CONSTRAINTS IN ADOPTION OF INTEGRATED PEST MANAGEMENT STRATEGIES AGAINST MANGO MEALY BUG *DROSICHA MANGIFERAE* (GREEN) IN TALUKA HYDERABAD (RURAL)

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ABSTRACT: *The present research study was conducted to determine constraint in adoption of integrated pest management strategies against mango mealy bug Drosicha mangiferae (Green) in taluka Hyderabad (rural) during 2014-2015. Six union council of taluka Hydarabad (rural) were randomly selected for study purpose. Twenty samples from each union council (a total sample size of 120 respondents) were interrogated. The result indicated that mango growers of all (six) union councils of Taluka Hyderabad adopting (93.78%) insecticide against mango mealy which is very high amount of poisonous material and creating environmental pollution, where as biological control (1.21%), Mechanical control (2.88%), cultural control (26.65%), Physical control (9.39%), and bio-pesticide (2.9%), respectively. Study further revealed that illiteracy or low education level (65.23% Lack of adequate extension problem (72.87%), Time consuming practice problem (78.87%), Lack of awareness (93.37%), Lack of interest or orchard owner (68.25%), Age Problem (63.37%), Money problem (64.27), and Tenant system (66.71%) respectively, was observed in mango growers of six union councils of Taluka Hyderabad.*

Key words: *Drosicha mangiferae*, IPM strategies, mango growers.

INTRODUCTION

Mango, *Mangifera indica* (L) belongs to family Anacardiaceae. It is one of the widely cultivated tropical fruit of the world which originated from India [1]. Currently, mango is holds a key positions in the tropical fruits of the globe [2]. In Pakistan, mango is the second largest cultivated and productive fruit after citrus [3]. Owing to lush green vegetative parts of mango and tender fruits, a number of insect pests attack mango, that not only reduce its yield quantitatively but also qualitatively. Causes of the low mango production include poor management strategies and lack of integrated pest management strategies against noxious pests of mango. Among mango insect pests, mango mealy bugs, *Drosicha mangiferae* is one of the key pests and serious threat to mango [4,5]. Bio-pesticides are the substances or mixture of substances used to prevent, destroy, repel, attract, sterilize or mitigate the pests [6]. The pest control in environmentally safe ways is considered an integral part of balanced agro-ecosystem management and protection [7]. However, in Pakistan most of the farmers still use toxic chemicals in crops and orchards to control pests [8]. Due to heavy uses of pesticide chemicals, people suffer from many diseases and they also pollute environment, soil, water and wild life [9]. Considering the adverse effects of pesticides and potential of IPM strategies to manage mango mealy bugs, this study was conducted to examine the factors effecting adoption of IPM strategies among mango growers of Taluka Hyderabad (Rural).

MATERIALS AND METHODS

This project was conducted in Taluka Hyderabad (Rural) which comprised of eleven union councils. Out
of eleven, six union councils were randomly selected and from each union council, twenty mango growers were randomly selected. Accordingly, the sample size of this study comprised of 120 respondents. The sample size of respondents was determined by suggested formula. The data were collected with the help of a pre-tested and validated interview schedule based on a descriptive method. A questionnaire was designed to get information regarding the reasons for not aopting IPM strategies against mango mealy bug despite of several years of infestation. Questionnaire also comprised of questions to get information regarding the mango growers in mango cultivation. A four-point likert-scale was used to analyze the obtained information from the respondents. Depending on the research requirements of the study, interview schedules were used as a research tool. Study was based on socio-economic characteristics with qualitative mode of variables. The data were collected in the form of complex qualitative information. The collected data was then coded and analyzed using statistical package for social sciences (SPSS, 20.0).

RESULT AND DISCUSSION

Results given in Table 1 indicated that mango growers of all (six) union councils of Taluka Hyderabad adopting (93.78%) insecticide against mango mealy which is very high amount of poisonous material, that chemicals creating environmental pollution findings agree with [8] who reported that in Pakistan most of the farmers use toxic chemical pesticides on many crops and orchard trees. Due to use of many pesticide chemicals, people suffer from many diseases and pollute the environment, soil, water and wild life [9]. Present findings indicated that the adoption of eco-friendly measures are very low i.e. mango grower of all (six) Union councils adopting biological control 1.21%, Mechanical control 2.88%, cultural control 26.65%, Physical control 9.39%, bio-pesticide 2.9%, respectively. Although different scientist have worked on all environmentally safe control measures against mango mealy bug, but [10] reported that the IPM management of mealy bug is very important and useful if timely operations are done. Among IPM strategies, cultural methods comprised of soil tillage using disks to bring the mealy bugs to the surface of soil to expose them to their natural enemies i.e., birds, raccoons, skunks etc. To get maximum advantage of tillage, ploughing should be done in

