

Studies on Seasonal Activity and Control of Fruit Flies (*Dacus* spp.) on Mango (*Mangifera indica* L.) at Faisalabad, Pakistan

Anjum Suhail¹, M.Razaq² and M. Shahid Yazadni¹

(1) Department of Agriculture Entomology, University, of Agriculture, Faisalabad 38040, Pakistan;

(2) University College of Agriculture, B. Z., University, Multan 60800, Pakistan.

Abstract

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Studies were conducted to investigate efficacy of insecticidal application and pheromone traps against fruit flies on mango. Experiments were laid out in the orchards of University of Agriculture, Faisalabad, Pakistan. Orchards were treated with Diptrex 80 SP (trichlorophon) from May to August, (1997), once a month, along with 2, 4, and 6 pheromone traps/ha. It was found that 4 pheromone traps were best for controlling fruit flies with minimum damage of 1.5% and 4.15% in July and August respectively. The investigations on seasonal activity showed that population of *Dacus zonatus* (Saunders) was higher than *Dacus dorsalis* (Hendel) through out the activity season 1997. Maximum population of males of *Dacus* spp. was observed in first week of July. Fourteen days interval application was found to be more effective than monthly applications.

Key words: Insecticides, pheromone traps, chemical control, fruit flies, mango.

Introduction

Fruit flies *Dacus zonatus* (Saunders) and *Dacus dorsalis* (Hendel) are the serious pests of mango in Pakistan, *D.zonatus* also attacks citrus, guava, papaya and many vegetables (4). These flies cause great havoc to the above mentioned crops and render their fruits unfit for human consumption. Application of the insecticides to control fruit flies is a general trend. Due to the confined habit of feeding of maggots it is difficult to control them with insecticides. However, methyl eugenol is usually used for the control of the fruit flies but without any know how.

Present studies were, therefore designed to investigate the seasonal activity of fruit flies as well as comparing the efficacy of synthetic insecticides versus pheromone traps for the management of fruit flies population in the mango orchards.

Literature refers to the limited and scanty work on the field trapping of *Dacus* spp. with methyl eugenol either alone or in combination with insecticides. In that respect references should be made to the studies of Ibrahim *et al.* (5) in Malaysia, Qureshi *et al.* (8) on guava in Pakistan, Igha (6) on ogsawaplants, Anjum (3) and Mohyuddin and Mehmood (7) on guava *Psidium guajava* L. and mango in Pakistan. Studies related to the seasonal population fluctuations and field distribution were carried by Aluja, *et al.* (1, 2) on mixed plantation (*Papaya Carice papaya* L. mango, avocado etc) or alone in Mexico on tephritids other than *Dacus* spp.

Apparently, no previous investigations had been done on the density of the methyl eugenol traps or the seasonal activity of fruit flies in Pakistan.

Materials and Methods

Work was conducted in 1997 at experimental orchards of the department of Horticulture, University of Agriculture, Faisalabad. About 30 plants (in the area of approximately 0.5 ha. with plant to plant and row to row distance of 12m.) were included in each treatment at different locations. The experiment in each treatment was repeated thrice.

Pheromone traps

Methyl eugenol traps were installed in 3 experimental fruit orchards. The trap consisted of a plastic box measuring

13X22 cm fitted two open tubes for access (each measuring 2.5X5.5cm) on the opposite side of the box. It was hung to the branch 1-2m above the ground in such a way that leaves did not cover the opening of the trap. A cotton swab, moistened with methyl eugenol was put in each trap. Dead flies were removed and counted weekly.

To determine the effective number of traps for controlling fruit flies 2, 4, and 6 traps/ha were tested.

Insecticidal Application

Diptrex 80 SP (trichlorophon) was applied by orchards is using wheelbarrow sprayer with 250 lit.water/ha. Spraying was practiced at monthly intervals starting from May 1997 until August of the same year.

Data were collected through out the active season of the fruit flies from May to August, 1997.To determine the efficacy of various treatments, and the percentage infestation was recorded from 100 fruits picked randomly from each treatment with interval of a week.

Results and Discussion

The percentages of the infestation on mango fruits after different treatments are presented graphically in Fig.1. All the treatments proved effective. However, pheromone traps were better than Diptrex. Infestation was higher in August. Four traps proved more effective than either 2 or 6 traps /ha. Except the month of the August. Although no significant differences were observed between 4 and 6 traps/ha. Such results disagree With Igha (6) who mentioned that 8 traps /ha. Proved to be more effective. The high fruit damage may be attributed to coincidence with peak of fruit ripening season and occurrence of low temperature accompanied with high humidity.

Seasonal Activity

The population fluctuation of the males of two considered fruit flies (*D. zonatus* and *D.dorsalis*) as recorded weekly by pheromone traps is presented in Fig.2. Three peaks of *D. zonatus* (112,632 and 404) and *D.dorsalis* (192,204 and 190) were recorded during the first week of June, July and August, respectively. These results seem to agree with Mohyuddin and Mehmood (7) who recorded the

highest population peak in July in the same study province. Generally speaking the population of *D.zonatus* was relatively higher than that of *D.dorsalis* through out the whole activity season. These results are in agreement with those of Aluja *et al.* (1, 2) as they recorded different proportions of various tephritids in their studies at Mexico.

