial, 10 plants were selected at random from the middle eight rows in each plot and the number of thrips from three leaves in each plant one each at bottom, middle and top were recorded. The mean population of 90 leaves was taken for statistical analysis. The pre and post treatment counts were made as in the pot culture experiment. The yield of dry chillies was recorded in seven pickings. Based on the total yield in all the pickings and cost of tratments, the cost-benefit ratio also been worked out.

RESULTS AND DISCUSSION

Monocrotophos 0.08% was significantly superior to other insecticides in reducing the thrips population in all the sprayings both in pot culture and field experiments followed by triazophos and carbosulfan in pot culture experiment and phosalon, carbosulfan and triazophos in the field experiment (Tables 1 and 2). The reduction in thrips population ranged from 95.07 to 97.85 for monocrotophos, 80.75 to 94.97 for triazophos, 81.15 to 92.10 for carbosulfan and 84.38 to 95.17 percent for phosalone. The efficacy of monocrotophos was also reported by earlier workers (Thakre *et al.* 1979; Jagan Mohan *et al.*, 1980; Dhandapani and Kumarasamy, 1983 and Mallikarjuna Rao and Khalid Ahmed, 1985).

Next to monocrotophos, phosalone 0.07% was effective against the thrips in the field study and this is in confirmation with the earlier findings of Sreeramulu (1976) and Ramudu and Reddy (1983). Triazophos 0.04% was as effective as phosalone in all the four sprayings in pot culture experiments with considerable reduction at seven days after insecticidal treatment. In the field experiment also, efficacy of triazophos was similar to phosalone in first and fifth sprayings with 92.63 and 84.64 percent reduction respectively. Hence the new insecticide triazophos can also be considered for use against chilli thrips. Dichlorvos was the least effective among the test insecticides and the ineffectiveness of dichlorvos in reducing thrips population in chilli was also reported by Rangarajan *et al* (1974). The yield of dry chillies was maximum (1760 kg/ha) in monocrotophos treatment followed by triazophos, phosalone, methyl - o - demeton and carbosulfan. The highest cost benefit ratio was obtained in methyl-o-demeton (1:9.9) followed by phosalone (1:6.9) and monocrotophos (1:6.1).

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Madras Agric. J. 77(3 & 4): 172-175 Mar-Apr. 1990

DIVERGENCE ANALYSIS IN CHICKPEA AS INFLUENCED BY ENVIRONMENTS

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ABSTRACT

Sixty diverse genotypes of chickpea evaluated in three environments revealed six clusters formed in environments 1 and 2, whereas seven clusters were formed in environment 3. The number of clusters and constituents of the clusters varied with the environment. Similar was the pattern of intra and inter- cluster distances.

KEY WORDS: Chickpea, genetic divergence, D^2 analysis.

Hybridization has been and will continue to be the most important tool in the hands of breeder in releasing useful variability for subsequent use. While adopting hybridization as the method of breeding, the breeder is always confronted with the choice of the most suitable parents. The problem appears all the more in self pollinated crops. Genetically diverse parents have been considered to have different genetic constitution and hence are likely to produce large variability in F_2 due to genetic recombination. Keeping this in view, the present investigation was undertaken to assess genetic divergence among 60 commercial varieties of chickpea under three environments.

MATERIALS AND METHODS

Fourty four desi and sixteen kabuli diverse genotypes of chickpea (*Cicer arietinum L.*) were evaluated in randomized block design with four replications in each of the three environments. Two of the environments were created by sowing the material at an interval of a fortnight, whereas in the third environment, the material was sown during subsequent year.