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COTTON RESEARCH COUNCIL

PROJECT TITLE: DEGRADATION OF INSECTICIDES

PROJECT CODE: CS17L

SUPERVISOR: Mr A. Wilson

FINAL REPORT

AIMS

To determine the various factors affecting the loss of activity of insecticides on cotton over time.

To determine the relative persistence of the range of insecticides used to control cotton pests, particularly Heliothis spp.

The factors affecting loss of activity of insecticides on cotton foliage were determined to include temperature, rainfall, volatility, rapidity of absorption and persistence in the plant and growth dilution by foliage expansion. A standard test was developed to determine the relative persistence of various insecticides under summer field conditions in the absence of rainfall (Wilson et al 1983). The test takes the form of a bioassay using newly hatched Heliothis larvae.

The persistence of water-based (E.C.) versus oil-based (ULV) formulations of Endosulfan, a key insecticide in cotton pest control was also determined using the larvae bioassay over 2 seasons. The oil-based formulation, which is the most commonly used was confirmed by bioassay to be considerably more persistent than the water-based formulation. In addition bioassay, chemical analyses of residues were conducted on leaf samples. The results, largely confirmed the bioassay results.

The persistence and toxicity to Heliothis larvae of a chitin synthesis inhibitor 'Atabron' was also investigated. This insecticide represents one of the few new chemical groups to be introduced in recent years. The chemical was found by bioassay to be highly persistent, having a life on mature foliage similar to pyrethroids. One disadvantage is that larvae are only affected at the time of moulting and feeding may continue until an instar is completed.

Reference.

Wilson, A.G.L., Desmarchelier J.M., Malafant K. (1983)
Persistence on cotton foliage of insecticide residues toxic to Heliothis larvae.
Pestic. Sci. 14:623-633