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POPULATION FLUCTUATION OF MALE ORIENTAL FRUIT FLY, *BACTROCERA DORSALIS* (HENDEL) IN A MANGO ORCHARD OF CHAPAINAWABGANJ

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ABSTRACT

Uddin MS, Reza MH, Hossain MM, Hossain MA, Islam MZ (2016) Population fluctuation of male oriental fruit fly, *Bactrocera dorsalis* (Hendel) in a mango orchard of Chapainawabganj. *Int. J. Expt. Agric.* 6(1), 1-3.

An experiment was conducted in a mango orchard of Regional Horticulture Research Station, Bangladesh Agricultural Research Institute, Chapainawabganj, Bangladesh during September, 2014 to August, 2015 to know the population fluctuation of male oriental fruit fly, *Bactrocera dorsalis* (Hendel). The highest (7236.30±18.69) fruit fly population was recorded in the month of July and the lowest (6.70±0.70) from January. From the experimental results, it was clearly observed that temperature, relative humidity, rainfall and host availability influenced the fruit fly population. Therefore, appropriate control measures should be taken at right time for getting the maximum out put.

Key words: *oriental fruit fly, population, mango orchard, Bactrocera dorsalis*

INTRODUCTION

Fruit flies (Diptera: Tephritidae) are important pests of fruits, vegetables and other ornamental plants (Bharathi *et al*. 2004; Drew and Romig, 2013). In general, the yield loss due to fruit flies varies between 30-100% depending on the fruit species and season (Dhillon *et al.* 2005). In Bangladesh, The oriental fruit fly, *Bactrocera dorsalis* (Hendel) is by far the most numerous species among all samples, with 57% of all collected flies and is a serious pest of a variety of fruits especially in mango (*Mangifera indica* L.), carambola (*Averrhoa carambola* L.) and guava (*Psidium guajava* L.) (Kabir *et al.* 1991; Leblanc *et al*. 2013). Considering the economic and quarantine importance control of this pest is frequently uttering most of the countries of the world (Heather and Hallman, 2008). It is very much difficult to manage the pest simply through the application of chemical pesticides due to their peculiar biological features. Again, it is also established that before developing insect pest management programme for a specific agro-ecosystem, it is necessary to have basic information on the incidence of the pest in relation to weather parameters which help in determining appropriate time of action and suitable method of control. Monitoring pest population round the year is one of the most important basic information in formulating IPM concept for sustainable agriculture. No published data is available so far regarding the population fluctuation of oriental fruit fly in the largest mango growing areas of Bangladesh. Hence, an experiment was made to study the population fluctuation of male oriental fruit fly in mango orchard of Regional Horticulture Research Station (RHRS), Bangladesh Agricultural Research Institute (BARI), Chapainawabganj.

MATERIALS AND METHODS

The experiment was conducted in a mango orchard of RHRS (24°35'33.6"N 88°16'46.6"E), BARI, Chapainawabganj, Bangladesh. Three traps baited with methyl eugenol were hung on the trees about 1.8 meters above the ground and maintained during September 2014 to August 2015. Traps were made of two litre empty plastic drinking water bottles, with two triangular lateral holes (approximately 25×30×30 mm) at mid height of the bottles. A lure plug with 2 g of lure (Scentry Biologicals, Billings, Montana, USA) and one half of a 25 × 90mm strip containing 10% dichlorvos (2,2–dichlorovynil dimethyl phosphate) (Vaportape® II, Hercon Environmental, Emingsville, Pennsylvania, USA) were suspended from the trap's ceiling with a hook made of tie wire. The dead flies were sorted out and counted at every 7 days interval. Monthly average temperature and relative humidity was collected from experimental record book of RHRS, Chapainawabganj. Collected data were analyzed by using Minitab and Microsoft Excel software. Monthly mean population of male oriental fruit flies was separated by Tukey's Test.

RESULTS AND DISCUSSION

The population fluctuation of male oriental fruit fly at different months of the year and trapped by using methyl eugenol baited traps has been presented in Table 1.

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Table 1. Monthly average trapped male oriental fruit fly, average temperature and relative humidity at Regional Horticulture Research Station, Chapainawabganj

Month	No. of trapped Fruit fly/trap (Mean±SE)	Temperature ^{0}C (Mean±SE)	Relative humidity (%) (Mean±SE)
September'14	795.30d±3.87	29.25±3.41	72.10±6.35
October'14	197.30f±3.94	28.70±2.95	69.83±5.68
November'14	35.70g±0.50	27.75±3.12	69.60±6.34
December'14	21.30g±0.50	26.87±2.75	67.75±5.79
January'15	6.70g±0.70	16.69±2.21	73.15±6.45
February'15	10.70g±1.04	21.98±2.25	64.95±7.31
March'15	56.70g±1.27	28.58±3.31	64.07±5.12
April'15	420.00e±5.30	33.62±2.35	57.93±5.96
May'15	1925.30b±10.20	35.68±2.39	69.61±8.61
June'15	4537.00b±15.23	31.66±2.98	86.63±7.31
July'15	7236.30a±18.69	29.95±3.12	76.18±7.89
August'15	1053.00b±17.32	30.05±2.89	75.13±6.45

Means followed by different letters differ significantly by Tukey's test

Monthly population fluctuation of male oriental fruit fly varies significantly ($p<0.001$). The highest fruit fly population was recorded in the month of July (7236.30±18.69) and the lowest was in January (6.70±0.70). The results revealed that population increase of oriental fruit fly starts from April onwards and the maximum population is recorded during May-August with a major peak in July (Table 1). The population declines slowly from October to November after which it is a few existent up to March.

From the Co-efficient of correlation (r) value it was clearly observed that fruit fly population mostly varies with temperature (r=0.36), relative humidity (r=0.64), rainfall and host availability. In the month of December-February a few fruit fly was captured in the trap. This is because of low temperature and relative humidity and no host available in the surroundings. On the onset of rainy season the fly population started to increase and during heavy rainfall population also higher. In the month of May, most of the gutti (non-grafted plant) varieties were matured and temperature and humidity favorable so the fly population was increased. In the month of June and July, most of the mangoes were matured and ready to harvest and the maximum number of fruit flies was trapped. After that a few Fazli and majority of the Ashwina mangoes were remained in the field so less number of trapped fruit flies. Shukla and Prasad (1985) observed that the emergence of fruit fly starts from April onwards and the maximum population is recorded during May-July which coincides with fruit maturity. The population declines slowly from August to September after that it is non-existent up to March which is more or less similar to our findings. Ye and Liu (2005) reported that the population of *B. dorsalis* started increasing in March and reached at peak in July at Kunming, China. In India, the peak population of oriental fruit fly in both the mango and guava orchard was found in July (Kapoor 1993; Gupta and Bhatia, 2000). The number of fruit flies captured with methyl eugenol baited traps correlated positively with temperature and relative humidity but in case of temperature the result is not statistically significant. Similar observation with regard to influence of meteorological parameters on the incidence of oriental fruit fly was also claimed earlier by several workers (Shukla and Prasad, 1985; Gupta and Bhatia, 2000).

CONCLUSION

From the experimental results it may be concluded that during high rainfall, high temperature and relative humidity periods (May-August) farmers and researchers should pay extra attention to formulate a sustainable management technique against the oriental fruit fly. To develop a sustainable management programme of fruit flies farmers may apply fruit bagging, field sanitation, protein bait spray, male annihilation technique, sterile male release, augmentation of biological control agents and insecticides in the mango orchard.

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