

Short Communication

Field Efficacy of Different Insecticides Against Cowpea Aphid, *Aphis craccivora* (Koch.)

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Cowpea (*Vigna unguiculata* Linn.) is an important pulse, fodder and green manure crop of the arid and semi-arid regions of India and *Aphis craccivora* is the major pest on this crop. To study the field efficacy of insecticides, an experiment was conducted at the Agronomy Farm of the S.K.N. College of Agriculture, Jobner, in a randomized block design with three replications of 11 treatments including control. The plot size was 3 m x 1.5 m. The crop was raised by hand dibbling of the seeds of cowpea on July 24, 1989. The plant to plant distance was maintained at 15 cm and the row to row distance at 30 cm. The insecticides, viz., dimethoate 0.03%, formothion 0.025%, methyl demeton 0.02%, monocrotophos 0.03%, thiometon 0.03%, carbosulfan 0.02%, chlorpyrifos 0.02%, fenitrothion 0.05%, phosalone 0.05% and quinalphos 0.03% were sprayed at a rate of 500 L ha⁻¹ (225 ml plot⁻¹) using a hand compression sprayer 50 days after sowing on September 12, 1989.

Observations were recorded on the aphid population on five plants selected at random and tagged for identification in every plot. On each plant, one top, one middle and one lower leaf was selected and the total number of aphids (all stages) in each observation was counted. The aphids were counted at 08:00 h before spray and on 1, 3, 7 and 15 days after the insecticide spray. From this data, percentage reduction by insecticidal spray in the treatments over the population of aphids in control was worked out and the results were analysed statistically by angular transformation (Table 1).

The percentage reduction in the population of aphids 1 day after the insecticide application showed the immediate efficacy of the sprays. Methyl demeton was the most effective, followed by dimethoate. Sivaprakasam *et al.* (1976) and Ambekar *et al.* (1983), however, found monocrotophos to be the best insecticide in the control of *A. craccivora* on chillies and French beans, respectively. Pai & Dhuri (1991) found endosulfan as the most effective insecticide to manage pests of cowpea. Kotadia & Bhalani (1992) and Lal (1992) reported dimethoate to be superior to methyl demeton in the control of *A. craccivora* on cowpea. These variations are due to the different experimental and agroclimatic conditions as well as different concentrations of insecticides used.

All the insecticides showed maximum efficacy in containing the aphid population after 4 to 7 days of application. Among the insecticides, systemics had a distinct advantage over the non-systemics, although the non-systemics fenitrothion and quinalphos were also good in controlling aphids up to a week after application. Broadly, the order of efficacy of the insecticides tested was: methyl demeton > dimethoate > monocrotophos > formothion = thiometon > fenitrothion > quinalphos > carbosulfan > chlorpyrifos > phosalone. The relative superiority of the insecticides on different days after spray is depicted in Table 1. In most of the treatments the margin of reduction in aphid populations lowered drastically after 15 days of spray when the aphids started increasing in number. Jacob & Nayar (1983) found methyl demeton, monocrotophos, and synthetic pyrethroids were highly effective

Table 1 Reduction (% over control) in the population of the aphid *Aphis craccivora* on cowpea crop on different days as after in ecticide spray (figures followed by the same alphabets in a column are statistically on a par)

Insecticide	Spray conc. (%)	Reduction in population (%) over control on days after spray			
		1	3	7	15
Dimethoate	0.03	80.66 (63.92)e	90.41 (71.98)fg	93.17 (74.87)	21.93 (27.92)e
Formothion	0.03	75.58 (62.40)de	86.38 (68.34)cdef	87.44 (69.27)de	19.06 (25.91)d
Methyl demeton	0.02	81.51 (64.53)e	97.05 (81.29)	98.48 (83.71)	22.19 (28.08)e
Monocrotophos	0.03	80.08 (63.46)de	88.55 (70.84)efg	89.49 (71.10)e	21.57 (27.67)de
Thiometon	0.03	75.81 (60.53)c	86.38 (68.33)cdef	87.30 (69.18)de	18.59 (25.54)d
Carbosulfan	0.02	73.74 (59.15)b	81.28 (64.06)abc	82.70 (65.43)ac	16.61 (24.03)ab
Chlorpyrifos	0.02	72.25 (58.22)ab	80.39 (63.73)ab	81.70 (64.71)ab	15.90 (23.60)a
Fenitrothion	0.05	75.71 (60.47)c	84.65 (67.00)bcde	86.36 (68.36)cd	17.48 (24.72)bc
Phosalone	0.05	70.44 (57.06)a	76.70 (61.12)a	81.09 (64.24)a	15.76 (23.39)a
Quinalphos	0.03	75.09 (60.04)c	83.16 (65.53)bcd	85.16 (67.35)bcd	17.29 (24.57)bc
SEm ±		0.40	1.44	0.93	0.32
CD (P=0.01)		1.17	4.24	2.76	0.94

against *A. craccivora* on hollyhocks up to 22 days after spray. In the present study, the effects of the insecticides dwindled fast after 7 days of application, necessitating a repeat application. However, in the plots where methyl demeton, dimethoate and monocrotophos were applied, the aphid population declined by 20% over the control. Thiometon, formothion, fenitrothion and quinalphos were the next best and reduced the population by 17 to 19% over the control in 7 days. Carbosulfan, phosalone and chlorpyrifos could not reduce the aphid population substantially. Fenitrothion, phosalone and chlorpyrifos are good for short term aphid control. The former two are well known for their general safety to parasitic and predatory insects.

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