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Efficacy of Different Concentrations on Sevin Dust Against Red Pumpkin Beetle (*Aulacophora foveicollis* (Lucas) Causes Damage to Muskmelon (*Cucumis melo* L.) Crop

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Abstract: The results reveal that sevin dust at high concentrations (2.0%) gave the best control of the pest followed by media (1.0%) and low (0.5%) concentrations. High and medium concentrations were found non-significantly different in control of the pest. Low concentration of Sevin dust also found significantly better in reduction of pest population, compared to the zero concentration.

Key words: Sevin dust, *Aulacophora foveicollis*, Muskmelon

Introduction

Muskmelon (*Cucumis melo* L.) is commonly grown in Pakistan, particularly in D.I.Khan, Tank and Bannu as cash crop. It is a cheap and rich source of vitamins A, B, C and minerals. It is attacked by a number of insect pests, among them Red pumpkin beetle, Hudda beetle, Fruitflies, Jassids and Aphids are the most destructive. These are not only adversely affecting its production but also its quality and market value.

Red pumpkin beetle (*Aulacophora foveicollis* (Lucas)) is the most destructive one among the above mentioned insect pests of muskmelon. Damage to the crop is being done by the grubs as well as by the beetles. The grubs bore into the roots and creepers which ultimately die. Adult beetles cause defoliation of the plants, which some what range upto 100 percent. This notorious pest attacks the young seedlings so severely that growers have to resow the crop (Atwal, 1976).

Makhdoomi and Ishaq (1970), tested Sevin, Heptachlor and Dipterex at the ratio of 1.0 b a.i. ha⁻¹ for the control of *Aulacophora foveicollis* (Lucas) on pumpkin crop in Punjab, Pakistan. The insecticides were applied thrice at 10 days interval and data were recorded 48 hours after treatment. According to them, the highest test mortality of 90.68 percent was recorded in the Sevin followed by Dipterex (83.41 %).

Makhdoomi *et al.* (1973), conducted experiment using Acetelic, Phosvet, Noxagon, Azodrin, Kilval, Nixion, Gardona, Supracide, Dimecron, Nuvacron and Sevin for the control of *Aulacophora* followed by Azodrin (90.50%). Singh and Mishra (1977) evaluated the effectiveness of 8 insecticides for the control of *A. foveicollis* on muskmelon. They concluded that 0.1 percent Carbaryl gave the best results. Ghani and Ahmad (1980) recommended dust application of Sevin and ash at the ratio of 1/2 : 20 parts in early morning for the control of *A. foveicollis* after germination of crop.

Hussain *et al.* (1981) recommended dust mixture of Sevin and ash in the ratio of 1:20 for the control of melon pests. Khan *et al.* (1985) reported that *A. foveicollis* attacks the

melon crop after germination and feeds on small tender leaves. According to them Sevin dust 350 g mixed with ash in the ratio of 1:15 and dusted in the morning when there was dew drops on the plants found effective for the control of this pest.

Mavi and Bajwa (1985) conducted field trial in Punjab India for the control of *A. foveicollis* on muskmelon. They applied 6 insecticides, 3 times with knapsack sprayer. According to them spray of 0.50-0.5 percent Carbaryl gave the best results and remained effective for 7-10 days. Permethrin, Phoxin and Pirimiphosmethyl at 0.75 percent were the next most effective insecticides.

Bajwa and Mavi (1988) carried out a field trial in Punjab, India to determine the effectiveness of low volume concentrations of Carbaryl (Dicardun) and Fenitrothion (Folthion 1000 ULV) each at the rate of 25-500 g ha⁻¹ applied 3 times (17, 24, 34) days after sowing with "Fogair" hand operated sprayer against red pumpkin beetle on muskmelon. They concluded that higher rates of both insecticides provided effective control of the pest upto 10 days as compared with one week with lower dosage.

Pareek and Kavadia (1988) tested insecticides in two climatic regions (semi-humid and semi-arid) of Rajasthan, India against *Aulacophora* spp and *Dacus cucurbitae* on muskmelon. Carbaryl at 0.2 percent applied 3, 5, 9 and 11 weeks after sowing provided the most effective control of both pests and increased the yield (79.89 kg ha⁻¹) compared to control.

Keeping in view the economic losses caused by red pumpkin beetle to muskmelon the present studies were initiated to find out an appropriate concentration of Sevin dust for its control.

