



THE POPULATION DENSITY OF POTATO (*SOLANUM TUBEROSUM*) PESTS IN TWO SEASON PLANTATION IN BAGHDAD, IRAQ

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Abstract

Potato is one of the most important food crops in the world and it is attack by many pests, therefore, the present study was carried out to find out the population density of pests in two plantation seasons (fall and spring) in Baghdad/Iraq. Black bean aphid (*Aphis fabae*), Egyptian cotton leafworm (*Spodoptera littoralis*), Whitefly (*Bemisia tabaci*), two-spotted mite (*Tetranychus urticae*), thrips (*Thrips tabaci*) and the natural enemy aphid lion (*Chrysoperla carnea*) were recorded in both season. Only, the population density of mite was very significantly higher in fall than spring, while aphid lion density was significantly higher in spring than fall season.

Introduction

Potato (*Solanum tuberosum*) is one of the most economical crops, which is useful as a source of energy and protein, it belongs to the Solanaceae family which contains 235 species (Smith, 1977). The potato was first domesticated in South America, particularly in Peru and Bolivia (Spooner *et al.*, 2005). Potato is grown in temperate, subtropical and tropical conditions over hundred countries (FAW, 2008). Now, the largest producer of potato is China with more than 22% of global production (Success Stories, 2018). The potato crop plays a significant role in the developing countries through its ability to provide nutritious food for the poor and hungry (Hussain, 2016). In the middle region of Iraq, potato is grown in two seasons, the first is spring plantation that start from December to mid-February and the second is fall plantation that start in late of August to mid of September (USAID, 2011).

Insect pests have been studied by entomologists for decades and only a portion cause problems for agricultural crops and humans (Rondon, 2012). Many pests are attack potato crop, including potato tuber moth (*Phthorimaea operculella*), aphids, *Thrips tabaci*, white fly (*Bemisia tabaci*), and Colorado potato beetle (*Leptinotarsa decemlineata*)

Due to the economic importance of potato and a few studies of the all its pests in Iraq, therefore, the purpose

of this study was to the abundance of potato (*Solanum tuberosum*) pests in Baghdad/Iraq

Materials and Methods

Study area

The study was conducted in the College of Agriculture/ University of Baghdad, Iraq field, which is 100 m² area. The Bureen variety of potato was planted in two seasons fall and spring with lines, the space between each line and other was 70 cm and the space between each plant and other was 25 cm.

Insect collection

In order to identify the pest species, insects were collected weekly. 45 leaf samples were chosen randomly and kept in plastic cases with all information (date and plant length), also collection net was used to cough the flying insects and took to the laboratory in order to count it and to send to the Natural History Research Center and Museum/University of Baghdad for the purpose of identification. Field experiment was carried out in randomized complete block design with three replications.

Results and Discussion

The data that presented in fig. 1 showed the fall season where many pests were identified; Black bean aphid (*Aphis fabae*) was found, the higher population density was 8 aphid/leaf was counted in 20 November 2017;

while the lower was 0 in 2 and 9 January 2018. The polyphagous insect *Spodoptera littoralis* was recorded also; the higher density was 5.1 pit/leaf in 25 December 2017; while the lower was 0 in 2 and 9 January 2018. White fly *Bemisia tabaci* was recorded with higher population density was 24 fly/leaf in 20 November 2017, while the lower was 0 in 2 and 9 January 2018. The two-spotted mite (*Tetranychus urticae*) was recorded with higher population density was 12.2 mite/leaf in 20 November 2017, while the lower was 0 mite/leaf in 2 and 9 January 2018. In addition, *Thrips tabaci* and the

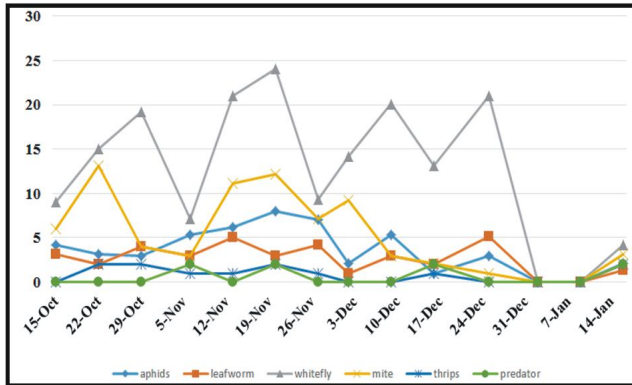


Fig. 1 : The population density of potato pests in fall season.

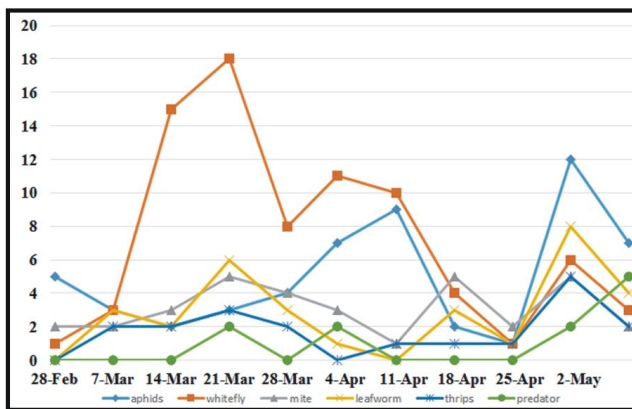


Fig. 2: The population density of potato pests in fall season. *L. sativae*.

natural enemy aphid lion (*Chrysoperla carnea*) were fluctuated from 0 to 2 through the study period. In conclusion, several pests were recognised and recorded with higher population densities were in November, while the lower population densities were in January.

The data that presented in fig. 2 showed the spring season. Same pests were identified in fall season, including black bean aphid (*Aphis fabae*), polyphagous insect *Spodoptera littoralis*, white fly *Bemisia tabaci*, the two-spotted mite (*Tetranychus urticae*), *Thrips tabaci*, and aphid lion (*Chrysoperla carnea*) The higher population density were 12, 8, 18, 5, 5 and 5 individual/

leaf respectively, while the lower population density were 1, 0, 1, 2, 0 and 0 individual / leaf respectively. In spring potato plantation in Iraq, six Potato varieties, including Barin, Revera, Divela, Rudlph, Alazata and Pleny were infested by both aphid and thrips on spring season (AL–Jorany *et al.*, 2016). In Pakistan, three potato cultivars, they found that Diamont variety was ideal for cultivation due to low aphid (*M. Persicae*) infestation as compared with Cardinal and Desiree variety of potato crop (Abbas *et al.*, 2015).

By comparing the population pest densities between fall and spring season plantation, no significant differences were observed in *Aphis fabae* ($P>0.19$), *Spodoptera littoralis* ($P>0.11$), *Bemisia tabaci* ($P>0.12$), and *Thrips tabaci* ($P>0.055$) population densities. However, the population density of *Tetranychus urticae* was very significant higher in fall than spring season ($P>0.002$) and the natural enemy *Chrysoperla carnea* density significantly higher in spring than fall ($P>0.04$).

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