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Field Efficacy of Certain Soil Applied Insecticides Against the Major Pests of Brinjal (*Solanum melongena* L.) Effect on Fruit Borer Infestation, Plant Height and Yield

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ABSTRACT

Soil application of systemics has shown that cytrolane could be effective against fruit borer (*Leucinodes orbonalis* Guen.) of brinjal. The order of efficacy of the different insecticides against the fruit borer was cytrolane> dimethoate> phorate> carbaryl. Increase in plant height was evident in all insecticidal treatments, cytrolane and phorate being more effective in this respect. Of the four granular insecticides tried, dimethoate recorded higher yields to the extent of 47.72 per cent over control.

Soil application of granular insecticides for vegetable crops has become an accepted practice for the control of pests. The efficacy of granular insecticides has been well documented by a few earlier workers (Anbarasan, 1972; Uthamasamy *et al.*, 1973) in chillies and brinjal. The present paper deals with the results obtained on the effect of soil applied carbaryl, dimethoate, cytrolane and phorate against the fruit borer (*Leucinodes orbonslis* Guen) incidence and on the growth and total yield of brinjal plants.

MATERIALS AND METHODS

Field trial was conducted during 1973-74 in the Orchard area of Annamalai University, Annamalainagar, Tamil Nadu. The trial was laid out in a split plot design with five main treatments and three subtreatments. The main and sub plots measured 21'×15' and 15'×6' respectively. There were three replications for each treatment. Four granular insecticides *viz.*, phorate 10G, cytrolane 5G, dimethoate 3G, and carbaryl 4G at the rate of 1.0, 1.5 and 2.0 kg a. i/ha were applied.

Forty days old seedlings of the ariety 'Annamalai' were transplantede at the rate of 20 plants in each sub plot in two lines. Calculated amounts of the granules were applied as basal dressing on the 30th day after transplanting. The second application was done 30 days after the first application. The granules were

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uniformly applied around the plants in small circular furrows opened 5 cm away from the plant at a depth of about 5 cm and then covered with soil followed by irrigation.

For recording the fruit borer incidence the total number of harvested fruits and the total number of affected fruits per plot were counted and the percentage of incidence was worked out for every picking of fruits. Observation on plant height was taken at the rate of 5 plants in each sub plot and a total of three observations were made during the crop growth with an interval of 30 days to assess the influence of insecticides on yield. Fruits were picked at seven days interval from each treatment and the total number and weight of the fruits were recorded in all the pickings.

RESULTS AND DISCUSSION

The efficacy of insecticides against the fruit borer is furnished in Table 1. The over all reduction of the incidence of fruit borer due to the insecticide treatments was only 15.07 per cent over untreated check. However, significant reduction in fruit borer incidence was noted among insecticides irrespective of its dosages. Among the different insecticides tested maximum reduction of 21.74 per cent was obtained with cytrolane as against 17.48, 11.91 and 9.17 per cent with dimethoate, phorate and carbaryl respectively. There was no significant difference between the dosages irrespective of chemicals. The efficacy of cytrolane in the control of borer pests has been amply explored by various workers (Luz, 1968). True to a good systemic, cytrolane seems to persist longer in biologically active amounts to be effective against fruit boring caterpillars.

All the insecticides tested have increased the plant height to varying degrees over the control during the period of observation (Table 2). Increase in plant height by application

TABLE 1. Effect of granular insecticides on the percentage incidence of fruit borer (Transformed values of the mean of 15 observation)

Treatments	Dosages kg a. i./ha			Mean	% decrease over control
	1.0	1.5	2.0		
Phorate	40.44	32.45	29.48	34.12	11.91
Cytrolane	28.20	26.18	36.55	30.31	21.74
Dimethoate	32.41	36.65	26.92	31.96	17.48
Carbaryl	34.83	36.57	34.14	35.18	9.17
Control	38.33	38.80	39.08	38.73	—
Mean	33.96	32.96	31.77		
C. D. (For treatments)		0.782			
C. D. (For treatments X dosages)		17.15			

TABLE 2. Effect granular insecticides on plant height (Mean of 45 observations in cm.)

Treatments	Height in cm			% decrease over control		
	30 days	60 days	90 days	30 days	60 days	90 days
Phorate	26.66	34.88	44.88	33.36	23.12	25.25
Cytrolane	26.99	39.88	48.38	30.01	40.77	35.01
Dimethoate	24.55	31.66	49.22	22.81	11.76	37.42
Carbaryl	22.83	28.65	40.11	14.20	1.13	11.94
Control	19.99	28.33	36.83			
C. D.	3.454	1.351	1.158			

of systemic granular insecticides has been reported by many workers (Sithanantham, 1968; Judenko 1969 and Uthamasamy *et al.*, 1973). Significant effect was recorded among dosages of insecticides.

Insecticidal treatments have resulted in increase in the number as well as weight of fruits (Table 3). There was however, no correlation between the number and weight of fruits. The relative order of efficacy on the basis of yield was dimethoate > cytrolane > phorate > carbaryl. Increase in yield due to soil application of insecticides has been reported by many workers for various crops (Guyer *et al.*, 1960; Harding, 1962; Uthamasamy *et. al.*, 1973; Baskaran and Jotwani, 1974

TABLE 3. Effect of granular inseticides on the number and yield of fruits (Mean of 9 observations)

Treatments	Number of fruits/plot	% increase over control	Yield in g/plot	% increase over control
Phorate	45.86	52.81	924.65	37.24
Cytrolane	55.33	85.71	969.00	42.04
Dimethoate	51.22	71.42	1021.66	47.72
Carbaryl	44.44	48.73	852.33	29.42
Control	29.88	—	580.32	—
C. D.	3.05	NS	11.69	NS

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