Materials and Methods

The control trial against red pumpkin beetle *Aulacophora foveicollis* (Lucas) was conducted at the farm of Faculty of Agriculture, Gomal University, D.I.Khan. Sevin dust in three different concentration (2.0, 1.0 and 0.5%) was used as insecticide.

Muskmelon variety Bukhara was sown in sub plots

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measuring 4 × 5 square meter each with row to row and plant to plant distance 180 and 60 cm respectively according to the method of Khan and Khattak (1992). Two seeds per hill were planted. After germination thinning was done to leave one seedling per hill. All agronomic practices were carried out at par in all of the treatments. Half of the recommended doses of fertilizers were applied with first irrigation to the crop and remaining half at the time of fruit setting.

The experiment was conducted in RCBD with 4 replications. The three concentrations of Sevin i.e. 0.5, 1.0 and 2.0 percent were applied against R.P.B. just after their visibility in the field. Dilution of 10 percent Sevin to the above mention concentrations was done by mixing ash with it. Dusting was done in the morning with help of muslin cloth. The experiment was repeated 4 times with interval of 10 days. Data was recorded on the basis of o. of RPB per plant after one three, five and seven days of dust application. The data obtained were subjected to the statistical analysis and the differences among the means were tested by DMR test.

Results and Discussion

Results of application of three different concentrations of Sevin dust for the control of Red Pumpkin Beetle *A. foveicollis* are presented in Table 1.

Data recorded after one day of treatment show that high and medium concentrations reduced the pest population to zero per plant and were found non-significantly different from each other in control of the pest. Low concentration of Sevin dust reduced the pest to 1.73 per plant and found significantly less effective than high and medium concentrations, but was found significantly effective compared to zero concentration as 4.91 RPBs per plant were recorded in the untreated plots.

Results obtained after three days of Sevin dusting show that high concentration was found most effective in the control of the pest followed by medium and low concentrations. ON An average 0.04, 0.34 and 2.18 RPBs per plant were recorded in the plots treated with these concentrations. High and medium concentrations were

found significantly more effective than low concentration. However, low concentration was found significantly better in the control of the pest compared to the zero concentration as 5.00 RPBs per plant were recorded in the untreated plots.

Data obtained after five days of treatment indicate that high and medium concentrations were found significantly most effective in control of the pest as on an average of 0.30 and 0.50 RPB per plant were recorded in plots treated with these concentration. Low concentration was found significantly less effective than high and medium concentrations as on an average of 2.61 RPBs per plant were recorded in the plots treated with low concentration. However, this concentration was found significantly effective in control of the pest compared to the zero concentration as on an average 5.36 RPBs per plant were recorded in the untreated plots.

After seven days of dusting on an average 3.32, 2.45, 2.03 and 6.28 RPBs per plant were recorded in low, medium, high and zero concentration of Sevin respectively. The data reveal that high concentration was the most effective in control of the pest, followed by medium and low concentration. High and medium concentrations were found non-significantly different from each other. Medium and low concentration were also found non-significantly different in control of the pest at 1 percent level of probability. All of these concentrations were found significantly effective in control of the pest compared to zero concentration.

These results more or less similar to the results obtained by Makhdoomi and Ishaq (1970), Makhdoomi *et al.* (1973), Singh and Mishra (1977), Khan *et al.* (1985) and Pareek and Kavadia (1988), who also achieved effective control of red pumpkin beetle with application of Sevin (Carbaryl). Our results can not be compared stickly with the results recorded by the above mentioned workers because of difference in formulation of insecticide and its application method as well as climatic conditions of the regions where they conducted their experiments. However, Ghani and Ahmad (1980) recommended Sevin dust and ash mixture at the ratio 1/2:20 and Hussain *et al.* (1981) recommended mixture of Sevin'dust and ash at the ratio 1 :20 for the control of red pumpkin beetle on muskmelon.

Table 1: Effect of different concentrations of Sevin dust on of Red Pumpkin Beetles population per plant recorded after different durations of treatment

Treatments	Data recorded after different durations			
	One day	Three days	Five days	Seven days
0.5 Percent Sevin dust.	1.7313	2.18 B	2.61 B	3.32B
1.0 Percent Sevin dust.	0.00 C	0.34 C	0.50 C	2.45 BC
2.0 Percent Sevin dust.	0.00 C	0.04 C	0.30 C	2.03 C
Control	4.91 A	5.00 A	5.36 A	6.28 A

Means followed by same letter/letters do not differ significantly from each others at 1 percent level of probability

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