

**Best Management Practices to Minimise Pollutant
Transport from Cotton Production Systems**

CRDC FINAL REPORT

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Plain English Summary

The transport mechanisms and fate of cotton pesticides and nutrients were investigated as part of a major R&D program undertaken by the cotton industry in the early 1990 s. Key findings were that the highest risk of moving pesticides off site occurred:

- early in the growing season
- during storms that caused runoff and sediment losses
- where soil cover was low.

To reduce the risks, growers sought practical solutions for reducing pesticide movement.

In 1997 after a series of industry and grower meetings, the project Best Management Practices to minimise Pollutant Transport from Cotton Production Systems was developed. The aims were to develop practical and innovative management practices that would reduce off-site movement of soil, water, nutrient and pesticides. In particular, the goal was to apply small scale research findings on farm at the paddock scale to assess the practicality and feasibility of growers implementing the systems. Trials began first in the Emerald Irrigation Area (EIA) and extended into NSW in the second year.

Three management practices were trailed on farms :

1. wheat-cotton double crop rotation,
2. polyacrylamide (PAM) application to irrigation water
3. planting of vegetative filter strips in irrigation channels.

Sediment, nutrient and pesticide movement from rainfall and irrigation runoff were monitored over two seasons at a paddock scale of 30 Ha for the three treatments and an adjacent conventional cotton treatment.

All three techniques were highly effective at reducing soil erosion, nutrient and pesticide movement. Wheat-cotton rotation reduced soil erosion by 70% and endosulfan concentrations by 40%. Three less insecticide sprays were needed for the wheat-cotton rotation crops. PAM applications to irrigation water reduced sediment loads in runoff by 80%. Vegetative strips filtered runoff water entering tail drains and trapped 65-85% of total endosulfan and 67% of chlorpyrifos in the sediment from runoff water.

The project has built on the research principles developed in the CRDC Minimising Pesticides in the Riverine Environment Program.

Three practical techniques developed from the work are now being used by growers to reduce soil erosion, nutrient and pesticide movement leaving farms. The on farm action research proved to be highly effective for maintaining grower involvement and adoption of research.