

## Life Table Studies of *Helicoverpa armigera* (Hubner) on Chickpea

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### SUMMARY

Life tables to assess the key mortality factors of *Helicoverpa armigera* were prepared on chickpea and artificial diet during 2004-05 and 2005-06. In life table of field collected life stages, egg unviability of 14.55% was found. Whereas in early instar larvae, 34.55% mortality was noticed, in which highest 14.89% parasitization reported due to *Eriborus argenteopilosus* Cameron and 8.94% by *Campoletis chlorideae* Uchida. In late instar and pre-pupal larvae, tachinid fly activity was highest recorded 3.73 and 6.31% parasitism, respectively. Moreover, HaNPV disease infection of 0.60 and 0.41% was observed in early and late instar larvae, respectively. Pupal stage was the most vulnerable stage than other stages and showed suppression of 35.16%, in which tachinid fly recorded the maximum 13.19% parasitization. Life table from field collected eggs revealed highest 13.47 and 13.06 per cent unviability in eggs over other stages on chickpea and artificial diet, respectively. Similarly, in life table of laboratory obtained culture eggs on chickpea and artificial diet, egg stage showed maximum population reduction of 10.00 and 11.11%, respectively over stages. After egg mortality, higher reduction found in the first instar larvae and pupae. The generation survival of *H. armigera* was superior on artificial diet than chickpea.

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Chickpea (*Cicer arietinum* L.) is an important *rabi* season pulse crop of India occupying about 6.93 million ha with average productivity of 808 kg/ha (Anonymous, 2006). Of various insect pests of chickpea, gram pod borer, *Helicoverpa armigera* (Hubner) poses a serious problem for chickpea growers and is a limiting factor in its production. A reduction in yield ranging from 40-50 per cent has been reported and may cause even total loss of the crop (Rai *et al.*, 2003). Till recently, chemical pesticides have been used for controlling *H. armigera*, but despite such a use, the pest could not be brought under control and causing harmful effect on beneficial organisms and thus responsible for ecological disturbances.

Life tables are the most important tools in the pest management, which reveal the most opportune periods and vulnerable stage of the insects in the life cycle. Such ecological life tables record a series of sequential measurements that indicate population changes throughout the life cycle of a species in its natural environment (Harcourt, 1969). Hence, an attempt had been made at Department of Entomology, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during 2004-05 and 2005-06 to study the population fluctuations through life tables for identifying vital clues of population changes to be used for formulating suitable integrated management strategy under field conditions.

### MATERIALS AND METHODS

#### *Field collected life stages:*

Life tables of field collected population for monitoring biotic key mortality factors of *H. armigera* were studied on chickpea (variety-ICCV-2) during two consecutive years of 2004-05 and 2005-06. Different life stages of *H. armigera* were collected from an unsprayed field of chickpea crop cultivated on a 500 sq. m. plot at Central Research Farm and reared under laboratory condition of Department of Entomology, Dr. PDKV, Akola. To record the parasitism of *H. armigera*, collection of eggs, early instar (I-III) and late instar (IV and V) larvae on chickpea were initiated with appearance of pest. For pupal study, the pre-pupal larvae were collected as soon as they appeared in field, reared till pupation, provided with sterilized soil and observation were recorded on pre-pupae, pupae and adult. The sampling of larvae was done at 7 days interval per 25 plants and reared individually in small plastic vials to avoid cannibalism. The collected larval groups were reared on chickpea pods and the food was changed regularly as and when required until pupation of pest or parasitoids observed. Similarly, pupae were kept till pest adult emergence or parasitoids emerged. The observations on total mortality and survival as well as parasitization due to different parasitoids were recorded, separately.

### Key words :

Life table,  
*Helicoverpa armigera*,  
Chickpea.

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