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Management of epiphytes on mango tree trunk

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Abstract

The field experiment has been conducted for three years to study the effects of various modes of treatments to control the epiphytes of mango crop. The significant death of leaflets was observed in the treatments of Mechanical removal and Paraquat dichloride 24% SL @ 0.15% with 100 and 98.56% inhibition, respectively. These two treatments were significantly superior over rest of the treatments in controlling *Pyrrhosia lanceolata* epiphyte on mango. These were followed by the treatments of Copper sulphate @ 1% and Sodium Chloride @ 6% with 88.82% and 82.90% inhibition respectively. The treatments of Sodium chloride @ 4%, Copper sulphate @ 0.1%, Copper sulphate @ 0.2%, Copper sulphate @ 0.3% were moderately effective in inhibiting the leaflets of epiphytes. All other treatments viz., Copper Hydroxide @ 0.3%, Glyphosate 41% SL @ 0.1% and Butter milk @ 10% were found ineffective.

Keywords: *Pyrrhosia lanceolata*, copper sulphate @ 1%, sodium chloride @ 6%, copper sulphate @ 0.2%, Copper Hydroxide @ 0.3%, Glyphosate 41% SL @ 0.1% and Butter milk @ 10%

Introduction

Mango (*Mangifera indica* L.) is an important fruit crop of the tropical and subtropical countries. It is an important fruit crop grown on most of the regions in India. However the Mango crop is suffering from various types epiphytes. Epiphytes are plants that grow on other plants and are often known as air plants. They are mostly found in moist tropical areas on canopy tree-tops, where they exploit the nutrients available from leaf and other organic debris (Ari Satia *et al*, 2020) [1]. These epiphytes were found predominantly in mango plantation of Konkan region. So the efforts has been made to study the efficacy of some locally available economical material to select the effective control measure to control the epiphytes of mango.

Materials and Methods

A Field experiment was conducted on Mango for three years started from 2019-20 to 2021-22 at the Regional Fruit Research Station, Vengurla, Dist. Sindhudurg. The survey was conducted in Konkan region of Maharashtra. Three different types of epiphytes were collected and get identified from authentic government institute. The observations on host range of these epiphytes were also recorded. The management study was conducted with following treatments by application/spraying. For this purpose the epiphytes covered branches were selected and marked with nylon string. The treated leaf lets were first counted and then sprayed/applied with respective treatment. The treatment of Paraquat dichloride 24% SL. was applied by colour roller. Two spraying/application were undertaken as there was continuous rain during season. The live leaflets were counted and percent death of the leaflets was calculated by using following formula.

$$\text{Percent inhibition} = \frac{\text{Number of leaflets inhibited}}{\text{Total no. of leaflets treated}} \times 100$$

The experiment was laid in Randomized Block Design (RBD) with three replications and twelve treatments.

Results and Discussion

Three major epiphytes on mango were identified as *Drynaria quercifolia*, *Aerides maculosum* and *Pyrrhosia lanceolata*. These three epiphytes were found predominantly in mango plantation of Konkan region. First two are common in the region, however *Pyrrhosia lanceolata* was recently introduced and spreading fast in mango plantation.

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The field experiments on its management were conducted for three consecutive seasons and pooled results are presented in Table 1. Significant death of leaflets was observed in the

treatments of Mechanical removal and Paraquat dichloride 24% SL @ 0.15% with 100 and 98.56% inhibition, respectively.

Table 1: Efficacy of different treatments on epiphytes management. (Pooled)

Tr. No.	Fungicides	Conc. (%)	Percent inhibition			Pooled Mean
			2019-20	2020-21	2021-22	
T ₁	Sodium chloride (NaCl)	4.0	60.48 (51.05)	67.62 (55.32)	64.63 (53.51)	64.24 (53.29)
T ₂	Sodium chloride (NaCl)	6.0	70.39 (57.03)	88.02 (69.75)	90.28 (71.83)	82.90 (66.20)
T ₃	Copper sulphate (CuSO ₄)	0.1	56.40 (48.68)	55.14 (47.95)	51.26 (45.72)	54.27 (47.45)
T ₄	Copper sulphate (CuSO ₄)	0.2	56.57 (48.78)	56.15 (48.53)	51.42 (45.81)	54.71 (47.71)
T ₅	Copper sulphate (CuSO ₄)	0.3	55.55 (48.19)	61.60 (51.71)	60.33 (50.96)	59.16 (50.29)
T ₆	Copper sulphate (CuSO ₄)	1.0	90.77 (72.31)	86.24 (68.23)	89.46 (71.06)	88.82 (70.53)
T ₇	Copper Hydroxide (CuOH)	0.3	3.09 (10.12)	4.62 (12.41)	3.93 (11.43)	3.88 (11.32)
T ₈	Glyphosate 41% S.L.	0.1	3.39 (10.61)	11.11 (19.47)	11.87 (20.15)	8.79 (16.74)
T ₉	Paraquat dichloride 24% SL	0.15	97.63 (81.14)	98.97 (84.18)	99.08 (84.50)	98.56 (83.27)
T ₁₀	Butter milk	10.0	3.02 (10.01)	5.37 (13.40)	2.95 (9.89)	3.78 (11.10)
T ₁₁	Mechanical removal		100.00 (90.00)	100.00 (90.00)	100 (90.00)	100 (90.00)
T ₁₂	Control (untreated)		0.00 (0.00)	2.37 (8.86)	1.48 (6.99)	1.28 (5.28)
S.E. +			2.38	1.76	1.93	1.73
C.D.@ 5%			6.79	5.18	5.67	5.09

* Figures in parentheses indicated Arc sin transformation

These two treatments were significantly superior over rest of the treatments in controlling *Pyrrosia lanceolata* epiphyte on mango. These were followed by the treatments of Copper sulphate @ 1% and Sodium Chloride @ 6% with 88.82% and 82.90% inhibition respectively. The results of present investigation are in close conformity with the results obtained by Edyson *et al*, 2022^[2] who reported that the epiphytes can be controlled by chemicals such as Metsulfuron herbicide in 100 ml of water. The Tej Pratap *et al*, 2021^[4] reported that the herbicide Paraquat with different concentration can control the broad spectrum weeds. The results are also in close conformity with the results obtained by Kofi and Kwasi 2004 who reported that Sodium chloride with 6% concentrations can controlled the epiphytes in Cocoa. The treatments of Sodium chloride @ 4%, Copper sulphate @ 0.1%, Copper sulphate @ 0.2%, Copper sulphate @ 0.3% were moderately effective in inhibiting the leaflets of epiphytes. All other treatments *viz.*, Copper Hydroxide @ 0.3%, Glyphosate 41% SL. @ 0.1% and Butter milk @ 10% were found ineffective.

Conclusion

It is thus concluded that the treatments of manually removing as well as spraying with Paraquat dichloride 24% SL @ 0.15%, Copper sulphate @ 1% and Sodium Chloride @ 6% were most effective in controlling *Pyrrosia lanceolata* epiphyte of mango. The cost of material/chemicals required to treat one square meter area is negligible i. e. less than rupees one in almost all the treatments except the treatment of Copper Hydroxide. The total cost of most of the effective

treatments was very less and varies between Rs.19.00 to Rs. 20.00. For cost-effective management of *Pyrrosia lanceolata* epiphyte manually removing OR spraying/applying once or twice of Paraquat dichloride 24% SL @ 0.15% OR Copper sulphate @ 1% OR Sodium Chloride @ 6% is recommended.

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