

# Management of pumpkin beetle in cucurbitaceous crop: A review

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## Abstract

Among all the Coleopteran insect pests red pumpkin beetle (*Aulacophora foveicollis*) is the major one in cucurbitaceous crop. It is capable to cause 30 to 100% yield losses in various cucurbits crops. There are different chemicals which are effective for the management of red pumpkin beetle in cucurbitaceous crop. Different researcher reported that the application of chemicals like carbaryl, monocrotophos most effective against red pumpkin beetle. Carbofuran @ 0.5% a.i./ha as soil application are found to be most effective for red pumpkin beetle during seedling stage. Soil application and seed treatment of carbofuran in granules form has found most effective against red pumpkin beetle without any side effects on seed germination in muskmelon and bottle gourd.

**Key words:** Beetle, Management, cucurbits, carbaryl, monocrotophos, carbofuran

## Introduction

Cucurbitaceous are the most common and important vegetable crops in India and have good nutritional and medicinal value. There are numbers of insects which attacks on cucurbitaceous crop. Among those insects *A. foveicollis* is the major insects of cucurbitaceous crop. It is capable to cause 30 to 100% yield losses in various cucurbits crops (Gupta and Verma, 1992). Doharey, (1983) reported more than 81 plant species includes Pumpkin, snake gourd, squash, bitter gourd, water melon, sweet gourd, cucumber, bottle gourd etc. Singh *et al.*, (2000) reported that the minimal damage caused by red pumpkin beetle in bitter gourd (*Momordica charatia*) and on the other hand bottle gourd (*Lagenaria siceraria*), cucumber (*Cucumis stivus*), muskmelon (*Cucumis melo*) and long melon (*Cucumis utissimus*) were highly preferred as a host. Both adult and grub stage of red pumpkin beetle attacks the crops. The adult of red pumpkin beetle feeds on leaves, flowers and buds of flower where as the larvae feed on root tissues and newly developed seedlings (Narayanan and Batra, 1960) and hence it necessary to reduced the pest population to increase the production of cucurbitaceous crops.

## Damage Caused by Grub and Adult

It is reported by the defferent researcher that both grub and adult can cause damage to the cucurbits crops either by feeding on the leaves by the adult or by feeding on the roots by the grub stages.

## Management of Red Pumpkin Beetle

Red pumpkin beetle are the major insect of cucurbitaceous crop and can damage 100 per cent yield loss in the crop. Due to their higher loss in the crop it is very important to manage. The chemicals like carbaryl, Phosphomidon, carbophenathion and endosulfan are most effective control against red pumpkin beetle (Kumar and Lal. 1966). Carbaryl followed by Endosulfan, Phosphomidon and Trichlorphoron also gave the most

effective control (Azim, 1966). The insecticides which are in dust form like BHC (1%), DDT (10%), Malathion (2%), Endrin (1%) and Parathion (2%) are most effective as compared to sprays for 48hrs (Pandey *et al.*, 1972). If we use carbofuran as flowable power or wettable formulation at 3 to 4 percent as seed treatment then it gave the effective control measures (Sinha and Chakarbarti 1980). Among the insecticides, including Lindane at 0.2 percent, Carbaryl and dichlorvos, Monocrotophos, phosalone, methyl demeton and thiometon at 0.3 percent the Phosphomidon followed by carbaryl and endosulfan have effective control. It reduces the 64 percent population of red pumpkin beetle (Dabi *et al.*, 1980).

