US31C Executive Summary

Plain English Summary

This project aimed to improve technical capability to study the transport off-farm in water and on sediments of pesticides such as endosulfan and members of the benzoyphenylurea (BPU) family. This was achieved mainly as the result of adaptation of existing enzyme-linked immunosorbent assays (ELISAs) for field studies, as well as the generation of new assays. These studies have indicated that endosulfan sulfate is formed as a biological product and that this the main reason for persistence of endosulfan residues in ponded runoff water. The project has also resulted in the availability of a new group-specific enzyme-linked immounosorbent assay (ELISA) for residue analysis of the whole family of BPU pesticides and of a compound-specific ELISA for flufenoxuron. Both of these assays were able to be applied in studying the dissipation of BPUs in water and soil. BPU residues in water could be quantitatively analysed directly without the need for cleanup, and soil samples required only a simple extraction with 90% methanol. Spike and recovery studies for five BPUs in soil and water indicated that these assays quantified BPUs with good recoveries. The assays were very specific for BPUs, and neither the environmental matrices nor other cotton agrochemicals interfered with the detection of BPUs. The presence of particulates and dissolved organic compounds in water and soil extracts did not interfere with the assays. An ELISA for the quantitative determination of pyrithiobac-sodium (Staple) developed in the USA was validated with Australian soils in this project. These studies confirm the utility of ELISA tests as a simple means of monitoring the environmental fate of cotton pesticides. The results of this project are published in four papers in recognised journals and nine papers given at conferences.