

EXECUTIVE SUMMARY AND RECOMMENDATIONS TO THE CRDC

The key findings from the research, which are of direct relevance to the cotton industry, are as follows:

1. **Anaerobic Biodegradation of Endosulfan**

Endosulfan can be degraded to a non-toxic compound by indigenous soil microorganisms when these are incubated with endosulfan under conditions where organic matter, is not limiting. Indigenous soil microorganisms isolated from freshwater sediments including tailwater retention drains were cultured in the laboratory in liquid medium. These cultures could degrade the principal isomer of endosulfan at high rates, to the relatively non-toxic degradation product, endosulfan diol.

These results indicate that endosulfan may be degraded under environmental conditions where there are low oxygen concentrations.

3. **The Degradation of Endosulfan in Soil**

Endosulfan dissipated from contaminated soil from a sullage pit, under both sterilised and non-sterilised conditions.

However, biodegradation could only be distinguished from non-biological losses in the cotton-growing soil where endosulfan was present at low concentrations (<2 ppm).

In sullage pit soils, where endosulfan was present at relatively high concentrations (approximately 400 ppm), losses of endosulfan were primary due to volatilisation. As indicated previously, endosulfan has been shown to readily volatilise from free water surfaces.

The volatility of endosulfan demonstrated in the current study indicates that this will be a major route for its loss in the field and probably accounts for its observed high rates of loss immediately after application.

4. **Prospects for Full-Scale Remediation of Sullage Pit Wastes**

Full-scale remediation projects have recently been conducted by Minenco Pty Ltd on a number of industrial sites that have soil contaminated with chlorinated hydrocarbons. A pilot-scale trial determining the rate of biodegradation of pesticide and herbicide wastes in sullage pit soil could be conducted and would provide sufficient information for the full-scale design and implementation of a biological process to treat these wastes.

It is likely that a bioremediation process using a composting procedure would be most suitable for the treatment of sullage pit wastes.

Further details of CRA's capability in the area is available if the CRDC is interested.