the month of November so that mealy bugs can also be exposed to sunlight. [11] studied the effect of various control measures (cultural, mechanical and chemical) combined in an IPM strategy for the management of mango mealy bugs. The maximum females were collected from the root area under tree canopy of $0.16m^{-2}$. It was also observed that combination of all three methods resulted in the reduction of pest population up to 98.46%. Moreover, cultural methods including ploughing, weeding and sanitation also reduced the population of mealy bugs considerably in the study orchards because cultural practices exposed the mealy bug eggs out of the soil to sunlight and natural enemies. Another study described that management of mealy bugs in mango orchards can be achieved through hoeing or plowing the soil up to the depth of 15 cm, at least three times between June and December, to destroy dia pausing eggs [12].

Table 2 indicated that illiteracy or low education level (65.23%) was observed in mango growers of six union councils of Taluka Hyderabad, where as Lack of extension services (72.87%), *Time consuming practice problem (78.87), Lack of awareness (93.37%), Lack of interest or orchard owner (68.25%), Age Problem (63.37%), Money problem (64.27), Tenant system (66.71%) respectively. Present findings revealed that majority of mango growers not fully aware about the Integrated pest management strategies against mango mealy bug, our results agree with [13] who specifies that lack of proper extension, non-awareness, tenant system, age problem, and all other socio economic factors are the key obstacles to the adoption of eco-friendly measures against mango mealy bug. [14] also stated that socioeconomic characteristics of growers such as age, educational level, marital status, land size, farming experience, play an important role in determining mango growers participation in orchards activities. The age of respondent's 42.10±8.55 years were observed. Similar results were obtained by [14] found that individuals of all age groups were involved in this activities. Due to tenant system mango growers not adopting IPM strategies, and avoid time consuming practice problem.

Table No 01. Union council wise Control measures taken by growers against Mango mealy bug in taluka Hyderabad.

S. No	Union council	Integrated pest management strategies					
		Insecticide Control (Organic compounds)	Biological Control	Mechanical Control	Cultural Control	Physical Control	Bio-pesticide (Inorganic compounds)
1.	Mosa Khatyan	95.36	1.3	5.01	20.36	11.80	3.3
2.	Tando Qaiser	97.49	2.5	3.1	21.76	13.1	5.0
3.	Tandojam	92.12	1.5	3.46	36.19	10.14	1.1
4.	Haji Sawan Khan Gopang	90.17	2.	2.13	28.74	9.1	2.5
5.	Masu Bhurgri	96.54	0	2.3	36.36	5.1	3.2
6.	Husri	91.03	0	1.3	16.52	7.1	2.3
	Mean	**93.78**	**1.21**	**2.88**	**26.65**	**9.39**	**2.9**

Table No. 02 Constraint in adoption of integrated pest management strategies against Mango Mealy bug.

S. No	Union council	IPM knowledge	Lack of extension services	*Time consuming practice problem	Lack of awareness	Lack of interest or orchard owner	**Age Problem	Money Problem	Tenant system
1.	Mosa Khatyan	75.07	85.23	89.47	92.14	76.64	52.19	59.47	69.28
2.	Tando Qaiser	58.03	77.83	82.16	90.32	25.46	66.96	41.26	46.89
3.	Tandojam	49.52	44.58	89.26	92.12	58.19	78.49	59.13	58.12
4.	Haji Sawan Khan Gopang	67.89	86.12	56.48	93.63	89.46	54.25	83.20	69.76
5.	Masu Bhurgri	66.76	74.36	79.12	95.55	85.12	49.36	68.23	80.14
6	Husri	74.14	69.10	76.66	96.46	76.25	78.99	74.36	76.11
	Mean	**65.23**	**72.87**	**78.85**	**93.37**	**68.25**	**63.37**	**64.27**	**66.71**

*Time consuming practices: biological control, mechanical control, bio-pesticide, etc.

** Age Problem: Mango grower respondents (teen age workers).

CONCLUSIONS

On the basis of findings it is concluded that (93.37%) mango growers of all (six) union councils of Taluka Hyderabad not fully aware about the IPM strategies against mango mealy bug, whereas (66.71%) mango growers hand over their orchards on tenant system, (65.23%) of the respondents growers were observed illiterate or low education level. It was also observed that Illiteracy and lack of awareness is the big problem seen in between mango growers.

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