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Evaluation of Diafenthiuron 50 SC (polo) against grape mealy bug *Maconellicocuss hirsutus* (Green)

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ABSTRACT
A field experiment was conducted at Regional Agricultural Research Station/Horticulture Research Station Bijapur, during 2004-05 in randomized block design with 8 treatment combination and was replicated four times. Different dosages of diafenthiuron 50 SC were tried against grape Mealy bugs*Maconellicocuss hirsutus.* Among the different different levels of concentrations Diafenthiuron 50 SC @ 800 g.a.i./ha and 1600 g.a.i./ha given higher yield of 9.1 and 9.2 kg./vine respectively with higher C:B ratio of 11.1 and 11.4 respectively Increasing the concentration of chemical reduced the Mealybug population.

Key words : Mealyfug, Maconellicoucuss hirsutus, Diafenthiuron, Grape.

INTRODUCTION

Grape (*Vitis vinifera.* L.) is one of the important fruit crop grown in tropical and subtropical regions of the world. It is an important commercial horticultural fruit crop next only to citrus and is gaining important in Indian horticulture. It not only brings foreign exchange through exports but also provides employment both directly and indirectly to a larger number of peoples. In India it is grown approximately in 34,000 ha. Grape is prone to many no of pests among them Mealy bug (*Maconellicocuss hirsutus* (Green) is most important affecting the grape vine stem, leaves and fruit parts. *M hirsutus,* the hibiscus, pink, or grape Mealy bug, is indigenous to tropical Africa, Oriental Asia, and northern Australia. It was reported from the Western Hemisphere in Grenada, in November 1994, and is now reported from Barbados and Trinidad and Tobago. This is serious economically important pest, feeds on more than 125 different plants, including citrus, plum, grape, cotton, and soybeans. Hibiscus Mealy bug emits toxic saliva which kills young shoots on its host. Large infestations have resulted in 50-100% mortality of grape in India. The incidence of Mealy bug will be noticed throughout the year, but more serious during October to march (Balikai, 1999a, Mani 1998) causing losses in both quality and yield. Thus the present study was taken to study was taken to study the performance of a new molecule Diafenthiuron 50 SC against grape Mealy bug on Thompson seedless cultivar of grape.

MATERIALS AND METHODS

A field experiment was conducted during 2004-05 at Regional Agricultural Research station/horticultural Research Station, Bijapur (HRS) in a randomized block design, with eight treatments and four replications. Treatments were imposed at peak level of pest (Mealy bugs) incidence which coincided with new vegetative growth and flowering after October pruning. Observations on number of Mealy bug colonies/vine (*M. hirsutus*) were taken at one day before spraying, five days and ten day after spraying. The treatment comprising of various concentrations of Diafenthiuron 50 SC viz., 300, 400, 500, 600, 800 and 1600 g.a.i./ha were evaluated as against standard check treatment i.e. spraying of Diamethoate 30 EC followed by Monocrotophos 36 SL @ 1.7-1.0 ml./lit and untreated control. Fifteen days after first spray, second spray was made as per the treatment details by using 500 to 800 litres of spray solution/hectare and observations were recorded same as above.

Grape berry yield/vine was also recorded and computed to hectare basis. Finally the cost : benefit ratio was worked out to known the superiority of treatments.

The data obtained thus were subjected to appropriate statistical tests.

RESULTS AND DISCUSSION

There was no significant difference in the number of Mealy bug colonies/vine among different treatments one day before first spray. The mean population of the Mealy bugs varied between 7.3-8.7 colonies/vine. Five days after first spray, the plots treated with Diafenthiuron 50 SC @ 1600, 800 and 600, 500 and 400 g.a.i./ha

Table 1 : Biofficacy of Diafenthiuron 50 SC against grape mealy bug (*Maconellicoccus hirsutus*)