Experiment was conducted in Ludhiana, Punjab by Singh in 1981 to test the different dosages of Phorate 10 percent granules and Carbofuran 3 percent in a singal application is effective to reduced pumpkin beetle in muskmelon. The dosages of 750gm and 1500gm of Carbofuran/ha were applied in the soil during transplanting around the base of the plants and crop was irrigated. The result revealed that a single soil application with Carbofuran @ of 200gm/ha gave the better control as compare to other dosages. The experiment was performed by Mavi and Bajwa in 1984 for the control of red pumpkin beetle. They used four different insecticide which was applied to muskmelon crop by using battery operated sprayers. They observed that, the chemicals Pirimiphos-methyl and Phoxim were most effective when applied at higher concentration as compare to others. Preek and Kavadia (1988) conducted field experiments to evaluate some insecticides against *A. foveicollis* in two agro climatic regions (semi humid and semi arid). The agrochemicals are dicofol @ 0.1%, Malathion @ 0.5%, ethion @ 0.05% toxaphene @ 0.1%, chlorpyrifos @ 0.05%, phosalone @ 0.035%, endosulfan @ 0.07%, and dimethoate @ 0.03%. Carbaryl gave the most effective results against the red pumpkin beetle. On the other hand the chemicals phosalone and dimethoate were found to be an effective control with higher benefit/low cost ratio. Khattak and Khan in 1992 evaluate the efficacy of different agro-chemicals against *A. foveicollis* on muskmelon crop. The research scheme was based on 5 different chemicals, including stinger, cypergard, sunmerin, marvrik and cropgard. They were tested three different concentrations of each of 5 chemicals against the red pumpkin beetle. At last during the results cypergard was found to be the most effective control at each concentration as compared to the other chemicals. And the data were collected by counting the number of red pumpkin beetle/plant.

Lakshmi *et al.*, (2005) conduct an experiment to check the effectiveness of different chemicals, one botanical and one biological control eirher in sole or in combination for the management of red pumpkin beetle. The results revealed that application of carbaryl was found to be the effective one in reducing the beetle population upto 46% and also leaf damage by 10 %) followed by Monocrotophos (39.93%) and Nimbecidine (28.66%). Rahaman and prodhan (2007) studied the effect of synthetic pesticides and net barrier on the red pumpkin beetle and found that the zero infestation in case of net barrier and carbofuran also gave the effective results. The soil treatment with carbofuran at the rates of 500g a.i. /ha at the time of sowing gave the effective results (0.93 beetle /plant). Rai *et al.*, conducted a study in 2008 in different vegetables and cucurbitaceous crops. During their study, they found that the red pumpkin beetle is the serious pest of cucurbitaceous vegetable and recommended 0.1% Malathion and 0.1% carbaryl for its control.

The three crops were tested viz. bitter gourd (Var. Hybrid Nepali), sweet gourd (Var. BARI sweet 5 gourd 1), and bottle gourd (Var. Kajla) against *A. foveicollis* by Hasan *et al.*, in 2010 by using Malathion at three concentration (0.4%, 0.5% and 0.6%). They found that the doses at the rate 0.4% were less effective and 0.5% was highly effective. An experiment performed by Osman *et al.*, in (2013) to study the effect of different botanicals, Bishkatali leaf extract, Mehagoni oil, Neem oil and chemicals, Diazinon and Larvin 75 WP against *A. foveicollis* on bottle gourd variety BARI Lau-4. The effectiveness of each treatment was evaluated on the basis of red pumpkin beetle population/plant and infestation in leaf area at 24, 48, 72 HAT (hours at treatment) and 7 DAT (day after treatment) in the field. Since, the effect of chemical insecticides, Diazinon 60 EC and Larvin 75 WP were found to be most effective for reducing the red pumpkin beetle population as compared to the botanicals.

The Bio efficacy of ready made mixed formulation against red pumpkin beetle in cucumber crop was evaluated by Sharma *et al.*, 2018. The result revealed that the chemical spray carbaryl (sevin 50 WP) at the rate 1.5 gm/L followed by Cyperkill 10 EC at the rate 0.75ml/l mixed with 10 gm of gur/l with combi DT (Deltamethrin and triazophos) at the rate 1ml/l at the 15 days interval was the most effective control against red pumpkin beetle.

### Conclusion

The red pumpkin beetle (*A. foveicollis*) is the major pest of cucurbitaceous crops all over india and in other contries. The management at specific time is most important as insect cause upto 100 percent of damage in some crops. So, the application of Carbaryl as soil application is the most suitable and effective methods for the management of the above said pests. Some biopesticide and botanicals like Bishkatali leaf extract, Mehagoni oil, Neem oil are also showed good result for the management.

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