Studies on potato tuber moth, phthorimaea operculella (zeller) (gelechidae: lepidoptera) and its control

Maha Sabry Mohamed El-Ghanam

Field experiment was conducted at Giza Governorate during two successive seasons 2002 and 2003 to study the population fluctuation of the Phthorimaea operculella. Also, to study the effect of certain weather factors (daily mean temperature, daily mean R.H.) and plant age on the three potato cultivars during two seasons. The obtained data showed that:•The potato tuber moth P. operculella started to occur from mid-February and the first of March and increased gradually reaching the peak in the second third of April and May or plant age (108 and 121 days from sawing) the high number of larvae were recorded (12.8; 12.3; 6.2 larvae/25 leaves and 12.9; 6.7; 6.1 larvae/25 leaves) during the first and second seasons on the potato tuber cultivars (Diamont, Karo and Sponta), respectively.•The weather factors (mean Temp. and plant age) had significant effect on population of P. operculella larvae with three cultivars Sponta, Kara and Diamont) also the relative humidity had negative significant effect on population of P. operculella during two successive seasons 2002 and 2003 on three cultivars, respectively.RS Summary• The percentage of variance explained by three tested factors during two seasons, was 62.1, 59.2 and 76.2% and (68.4, 63.4 and 81.5%) for the three potato cultivars, (Karo; Sponta and Diamont), respectively.Biological studyEffect of temperature and different cultivars on the biology of P. operculella:Some biological data of P. operculella were recorded at three constant temperatures of 30, 25 and 20°C and 70±5% RH and three cultivars Diamont, Karo and Sponta.The obtained results indicated the following:•The shortest incubation period (3.45 and 4.2 days) was found at 30°C on Diamont and Sponta varieties, the longest (7.6 and 8.9 days) at 20°C an Diamont and Sponta cultivars.•The highest hatching rate of eggs (81.92 and 61.32%) was obtained at 25°C on Diamont and Sponta varieties, while lower values (75.24; 56.75%) and (55.96; 49.27%) were found at 30°C and 20, on two varieties (Diamont and Sponta).•The longest pre-oviposition period and post-oviposition periods were recorded at 20°C, while the shortest periods at 30°C on two verities.•Adult longevity was decreased with increasing the temperature, whereas the shortest longevity (5.7;5.8 days) was detected at 30°C, and longest (13.7; 13.4 days) at 20°C on two cultivars (Diamont & Sponta).•The mean number of eggs laid per female was (84; 77.6) (142.1; 126.7) and (121.9; 115.8) eggs at 20, 25 and 30°C, on two varieties, respectively, while indicating that the highest number of insect eggs was laid at higher temperature (25°C) on Diamont variety.Bioactivity of some plant extract against P. operculella:The petroleum ether extracts of the seeds of Dill (Anethum graveolens L.); Cumin (Cumium syminum L.); Castor bean (Ricinus cummunis) leaves and the water extracts of Garlic globs (Allium sativum) were evaluated in the laboratory 28±5°C and 70±5% R.H. against P. operculella infestation.The results indicated that the bioactivity of the tested extracts were concentration-dependent, whereas, the inhibition rates of moths resulted from eggs or pupae or moths infestation increased obviously with the rise of concentration.Meanwhile, the bioactivity of all tested extracted was relatively the most to moths infestation all tested extracted than eggs and pupae.