Treatments	Mealy bug colonies/vine					
	After first spray			After second spray		
	1DBS	5DAS	10DAS	1DBS	5DAS	10DAS
1. Diafenthiuron 50 SC (Polo) @ 300 g.a.i./ha	7.7	5.0	4.7	5.0	3.3	2.0
2. Diafenthiuron 50 SC (Polo) @ 400 g.a.i./ha	8.0	1.3	1.0	2.8	1.7	1.7
3. Diafenthiuron 50 SC (Polo) @ 500 g.a.i./ha	8.0	1.3	1.0	2.7	1.0	0.3
4. Diafenthiuron 50 SC (Polo) @ 600 g.a.i./ha	7.7	1.0	0.3	2.0	0.3	0.0
5. Diafenthiuron 50 SC (Polo) @ 800 g.a.i./ha	7.3	0.3	0.7	4.3	0.0	0.0
6. Diafenthiuron 50 SC (Polo) @ 1600 g.a.i./ha	8.0	0.3	0.7	4.3	0.0	0.0
7. Standard insecticide at recommended dose (Dimethoate – Monocrotophos 1.7-1.0 ml./lit of water respectively)	8.0	1.3	1.7	4.3	2.0	1.0
8. Untreated Control	8.7	8.7	8.3	6.7	5.7	4.0
Sem +/-	-	0.4	0.3	0.6	0.5	0.3
C.D. (5%)	NS	1.3	1.0	1.7	1.3	0.9

DAS = Day/s after spray DBS = Day/s before spray

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Table 2 : Effect of Diafenthiuron 50 Scon grape (berry) Yield and C:B ratio.

Treatments	Yield		
	Kg/vine	Ton/ha	C:B ratio
1. Diafenthiuron 50 SC (Polo) @ 300 g.a.i./ha	6.2	16.9	3.3
2. Diafenthiuron 50 SC (Polo) @ 400 g.a.i./ha	7.3	19.7	6.1
3. Diafenthiuron 50 SC (Polo) @ 500 g.a.i./ha	7.7	21.0	7.4
4. Diafenthiuron 50 SC (Polo) @ 600 g.a.i./ha	8.5	23.1	9.5
5. Diafenthiuron 50 SC (Polo) @ 800 g.a.i./ha	9.1	24.7	11.1
6. Diafenthiuron 50 SC (Polo) @ 1600 g.a.i./ha	9.2	25.0	11.4
7. Standard insecticide at recommended dose (Dimethoate – Monocrotophos 1.7-1.0 ml./lit of water respectively)	8.3	22.5	8.9
8. Untreated Control	5.0	13.6	-
Sem +/-	0.3	-	-
C.D. (5%)	0.9	-	-

recorded significantly minimum number of Mealy bug colonies (0.3-1.3/vine) and were found on par with the standard check treatments i.e. spraying of dimethoate 30 EC @ 1.7 ml/lit of water followed by monocrotophos 36 SL @ 1.0 ml/lit ten days after first spray application of Diafenthiuron 50 SC @ 400, 500, 600, 800 and 1600 g.a.i./ha was found superior by recording minimum population of Mealy bugs (0.3-1.0 colonies/vine) and were found on par with standard check treatment. (Table 1).

One day before second spray, there was a significant difference with respect to population of Mealy bugs because of residue/continued effect of different treatment until Ten days after first spray. Five days after second spray the plots sprayed with Diafenthiuron 50 SC @ 1600 and 800 g.a.i./ha no incidence significantly minimum population of Mealy bugs/vine was noticed in the plots treated with Diafenthiuron 50 SC @ 600 and 500 g.a.i./ha. Similar trend was continued at ten days after second spray. Higher dosage of chemical recorded the significantly minimum number of Mealy colonies/vine. (Table 1) the present results corroborates with the findings of Balikai, 1999b, who reported the excellence of new molecules (methomyl 24L) against grape Mealy bugs.

Significantly higher berry yield was recorded in the plots sprayed with Diafenthiuron 50 SC @ 1600 g.a.i./ha (9.2kg/vine) and found on par with Diafenthiuron 50 SC @ 800, 600 g a.i./ha (9.1 and 8.5 kg/vine respectively) as against standard check treatment and untreated control (8.3 and 5.0 Kg/vine respectively).

The treatment viz. Diafenthiuron 50 SC @ 600, 800 and 1600 g.a.i./ha were found significantly superior by registering minimum population of Mealy bugs, maximum berry yield (8.5, 9.1 & 9.2 kg/vine respectively), which intern influences the higher C:B ratio (Table 2). The lower dosages of Diafenthiuron 50 SC (i.e. @ 500 and 600) were also efficient by recording good control of mealy bugs and recording higher berry yield (7.7 and 7.3 kg./vine) and were also comparable with standard check treatment. Hence Diafenthiuron 50 SC @ 600/ 500 g.a.i. ha can used for the effective control of Mealy bugs in grape ecosystem.

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