Influence of abiotic factors in occurrence and harmfulness of *Agrotis segetum* (Den. et Schiff.) and *A. exclamationis* (L.) on sugar beets

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**Abstract**

The aim of the research was to improvement of short-term forecasting on determination of optimal time of control these pests that takes place at mass larval hatching. The studies on pests infesting sugar beet crops were carried out in the years 2005-2008. The observation performed during the moth flight from May to September included two species, Turnip moth (*Agrotis segetum* Schiff.) and Heart-and-dart moth (*A. exclamationis* L.). The dynamics of moth flights was recorded in reference to the readings of climatic conditions registered with the field meteorological stations. Thus long term studies were carried out to evaluate a correlation between duration of egg incubation, hatching of larvae and the entire developmental period of cutworms and the temperature and relative humidity. The length of developmental period of two species was examined under control conditions in the growth chambers at three programmed temperatures (17˚C, 20˚C, 24˚C) and relative humidity (50-70%), and under field conditions.

The statistical analysis was performed using the straight-line regression method in order to examine the size and significance of the influence of temperature and humidity of the air on the developmental periods of cutworms studied.

Using the straight-line regression, each of the above dependencies (i.e. 2 species of cutworms x 3 developmental periods x 6 meteorological characteristics x 4 variants of the temperature ranges in the controlled conditions = 144 dependencies, and *A. exclamationis* x 3 developmental periods x 6 meteorological characteristics = 18 dependencies – total of 162) was characterized by the degree of freedom (df), significance level (p-value, p), coefficient of determination (%) and standard error (S).

The lengths of developmental periods both of eggs and larvae of two species of *Noctuinae* depended on air temperature and humidity. There were differences in duration of larval period of *Agrotis exclamationis* comparing to *A. segetum* under field conditions and in the growth chamber at 20˚C.

**Key words:** *Agrotis segetum*, *A. exclamationis*, abiotic factors, line regression, developmental periods of cutworm