# A FEASIBILITY STUDY OF THE CONTROL OF ADULTS OF HELIOTHIS SPP. BY DRIFTING A CLOUD OF MONOSIZED DROPLETS ACROSS A COTTON FIELD AT NIGHT

Elizabeth B.A. Bie

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## DECLARATION

This thesis contains no material which has been accepted for the award of any other degree or diploma and, to the best of my knowledge and belief, contains no material previously published or written, or the result of work by another person, except where due reference is made.

Elizabeth B.A. Bie
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## SUMMARY

The possible control of adult Heliothis punctigera and Heliothis armigera in flight, by drifting a cloud of small droplets of insecticide across the canopy of a cotton crop at night, during the time of peak moth activity, has been investigated.

Two insecticides, fenitrothion technical and fenvalerate, were initially tested for their effectiveness against adult Heliothis spp. with a bioassay involving topical application. Fenvalerate proved to be the most effective, with an LD50 of 0.21 μg/g body weight, and was therefore chosen for use in the spray trials formulated as Sumicidin ULV (active ingredient: fenvalerate 40 g/l).

Six spray trials were carried out on consecutive nights, between 2100 and 2400 h. The trials were conducted under conditions of inversion and light winds - typical of the location (northwestern N.S.W.) and time of year (January to March). The droplet cloud was created by a spinning disc atomizer mounted on the back of a four-wheel-drive vehicle.

The moth population was estimated by flushing them from plants along transects within the crop and by pheromone traps: egg counts were also made. Analysis of the spray trials showed that it was possible to drift an insecticide at lethal concentrations across the crop canopy under inversion and light winds at night. Moth numbers were unusually low, so the effect of spraying on the moth population and egg lay could not be determined.