

**Background:**

The development of population dynamics models of *Heliothis* populations in multicropping systems required information on reproductive development, longevity and lifetime fecundity of adult female *Heliothis* in order to simulate the daily input of white eggs to each simulation unit.

Studies with *H. armigera* and other species overseas have shown *Heliothis* spp. to be highly fecund. In the laboratory females may commence laying after a prereproductive period of 2-3 days and lay 1000-2000 eggs during their reproductive lifetime of 5-8 days. However only limited laboratory data was available for Australian *H. armigera* and little or no data is available for *H. punctigera*.. Potential fecundity in many insects is related to adult body size which in turn may be influenced by the quality of food consumed by the larvae. *Heliothis* develop on a range of cultivated and non-cultivated host plants which may vary considerably in their suitability for larval growth. Differences in weight of pupae produced on different crops have been recorded (Fitt unpub. data) which may influence potential fecundity and longevity. What was needed was a relative measure of the effects of host plant on reproductive performance to provide coefficients for the simulation models.

In addition we required data on the effects of seasonal climatic factors, particularly temperature and daylength on rate of reproductive maturation and longevity of both sexes and of egg production in females at different times of the season. No quantitative data was available on such effects.