Research Paper

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Adoption of Plant Protection Measures for Control Of Mango Pests and Diseases

Agriculture

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ABSTRACT

In the present study it is revealed that majority of the mango growers were not adopting recommended plant protection measures for control of mango pest like mango hoppers, thrips, fruit flies, stem borer, shoot borer, mealy bug and termites. In case of control of disease like powdery mildew, majority of the mango growers had complete adoption whereas, majority of the mango growers had partial adoption regarding control measures of anthracnose. The study indicated that majority of the mango growers were not adopting recommended control measures for control of diseases like die-back and fruit rot. The study inferred that majority (66.67 per cent) of the mango growers had 'medium' level of adoption regarding plant protection measures.

INTRODUCTION

Mango (*Mangifera indica* L.) belonging to family Anacardiaceae is the world's leading fruit crop and it is the second most important commercially grown fruit crop of the country after banana. Total mango production in India is 18.00 million tonnes with 22.1 per cent share in total fruit production. In India mango is grown on 2.5 million ha which contributes 35.8 per cent share in total area under fruit crops. Irrespective to the reality that India is having a comparative advantage over other mango producing countries in terms of total production still the productivity (7.2 tonnes/ha) continues to be low. As mango is susceptible to incidence of different pests and diseases, their occurrence is the important factor influencing its production and productivity. The loss of yield in mango is due to occurrence of different pest and diseases and inability to control the same by the growers due to lack of knowledge. Generally, it is observed that mango growers do not adopt plant protection measures on large scale, which is one of the main constraint in increasing the average yield per hectare. Taking into consideration all these facts, it is necessary that mango growers should have adoption of plant protection measures to keep their mango crop free from pest and disease infestations so that they can increase production and productivity of mango. Keeping all the above facts in mind, present investigation was carried out with the objective; to study the adoption of plant protection measures followed by the mango growers.

METHODOLOGY

The present study was under taken in Kolhapur district of western Maharashtra region which is adjacent to the leading region in mango production i.e. South Konkan. Two tehsils from Kolhapur district with highest area under mango crop were selected for the research study *viz;* Chandgad and Gadhinglaj.

Information regarding the progressive mango growers was obtained from the Taluka Agriculture Officer and then 105 respondents from two tehsils were selected purposively considering the conveyance and objectives of the study. The data from mango growers were collected through personal interview schedule.

RESULTS AND DISCUSSION

Adoption of plant protection measures followed by the mango growers

Information regarding to the adoption of the mango growers regarding plant protection measures is given in Table 1.

Table 1: Distribution of the mango growers according to adoption of plant protection measures

Sr. No	Level of Adoption (Score)	Respondents n=105	
		Number	Percent
1	Low (Up to 3)	23	21.90
2	Medium (4-12)	70	66.67
3	High (13 and above)	12	11.43
	Total	105	100

It is observed from Table 1 that majority (66.67 per cent) of the mango growers had 'medium' level of adoption regarding plant protection measures,while 21.90 per cent and 11.43 per cent of them had 'low' and 'high' level of adoption respectively. Distribution of the respondents according to extent of adoption of plant protection measures is similar with the findings of Godse (2010).

Adoption of mango growers regarding plant protection measures for control of mango pests

Information pertaining to the adoption of the mango growers regarding plant protection measures for control of pest is presented in Table 2.

Table 2: Adoption of mango growers regarding plant protection measures for control of mango pests

Sr. No.	Recommended Plant Protection Measures for Control of Pests	Adpotion		
		Complete	Partial	No
		Number (Percent)	Number (Percent)	Number (Percent)
1	Mango Hoppers			
A	Spraying Schedule			
I	First spray: At end of September or first week of October			
	Cypermethrin 25 EC (3ml) or Fenvalerate 20 EC (5 ml) or Decamethrin 2.8 EC (9 ml) mixed in 10 litres of water	4 (3.81)	18 (17.14)	83 (79.05)
II	Second spray: After bud burst stage			
	Quinalphos 25 EC (20 ml) in 10 litres of water	2 (1.90)	11 (10.48)	92 (87.62)

