

USE OF SOME INSECTICIDES AND THEIR MIXTURES FOR CONTROL OF BRINJAL PESTS

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Insecticides vary in their spectrum of action on insects of different types and species. Hence it was considered possible to improve the efficiency of insecticidal application by mixing insecticides of varying spectra of action. Encouraging results using mixtures have been reported by workers like Jotwani and Sarup (1973), Hunter and Benter (1964), Jotwani (1967), Tripathi and Ghose (1967), Dochkova and Ghorgiev (1968) and Keaster (1968).

Brinjal (*Solanum melongena* Linn.) is subject to infestation by a variety of pests which include sucking pests, tissue borers and leaf-feeders. The present paper reports results of a field experiment conducted at the Agricultural College Farm, Vellayani, Kerala State during early 1972 to assess the relative efficacy of a few common insecticides when used alone and in combinations in controlling the different pests of brinjal.

Materials and Methods

Brinjal variety 'Pusa purple long' was used in the experiment. The seedlings were planted in a continuous formation with a spacing of 90 cm both ways. Each net plot consisted of 6 plants separated from other plots by a single row of border plants. There were 3 replications. Insecticides were sprayed first 20 days after transplantation and subsequently at fortnightly intervals, altogether completing six rounds. The spray fluid was used at 1.0, 1.5, 2.0, 2.5, 2.75 and 2.75 litres per treatment for the occasions 1 to 6 respectively. Screens were used to prevent drift of insecticides viciating adjacent plots. The details of insecticides used and their combinations and doses are given in Table 1. Results were assessed from fruit yield and counts of insects and/or insect damage at fixed intervals. Fruit borer population was assessed in terms of the holes found on the fruits.

Results and Discussion

Results are presented in Table 1. The data on the yield show that in general the best treatments are those of carbaryl and carbaryl phosphamidon which give the maximum increase in yield. Next in effectiveness is endrin-thiometon mixture followed by phosphamidon and phosphamidon - BHC mixture. The effect of the insecticides in controlling the fruit borer (*Leucinodes orbonalis*),

Table 1
Mean yield and mean insect counts per plot of brinjal under
different insecticide treatments

Insecticides and mixtures (ai. concentrations)	Fruit yield		Epilachna grubs	Mealy bugs	Fruit borers
	No.	Wt. (kg)			
Endrin 0.02% + thiometon 0.008%	47.00	7.2	29.3 (5.3546)	107 (3 263)	20.0 (4.340)
Malattvon 0.05% Fenitrothion 0.06%	40.00	6.6	30.3 (5.4973)	95.0 (9.685)	20.7 (4.495)
Carbaryl 0.05% + Phosphamidon 0.02%	56.70	7.5	20.3 (4.4980)	22.7 (4.672)	16.0 (3.924)
BHC 0.05 % Phosphamidon 0 02%	43.70	6.1	39.7 (6.2673)	201.7 (13.436)	27.3 (5.199)
Carbaryl 0 05% + BHC 0.05 %	33.70	5.2	40.3 (6.3503)	113.3 (10 364)	36.3 (6.007)
Thiometon 0.08 %	34.00	5.7	55.3 (7.4296)	86.7 (9.241)	35.3 (4.920)
Endrin 0.03%	35.00	5.2	46.3 (5.9663)	20.7 (4.532)	33.0 (4.479)
Malathion 0 1 %	40.00	6.3	41.0 (6.0766)	13.3 (3.268)	33.0 (5.666)
Fenitrothion 0.1 %	31.0	5.5	35.7 (5.8056)	118.3 (10.785)	21.7 (4.461)
BHC 0. 1 %	35.0	5.4	6.60 (8.0273)	206.7 (14.185)	43 7 (6.331)
Phosphamidon 0.04%	42.3	6.3	26.0 (4.3220)	71 7 (4.607)	20.7 (4.384)
Carbaryl 0.1%	54.7	8.0	17.3 (4.1583)	25.0 (4.672)	19.3 (3.924)
Control	28.8	3.7	93.0 (9.6001)	385.8 (19.339)	66.3 (8.007)
C. D,	11.40	1.83	(2.0684)	(4.059)	(1.773)

Note: Values in brackets are square-root transformations

which is a direct pest of the fruits, also follows roughly the same sequence as in the case of the yield. All the other treatments are ineffective both in respect of yield increase and in respect of the borer control. Carbaryl has been reported earlier by Thevasagayam and Canagasingham (1961) and Jotwani and Sarup (1963) as effective in controlling the fruit borer. Endrin by itself reported by Sreenivasan and Gowder (1959 a,b) as effective against fruit borer, does not compare well with the other treatments in the present case. For control of *Epilachna* grubs, (*Epilachnavigintioctopunctata*) among the different treatments under trial, the most effective are carbaryl and carbaryl - phosphamidon mixture followed by endrin - thiometon mixture. But now endrin is being phased out. Phosphamidon and malathion - fenitrothion mixture also give effective control of the insect. The efficiency of carbaryl against *Epilachna* grubs has already been established by previous workers like David (1963). Shi & Satpathy (1960) have reported endrin and malathion as effective against this pest.

For the control of mealy bugs *Centroccocus insolitus* the insecticides found effective are endrin - thiometon mixture, malathion, endrin, phosphamidon, carbaryl and carbaryl - phosphamidon mixture.

It is seen that mixing of insecticides is advantageous only in the case of endrin and thiometon in which, the mixture is much more effective in controlling the pests than its components. But as endrin is being phased out and is practically not available in the market, the above insecticides cannot be recommended.

In the light of the observations presented the insecticides which can be recommended for overall control of brinjal pests are carbaryl and phosphomidon in the order of descending efficiency.

Summary

A field experiment undertaken to compare the relative efficiency of some common insecticides and their mixtures in controlling the pest of brinjal showed that carbaryl, phosphamidon and carbaryl + phosphamidon, phosphamidon + BHC and endrin + thiometon gave effective protection to the crop from insect infestations in general. The only mixture which was found better than the components was that of endrin and thiometon. For an overall control of brinjal pests, carbaryl and phosphamidon in that order of preference have been recommended, taking into consideration of the decision of Government of India to phase out endrin by 1977.

സംഗ്രഹം

സാധാരണ ഉപയോഗത്തിലിരിക്കുന്ന ചില കീടനാശിനികളും അവയുടെ മിശ്രിതങ്ങളും ഉപയോഗിച്ച് പഴുതനട്ടുപ്പിയിൽ നടത്തിയ ഒരു പരീക്ഷണത്തിൽ, കാർബറിൽ,

ഫാസഫോമിഡോൺ, കാർബറിൽ-ഫാസഫോമിഡോൺ മിശ്രിതം, ഫാസഫോമിഡോൺ - ബി. എച്ച്. സി. ffilis.gnfOto എന്നിവ വഴുതനച്ചെടിയെ കീടബാധയിൽ നിന്നും ഫലപ്രദമായി സംരക്ഷിക്കുന്നു എന്നും കാണാൻ കഴിഞ്ഞു. മിശ്രിതങ്ങളിൽ, എൻഡ്രിൻ - തൈമരോൺ മിശ്രിതം അതിന്റെ ഘടകങ്ങളായ എൻഡ്രിൻ തൈമരോൺ എന്നിവയെക്കാൾ മെച്ചപ്പെട്ട വയെന്ന് കാണുകയുണ്ടായി. കാർബറിൽ ഫാസഫോമിഡോൺ ഇവയിലേതെങ്കിലും ഒന്ന് വഴുതനയുടെ കീടങ്ങൾക്കെതിരെ ശുപാർശ ചെയ്യാവുന്നതാണ്

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