POPULATION FLUCTUATIONS OF SOME MAIZE INSECT PESTS IN RELATION TO ECOSYSTEM COMPONENTS

By

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ABSTRACT

Heba Refaei Taha Mousa: Population Fluctuations of Some Maize Insect Pests in Relation to Ecosystem Components. Unpublished Ph.D. Thesis, Department of Plant Protection, Faculty of Agriculture, Ain Shams University, 2012.

Maize (*Zea mays* L.) is considered as a major cereal crop in Egypt. The present work was carried out to study the changes in the population density of maize insect pest and related natural enemies. During both 2008 and 2009 seasons, the period of *Sesamia cretica* larvae infestation divided into effective brood from mid March and early April until last week of May and ineffective brood from last week of May until first week of October, *Chilo agamemnon* infested maize plants from mid May and continued till late October and early November while *Ostrinia nubilalis* infested maize plants from mid August and continued till late October and early November. For 2008 season, *Rhopalosiphum maidis* individuals occurred on maize plants from last week of June until last week of October, Short period were recorded during 2009 season, from last week of July to first week of October.

For both 2008 and 2009 seasons, the highest number of *S. cretica* larvae was obtained on maize plants sown as early as March compared to April, June, May, July and August planting. For 2008 season, it seems that maize plants sown early on March were more liable to be attacked by *C. agamemnon* as compared to other planting dates. For 2009 season, results of statistical showed insignificant differences between means of larval contents. For 2008 season, the highest mean numbers of *O. nubilalis* found on maize sown on July compared to maize sown on June, August, March and April respectively. On the other hand, maize plants sown on May were completely free of *O. nubilalis* infestation. For 2009 season, the highest mean number of *O. nubilalis* found on maize sown on June compared to maize sown on July, August, May and March respectively while maize plants sown on April was free from *O. nubilalis* infestation. During 2008 season, the highest number of *R.*

maidis population was occurred for maize sown on June, followed by those sown on July, May, August and April while maize plants sown on March were free from *R. maidis* infestation while for 2009 season insignificant differences between the mean numbers of *R. maidis* individuals were recorded.

Maize plants were subject to heavy infestation by *S. cretica* larvae during vegetative stages while low infestation was recorded through maize reproductive stages through March, April, May, June, and July planting dates. *S. cretica* was secondary pest during August planting date. During the six planting dates from March until August, *C. agamemnon* infestation started in low numbers at late maize vegetative stages while main period of *C. agamemnon* infestation recorded during reproductive stages. Maize plating dates from March to May were from *O. nubilalis* infestation, while maize planting dates from July to August where subject to *O. nubilalis* infestation during maize reproductive stages. High level of *R. maidis* infestation were recorded during tasseling stage.

Initial infestation of *S. cretica*, *C. agamemnon, O. nubilalis* and *R. maidis* occurred when plant age was (23-59-64-52 days old respectively). Maximum infestation of *S. cretica*, *C. agamemnon, O. nubilalis* and *R. maidis* occurred when plant age was (49-80-74- 65 days old respectively).

Paederus alfierii was the most active predator in maize fields, the main period of *P. alfierii* activity existed from April till first half of July during 2008 season while for 2009 season, it existed between last week of May till forth week of July. For 2008 season, the main period of *Coccinella spp.* activity was from third week of March till the first week of June. For 2009 season, *Coccinella spp.* began its occurrence in maize plants at last week of April and continued till third week of August while *Chrysopa carnea* inhabited maize fields were from first week of April and continued until the last week of May.

For 2008 season Maize plants sown on June, March, May and April had the highest average kernel weight per plant, compared with maize plants sown during July and August. For 2009 season, Maize sown on

July and August harbored the lowest kernel weight per maize plant (as compared with that of April, March, May and June).

Keywords: Maize, *Sesamia cretica*, *Chilo agamemnon*, *Ostrinia nubilalis*, *Rhopalosiphum maidi*, Natural enemies, Population density, Planting dates, Initial infestation, Maximum infestation,Kernel weight.

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