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Study on level of awareness about fruit fly menace in farmers of south Gujarat

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Abstract
In Gujarat, fruits such as mango, sapota, banana and many other fleshy fruits are cultivated on large scale. Out of various factors responsible for low yields, the major cause appears to be the damage caused by the fruit fly. For increasing the yield of fruit crops, it is necessary to accelerate the level of adoption of plant protection measures. Awareness is one of the important component in the process of adoption. In order to understand the level of awareness about fruit fly menace in farmers of south Gujarat, that too on scientific ways, the present study was undertaken. During the studies it was found that, the majority of farmers (69 per cent) of study area had medium level of awareness about important insect pests of fruit crops, life cycle, activity period, and various management practices of fruit flies.

Keywords: fruit fly, awareness, south Gujarat, fruit crop

Introduction
Among horticultural crops, fruits are of immense importance because of their economic value and return. India is now second largest producer of mango, banana, sapota and acid lime. In Gujarat, area under fruit crops is 4, 19, 968 hectares with production of 89,53,109 tonnes [1]. In Gujarat, and particularly in south Gujarat, fruits such as mango, sapota, banana and many other fleshy fruits are cultivated on large scale. Now a day, a demand of fruits has been increased in many developed and developing countries in the form of canned or fresh fruits. Further per capita consumption of fruits is increased from 40 to 85 gm. This has created the demand for increasing yield as well as quality fruits. But, the insect pest problem has affecting both quality and quantity of fruits. There are over 1000 species of insect found damaging fruit trees all over the world, of these as many as 800 have been reported from India [2].

Among various species of insect pest attacking the fruits, 'Tephritidae' are one of the most fascinating and diversified group of insect. These are commonly called as "fruit fly" or "orchard fly" due to their close association with fruits. Fruit flies pose a major threat to local as well as global trade. Since many countries have invoked quarantine restriction to minimize the risk of establishment of exotic species. Therefore, successful cultivation and export are highly depend on sound pest management system.

It is well known fact that even after the spectacular achievement in the field of horticulture, the rate of production per unit area is still low. It is not because of the lack of improved plant protection technology, but there exist a wide gap between the research findings available for the farmers and their actual acceptance and adoption in the farming system. Similar line of work has not been done on this aspect. However, work on knowledge adoption and constraint in various crop production, protections were evaluated earlier by few workers on other crops [3-7]. On this ground it is imperative to examine the awareness of farmers of south Gujarat regarding fruit fly, a notorious insect pest of various fruit crops of south Gujarat.

Methodology
The present investigation was carried out in Navsari, Surat and Valsad district of south Gujarat. Keeping in view the various aspects of studies an exclusive interview schedule was prepared to collect required information, which may help to prepare a detail preview of this study. A necessary help was sought from Department of Extension Education, Navsari Agricultural University, Navsari.

The method used in the data collection was a field survey. The data were collected by personal interview with 120 respondents from 12 talukas. The purpose and objectives of the survey were well explained to the respondents before the actual interview. Thereafter, the information

was collected and responses were recorded in the interview schedule. All the responses recorded in the interview schedules were transformed to the master table and frequencies were find out. The data were organize and tabulated in such a way that may give proper, representation.

For the measurement of fruit fly awareness among farming community, a schedule was specially constructed which contained 21 questions/ statements under different heading based on experience gained. These questions were asked to the respondents whether they were aware or not. To measure the awareness of respondent a scaling technique of Mayani and Kumar (1980) was used with some modification [8]. For correct answer, one score and for wrong, zero score was given. Thus the total probable scores regarding awareness about fruit fly were obtained for each respondent. Later on mean and standard deviation was calculated and respondent were grouped in to the following three categories.

Level of awareness		**Score limit**
1. Low	:	Below mean – standard deviation.
2. Medium	:	In between high and low level
3. High	:	Above mean + standard deviation.

The frequency and per cent awareness were also calculated.

Results and Discussion

A perusal of data in table (1) revealed that an overwhelming majority of the respondents (70 per cent) said that fruit fly is a major pest of fruit crops followed by mango hopper (10 per cent), bud borer (10 per cent), shoot borer (5 per cent) and mealy bug (4 per cent). Thus, it can be concluded that farmers of study area have awareness about threat of fruit fly. This might be due to suffering from heavy economic losses, spoiling prestige in local as well as international market and affecting quality of fruits.