III	Third spray: Two weeks after second spray (at the flowering stage)			
	Imidacloprid 17.8 EC (3 ml) or Chlothianidin 50 WDG (1.2 g) mixed in 10 litres of water	5 (4.76)	12 (11.43)	88 (83.81)
IV	Fourth spray: Two weeks after third spray			
	Thiamethoxam 25 WG (1 g) mixed in 10 litres of water	0 (0)	0 (0)	105 (100.00)
V	Fifth spray: Two weeks after fourth spray			
	Phenthoate 50 EC (20 ml) or Dimethoate 30EC (10 ml) mixed in 10 litres of water	2 (1.90)	6 (5.71)	97 (92.39)
VI	Sixth spray: Two weeks after fifth spray			
	Any insecticide suggested in fifth spray which is not used	0 (0)	0 (0)	105 (100.00)
2	Thrips			
A	Spray of Spinosad 45 EC (2.5 ml) in 10 litres of water	0 (0)	2 (1.90)	103 (98.10)
B	Spray of Thiamethoxam 25 WG (2 g) in 10 litres of water if infestation of pest found to be sever	0 (0)	0 (0)	105 (100.00)
3	Fruit Fly			
A	Use of *Rakshak* Traps (4/ ha). Keep the traps hanging on the tree above 1-3m from ground and use of Methyl eugenol (3 ml/ trap) as fly attractant	0 (0)	0 (0)	105 (100.00)
4	Stem Borer			
A	Removal of grubs with iron hook	5 (4.76)	12 (11.43)	88 (83.81)
B	Injection of EDCT mixture or one Alluminium Phosphide (ALP) tablet in hole and seal the hole with mud	0 (0)	0 (0)	105 (100.00)
5	**Shoot Borer**			
A	Spray of Quinalphos 25 EC (20 ml) in 10 litres of water	2 (1.90)	11 (10.48)	92 (87.62)
6	Mealy Bug			
A	Mixing 100g of 2% methyl parathion dust per tree in soil	2 (1.90)	9 (8.57)	94 (89.53)
B	Spray of Chloropyrifos 20 EC (20 ml) or Profenofos 50 EC (20 ml) and addition of 10 ml sticker or 25 g fish oil rosin soap in 10 litres of water	0 (0)	0 (0)	105 (100.00)
C	To prevent the nymph from climbing on trees, banding the tree trunks with 30 cm wide alkathene sheet (400 gauge) on 30 cm distance from ground level	0 (0)	3 (2.86)	102 (97.14)
7	Termites			
A	Complete destruction of termitarium and destruction of the queen	85 (80.95)	20 (19.05)	0 (0)
B	Spray of Chlorpyrifos 20 EC (5 ml) or Methyl parathion 50 EC (2 ml) per litre of water	3 (2.86)	13 (12.38)	89 (84.76)

The data given in Table 2 indicated that, in case of control of mango hoppers, majority (79.05 per cent) of the mango growers had 'no' adoption regarding the first spray of 3 ml cypermethrin 25 EC or 5 ml fenvalerate 20 EC or 9 ml decamethrin 2.8 EC in 10 litres of water at the end of September or first week of October. In case of the second spray for control of mango hoppers, after bud burst stage with 20 ml quinalphos 25 EC in 10 litres of water, majority (87.62 per cent) of the mango growers had 'no' adoption. With respect to the third spray i.e. two weeks after second spray with 3 ml imidacloprid 17.8EC or 1.2 g chlothianidin 50 WDG in 10 ml of water majority (83.81 per cent) of the mango growers had 'no' adoption. The fourth spray for control of mango hoppers which is scheduled two weeks after third spray i.e. spray of thiomethoxam 25 WG at the rate of 1g per 10 litres of water was not at all adopted by the mango growers. In case of the fifth spray, two weeks after fourth spray with 20 ml phenthoate 50 EC or 10 ml dimethoate 30 EC in 10 litres of water, 92.39 per cent of the mango growers had 'no' adoption, whereas with regard to sixth spray, not even single mango grower adopted the practice of sixth spray.

In case of recommendation for control of thrips i.e. spraying 2.5 ml spinosad 45 EC in 10 litres of water, Table 2 depicted that majority (98.10 per cent) of the mango growers had 'no' adoption. The second spray which is recommended for sever infestation of thrips i.e. spray of 2 g thiamethoxam 25 WG in 10 litres of water was not adopted by any of the mango grower.

For control fruit fly, which is one if the major pest of mango, recommended practice of installation of *Rakshak* trap (pheromone trap) at the rate of 4 traps per ha and use of methyl eugenol (3 ml/ trap) as fly attractant was not at all adopted by the mango growers

It is inferred that majority (83.81per cent) of the mango growers had 'no' adoption about mechanical method for control of stem borer i.e. removal of grubs from tree trunk with help of iron hook. In case of chemical control i.e. injection of EDCT mixture or one aluminium phosphide (ALP) tablet in hole and sealing the hole with mud was not at all adopted by any mango grower.

