

Granular Insecticides for the Control of Pod Borers in Red Gram

BY

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ABSTRACT

Two field experiments were conducted during 1971 and 1972 with granules and dust formulations for the control of redgram pod borers with 11 treatments in Experiment No. 1 and 12 treatments in Experiment No. 2. The granules were incorporated in the soil at the rate of 1.25 kg a.i./ha as a side dressing 45 days after sowing of the crop. The dusts were applied at the same rate on the plant at the time of flowering of the crop. The mean injury percentage to pods ranged from 25.0 to 44.0 in experiment No. 1 and was statistically significant. Treatments with phorate 10% gr., bux 10% gr., dimethoate 1% gr., fensulphothion 5% gr. and aldicarb 10% gr. registered a marked reduction in infestation of 43.2, 36.1, 28.4, 26.6 and 21.4 per cent respectively. In experiment No. 2 treatments with bux 10% gr., fensulphothion 5% gr., disulfoton 5% gr., carbophenothion 5% dust and cytolane 10% gr. recorded lower infestation 25.6, 23.2, 20.6, 20.6 and 18.2% less than control respectively. Regarding yield, cytolane 10% gr., disulfoton 5% gr., bux 10% gr., fensulphothion and phorate registered consistently higher yield in both the experiments.

INTRODUCTION

Successful control of fruit boring insects in cotton and bhendi (Okra) by granular insecticides applied to the soil have been demonstrated by Swamiappan (1969) and Palaniswamy (1971) respectively. Thus the possibility of extending the use of granules of insecticides in the soil for the pod borers of red gram which have not so far been successfully controlled became apparent.

Red gram pods are subject to the attack of eight borers important among

which are *Heliothis armigera* Hb., *Maruca testulalis* G. and *Melanagromyza obtusa* M. These insects take a toll ranging from 25.0 to 40.0 per cent or more of the seeds. Attempts have been made to suppress the pests with various dust formulations suitable for use in dry areas. However, satisfactory control of pests have not so far been achieved. Since the granular formulations of many systemic and other insecticides are now available, trials were undertaken to evaluate the efficacy of these chemicals incorporated in the soil against the red gram pod borers.

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MATERIALS AND METHODS

During 1971 and 1972 seasons field experiments were laid out at Agricultural College and Research Institute, Coimbatore, with granular and dust formulations of some of the systemic and other insecticides for the control of the pod borers of red gram. These were laid out in random block design with 3 replications with 11 treatments in Experiment No. 1 in 1971 and 12 treatments in Experiment No. 2 in 1972. The plots for the treatments were 4x2.5 meters in extent with a spacing of 30 cm between plants and 60 cm between rows. The granules were incorporated into the soil at the rate of 1.25 kg a.i./ha as a side dressing 45 days after sowing of the crop. The dusts were applied at the same rate on the plant at the time of flowering of the crop. In the 1st experiment Co 1 red gram variety was sown on 26-8-71 and the treatments were granules of phorate (Thimet) 10 per cent, Bux 10 per cent, dimethoate (Rogor) 1 per cent, fensulphothion (Dasanit) 5 per cent, aldicarb (Temik) 10 per cent, carbaryl (Sevin) 2 per cent, cytolane 10 per cent, disulfoton (Disyston) 5 per cent, chlorphenamidine (Galecron) 3 per cent, and quinalphos (Ekalux) 5 per cent, against a control of no treatment. In the second experiment SA 1 variety of red gram was sown on 4-11-72 and the treatments were granules of Bux 10 per cent, fensulphothion 5 per cent, disulfoton 5 per cent, cytolane 10 per cent, phorate 10 per cent, carbaryl 2 per cent, aldicarb 10 per cent and dimethoate 1 per

ent and dusts of carbophenothion (Trithion) 5 per cent, endosulfan (Thiodan) 4 per cent and carbaryl (Sevin) 10 per cent against control as before. Counts of healthy and borer affected pods were made on 5 plants marked out at random in each plot in 3 branches every fortnight from the time of formation of pods to their harvest. The yield of healthy seeds was recorded in each plot.

RESULTS AND DISCUSSION

The results obtained in both the experiments are presented in Table I a and b.

Experiment No. 1

The mean percentage injury to pods ranged from 25.0 to 44.0. It is noted that all the insecticidal treatments had suppressed the borer injury compared to control. Phorate and Bux registered the lowest infestation of 43.2 and 36.1 per cent less than control. Yield of seeds in plots ranged from 233 to 736 kg/ha in the insecticidal treatments compared to 288 kg/ha in control. The data were commuted according to the analysis of co-variance method which stood up to statistical scrutiny. Fensulphothion, aldicarb, phorate and cytolane gave 6.64 to 5.20 times the yield of control.

Experiment No. 2

The mean percentage injury to pods ranged from 25.3 to 34.0 which proved to be significant statistically. Again all insecticidal treatments had lesser percentage injury by pod borers compared to control. Bux and fensulphothion proved

better than the others with 25.6 per cent and 73.2 per cent lesser infestation compared to control. Yield of seeds in plots from 269 to 922 kg/ha in the insecticidal treatments compared to 269 kg/ha in the control. The data commuted as before gave significant results. Cyrolane, disulfoton, bux, phorate and fensulfotion gave 4.94 to 3.54 times the yield of control.

Considering the mean of the two experiments (Table 1 c) it could be stated that granules cytolane 10%, disulfoton 5% and bux 10% which have give considerably increased yields while keeping down the pod borers could be adopted for package programmes in red gram. Also carbaryl 10 per cent dust or 2 per cent granules, phorate 10% granules and fensulfotion 5 per cent granules could be used since they have also given comparatively higher yields.

Thus the present study has provided ample proof that the granules of non systemic or systemic insecticides incorporated in the soil once 45 days after sowing of red gram could give prolonged action of the insecticides inhibiting the appearance of the devastating pod borers of the crop.

Further, increase in yield due to treatments with various insecticides have been reported from time to time and thus Linke (1964) showed an increase of 78.9 per cent in carrot with granular disyston treatment, an increase of 11.5 bushels per acre in wheat by the use of phorate and disulfoton by Bigge *et al.* (1965). David and Narayanswamy (1963) and Harding and Wolf-

enbarger (1963) were of the opinion that insecticidal treatments on bengal gram and cowpea by the former and turnip and cabbage by the latter stimulated growth and were conducive in promoting yields. The present experiments bear out this fact impressively. The high yields obtained in all the treatments two fold in first experiment and three fold in the second experiment indicate that these chemicals could be used for their fertilising or stimulatory effects on plant to step up yields.

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