Table 1: Farmers awareness about fruit fly in south Gujarat

Sr. No		Question/ Statement	Per cent awareness
1		Which are the five important insect pest of fruit crops grown in south Gujarat	
	i	Mango hopper	10
	ii	Bud borer	10
	iii	Mealybug	5
	iv	Shoot borer	5
	v	Fruit fly	70
2		**Life cycle of fruit fly**	
	i	Female laid eggs on fruit	53
	ii	Maggot feed on pulp	100
	iii	Maggot pupate in soil	81
	iv	Three species of fruit flies found in south Gujarat (*Bactrocera dorsalis, B. zonata and B. correcta*)	12
	v	Adult fly resembles to house fly	77
	vi	Fruit fly travel up to 2-3 Km. distance	12
	vii	In mango activity of fruit fly observed from May-July	59
	viii	In sapota activity of fruit fly observed from April- August.	56
3		**Management**	
	A	Cultural practices	
	i	Ploughing/raking the area under and between trees during summer and early harvest of mature fruits	75
	ii	Sanitation (Collection and destruction of fallen, infested fruits)	81
	B	Trap crop	
		Plantation of tulsi on boarder of orchard	38
	C	Post harvest management	
	i	Hot water management (HWT), Vapour heat treatment (VHT)	14
	ii	Fumigation with methyl bromide or fumigants	8
	D	Chemical control	
	i	Cover spray of insecticide	80
	ii	Bait spray	6
	iii	Tapping of adults by means of chemical attractant	78
	iv	Wide area control is more effective than individual	100
	E	Fruit fly traps	
	i	Conventional trap(methyl eugenol plus dichlorovas)	28
	ii	Modified (Patel) fruit fly trap (only methyl eugenol)	11
	iii	Plywood block trap(methyl eugenol+ ethanol+ dichlorovas)	60

Studies on life cycle of fruit flies indicated that all the respondents (100 per cent) are well aware about feeding of maggot inside the fruits. This result might be due to critically observing fruit during consumptions, whereas over half of the respondents (59 and 56 per cent) had knowledge about major activity of fruit fly in mango and sapota. Further, it was found that, the 53 per cent of respondents were awared about egg laying by female on fruits. Moreover, more than one third respondents (81 per cent) are awared that maggot pupate in soil and fly resemblance to house fly (77 per cent). A meagre percentage of respondents (12 per cent) had knowledge about three species (*B. dorsalis, B. zonata and B. correcta*) of fruit flies found in south Gujarat and distance traveled by fruit fly (12 per cent). In other ward 88 per cent of respondents were unaware about same. Due to minute in size, not easily visible and lack of technical knowledge might be plausible reasons behind less awareness about resemblance to house fly, three species and distance travelled by flies.

Further the data indicated that the majority of the respondents had awareness about cultural control practices. It was found that 81 per cent of respondents well aware of sanitation *i.e.* collection of fallen and infested fruits and destruction in pit, followed by ploughing/raking of soil (75 per cent).

With regard to trap crop with special reference to plantation of tulsi (*Ocimum sanctum*) on border of orchard was known by 38 per cent of growers. It is quite obvious that the plantation of tulsi as a trap crop for attracting male fruit flies is the innovative technology for fruit growers and lack of scientific knowledge might be responsible for lesser awareness about its use.

As regard to post harvest management practices like, Hot Water Treatment (HWT), Vapour Heat Treatment (VHT) and fumigation negligible (less than 14 per cent) were aware about its use. Lack of scientific knowledge might be plausible reason behind less awareness of post-harvest management practices.

Table further portrays that, the 80 per cent of respondents were aware about use of insecticides for the control of adult fruit flies whereas, more than 78 per cent of respondents were found to be aware about use of chemical attractant in trapping the male flies. Further, the cent per cent of farmers (100 per cent) were agreed that the farmers of concerned area together by adopting community management practices could effectively check the fruit fly infestation.

This finding indicated that the farmers of study area are well aware and conscious about fruit fly management, moreover it was dishearting to note that a meagre per cent (6 per cent) of respondent had awareness about bait spray against fruit fly. Lack of knowledge about its use, ingredient, their ratio, application rate and technique of bait preparation might be responsible for not adopting bait application practices.

A study on knowledge of fruit fly trap indicated that the more than half of the respondents (61 per cent) were well aware about plywood block trap followed by conventional (28 per cent) and modified fruit fly trap (11 per cent).

Table 2: Awareness level of respondents about fruit fly (N=120)

Sr. No	Level of aware ness	Frequency	Per cent awareness
1	Low (Score upto 9.11)	23	19
2	Medium (Score between 9.12 to13.44)	83	69
3	High (Score more than 13.45)	14	12

The overall awareness presented in table (2) indicated that the majority of the farmers (69 per cent) had medium level of awareness about fruit fly followed by low (19 per cent) and high level of awareness (12 per cent).

Conclusion

The present study reveals that farmers of study area are well aware about fruit fly menace and there is scope for the improving knowledge of farmers regarding fruit fly by supplying scientific information up to farmers level.

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