With respect to control of shoot borer with spray of 20 ml quinalphos 25 EC in 10 litres of water, majority (87.62 per cent) of the mango growers were not adopting recommended control measure.

With respect to the recommended practice of mixing 100g of 2 per cent methyl parathion dust in soil under the tree it is indicated that 89.53 per cent of the mango had 'no' adoption. In case of spraying 20 ml chlorpyrifos 20 EC or 20 ml profenofos 50 EC and addition of sticker or 25 g fish oil rosin soap in 10 litres of water, it is revealed that the practice was not at all adopted by the mango growers. Regarding the physical control i.e. banding the tree trunks with 30 cm wide and 400 gauge plastic sheet to prevent the nymphs from climbing on tree, most of (97.14 per cent) the mango growers had 'no' adoption of this practice.

Regarding control of termites i.e. complete destruction of whole termitarium as well as queen, most of the (80.95 per cent) mango growers had 'complete' adoption. Majority (84.76 per cent) of the mango growers had 'no' adoption regarding the recommendation of spraying 5 ml chlorpyrifos 20 EC or 2 ml methyl parathion 50 EC per litre of water against termites.

Adoption of the mango growers regarding plant protection measures for control of diseases

It is observed from Table 3 that in case of recommended control measures for die- back i.e. spraying 30 g copper oxychloride 50WP or 30 g mancozeb 80 WP in 10 litres of water or spraying 1% Bordeaux mixture, majority 71.43 per cent of the mango growers had 'no' adoption. Majority (93.33 per cent) of the mango growers had 'no' adoption.regarding cutting and burning of

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infected branches and applying Bordeaux paste on cut portion.

Table 3: Adoption of mango growers regarding plant protection measures for control of mango diseases

Sr. No.	Recommended Plant Protection Measures for Control of Diseases	Adoption		
		Complete	Partial	No
		Number (Percent)	Number (Percent)	Number (Percent)
1	Die-back			
A	Spray of Copper Oxychloride 50WP (30 g) or Mancozeb 80 WP(30 g) in 10 litres of water or Spray of 1% Bordeaux mixture	12 (11.43)	18 (17.14)	75 (71.43)
B	Cutting and burning of infected branches and application of Bordeaux paste on cut portion	2 (1.91)	5 (4.76)	98 (93.33)
2	Anthracnose (On Leaves/ Inflorescence/ Fruits)			
A	Spray of Carbendazim 50 WP (10 g) or Copper Oxychloride 50 WP (25 g) in 10 litres of water or Spray of 1% Bordeaux mixture on leaves, inflorescence and fruits	17 (16.19)	43 (46.67)	39 (37.14)
3	Powdery Mildew (On Leaves/ Inflorescence)			
A	Spray of Sulphur 80 WP (20 g) or Carbendazim 50 WP (10 g) or Hexaconazole 5 EC (5 g) or Thiophanate methyl 70 WP (10 g) or Propineb 70 WP (20 g) in 10 litres of water	42 (40.00)	23 (21.90)	40 (38.10)
4	Fruit Rot			
A	After harvesting dipping of fruits in 0.05% solution of Carbendazim for 10 mins	6 (5.72)	27 (25.71)	72 (68.57)

Anthracnose is the one of the major disease of the mango which infects the different plant parts like leaves, inflorescence and fruits also. Table 3 indicated that with respect to the control measure of this disease i.e. spraying 10 g carbendazim 50 WP or 25 g copper oxychloride 50 WP in 10 litres of water on leaves, inflorescence and fruits, majority (46.67 per cent) of the mango growers had 'partial' adoption about it.

Powdery Mildew is the most sever diseases of mango which causes more losses in the mango. In case of recommended control measures for the control of powdery mildew disease i.e. spraying 20 g sulphur 80 WP or 10 g carbendazim 50 WP or 5 ml hexaconazole 5 EC or 10 g thiophanate methyl 70 WP or 20 g propineb 70 WP in 10 litres of water, majority (40.00 per cent) of the mango growers had 'complete 'adoption.

In case of post harvest control measures for control of fruit rot i.e. dipping mango fruits in 0.05 per cent solution of carbendazim 50 WP for 10 minutes, majority (68.57 per cent) of the mango growers had 'no' adoption.

CONCLUSION

The findings of the study indicated that as mango growers had medium level of adoption regarding recommended plant protection measures. It is necessary to impart proper scientific and technical knowlwdge regarding recommended plant protection measures of mango through trainings and demonstrations to increase their level of adoption.

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