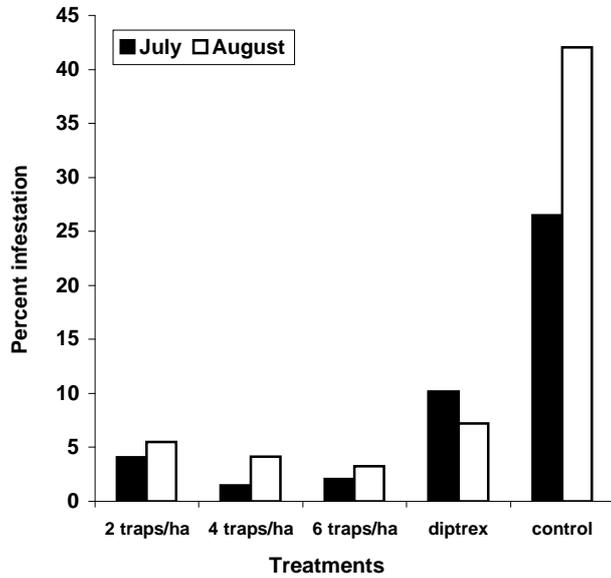


Figure 1. Percentages of infestations with fruit flies in mango orchards treated with pheromones traps and Diptrex throughout the activity season

Frequency of Application of Methyl Eugenol

The populations of *Dacus* spp. males captured in the traps treated with methyl eugenol fortnightly (trap 1) and

monthly (trap2) during the activity season of the 1997 are shown in Table 1.

In agreement with Mohyuddin and Mehmood (7) higher numbers of both species were attracted when the lure was applied at fortnight intervals. It is recommended therefore to add fresh lure every two weeks to get effective control.

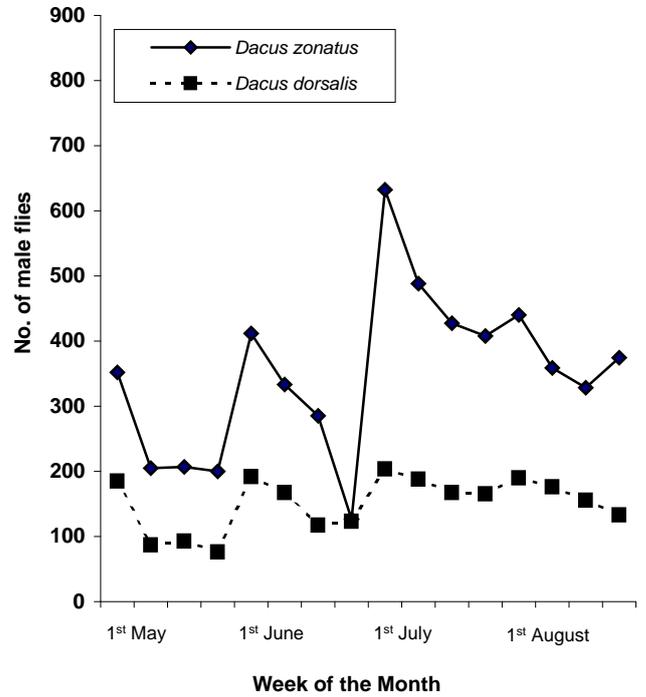


Figure 2. Numbers of male flies captured from different mango orchards during the activity season.

Table 1. Males of *Dacus* spp. captured in fortnightly (trap 1) and monthly (trap 2) during the activity season 1997.

Month	Trap 1 (Fortnightly)			Trap 2 (Monthly)		
	<i>Dacus zonatus</i>	<i>Dacus dorsalis</i>	Total	<i>Dacus zonatus</i>	<i>Dacus dorsalis</i>	Total
May	954	443	1397	751	202	953
June	1113	608	1721	983	462	1445
July	1933	714	2647	1528	503	2031
August	1501	639	2140	894	476	1370

المخلص

سهيل، أ.، م. رزاق وم. س. يازادني. 2000. دراسة النشاط الموسمي ومكافحة ذباب الفاكهة (*Dacus* spp.) على المانجو (*Mangifera indica* L.) في فيصل آباد، باكستان. مجلة وقاية النبات العربية. 18: 121-123.

نفذت دراسات لبحث فاعلية استخدام مبيدات الحشرات والمصائد الفرمونية في مكافحة ذباب الفاكهة على المانجو. وقد نفذت التجارب في بساتين كلية الزراعة، فيصل آباد، باكستان. وقد عوملت البساتين بمبيد Diptrex 80SP (ترايكوروفون) في الفترة من أيار/ مايو إلى آب/ أغسطس 1979 مرة كل شهر وتلازم ذلك مع وضع مصيدتين، أربعة وستة مصائد فرمونية/ هكتار. ووجد أن وضع أربعة مصائد كان الأفضل في مكافحة ذباب الفاكهة إذ لم يتجاوز الضرر 1.5% في تموز/ يوليو و 4.15% في آب/ أغسطس. وأظهرت الدراسات الخاصة بالنشاط الموسمي أن مجتمعات *Dacus zonatus* كانت أعلى من مثيلاتها في *D. dorsalis* خلال كامل موسم النشاط لعام 1997. وشهد الحد الأعظمي من مجتمع ذكور ذباب الفاكهة في الأسبوع الأول من تموز/ يوليو. ووجد أن الرش مرة كل أسبوعين كان أكثر فعالية من الرش مرة كل شهر.

كلمات مفتاحية: ذباب الفاكهة، مصائد فرمونية، مكافحة كيميائية، مانجو.

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