ORD CATCHMENT REFERENCE GROUP

NRM Facts

PESTICIDE MANAGEMENT IN THE ORIA

PESTICIDE PROJECT

In 2002 work commenced on the Ord Land and Water-CSIRO Pesticide Project, the objective of the project was to test methods and develop guidelines to reduce the movement off farm of pesticide residues within farm tail-water. Through a series of growers workshops, throughout the life of the project, a total of nine strategies were identified for experimental work on both **colloidal**[1] and **soluble**[2] pesticides. Five of these strategies were selected due to funding capacity for investigation, as outlined below.

INCORPORATION (Experiment 1 and 4)

Incorporating pesticides with power harrows or cultivator bars before irrigating was found to be a highly effective method to minimise off-site movement of pesticides.

The decrease in movement ranged from 38% to 75%. A greater decrease was found with colloid-associated pesticides such as endosulfan (75%). Soluble pesticides such as atrazine registered a decrease of between 38 and 53% in respective experiments.

As of October 2005 five areas where atrazine was incorporated as a trial have had a weed count done to test the practice for weed control. Four of those sites showed no difference between incorporation and non-incorporation techniques; however one trial did show a greater population of weeds on the incorporated site.

Ord Land and Water intends to continue these trials with farmers to test this application technique on weed control efficiency.

1 Colloidal: Pesticide particles are transported by means of attaching themselves to soil particles.

2 Soluble: Pesticide particles are transported by becoming dissolved in water.

TARGETED APPLICATION (Experiment 2)

Spraying pesticides to the top of the bed only was found to be a highly effective method to minimise off-site movement of pesticides, decreasing it by 83%.

This form of pesticide application is already in use by farmers within the ORIA as a means to reduce some pesticide costs and to reduce off-site movement of endosulfan when spraying small plants. The process generally applies a full rate of pesticide to a strip of ground that constitutes 25 – 40% of the cropped area but not the water furrows.

A weed count was done on the experimental site to test the practice's efficiency to control weeds in the furrows when atrazine is applied. The count showed no difference between the trial site and the control site.

Ord Land and Water intends to continue looking for opportunities with farmers to test the efficiency of this practise on weed control.

APPLYING *PAM (Experiment 3 and 5)

There was mixed success with these experiments. In the first the colloid-associated pesticide endosulfan was applied prior to PAM being incorporated into the irrigation cycle by means of pucks placed under the outlet of each siphon.

Results showed that PAM was highly effective in minimising off-site movement of colloid-associated pesticides. The decrease in off-site movement of the endosulfan was 54%.

In addition two more chemicals, bupirimate (Nimrod) and chlorothalonil (Bravo) were found to be present in the test samples from a previous application. Amounts of these pesticides leaving the treated and non-treated areas were reduced by 38% for bupirimate and 49% for chlorothalonil.

In the second experiment the soluble pesticide atrazine was used for the experiment and liquid PAM applied at the Dethridge wheels. Although PAM acts primarily on colloidal particles by settling them out of the water flow it was considered that PAM may still have a positive effect in restricting movement on the more soluble pesticides. Results showed that PAM had no effect on minimising the off-site movement of atrazine.

FURTHER INFORMATION

Please contact Ord Land and Water
Phone (08) 9169 2222
PO Box 1804
KUNUNURRA WA 6743
www.olw.com.au

Australian Government
Government of Western Australia
RANGELANDS NRM Co-ordinating Group

ORD CATCHMENT REFERENCE GROUP

NRM Facts

APPLICATION vs IRRIGATION

An experiment looking at spraying vs. irrigation timing was prioritised by farmers but not done due to funding constraints. However the concept is a part of a current local management strategy for endosulfan use where it is recommended that irrigation be scheduled for no earlier than three days after application. This time lag in application and irrigation is based on the assumption that the pesticide will degrade over a period of time due to environmental influences such as temperature and sunlight. The voluntary adherence to the safeguards along with a reduced reliance on the pesticide has significantly reduced the risk of adverse impacts of endosulfan on the riverine environment.

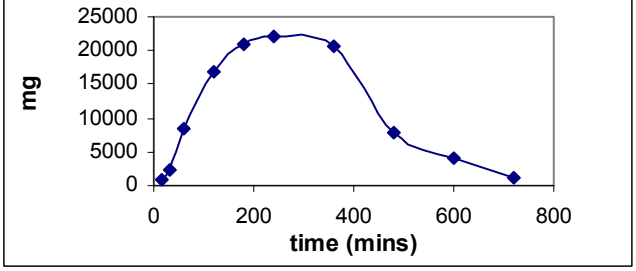
On this basis maintaining as large a gap as practical between pesticide application and irrigation should be a part of farm chemical management strategies.

An issue with this is that some pesticides rapidly reduce in efficacy as they degrade and they require irrigation to activate (i.e. atrazine), so a balance needs to be achieved.

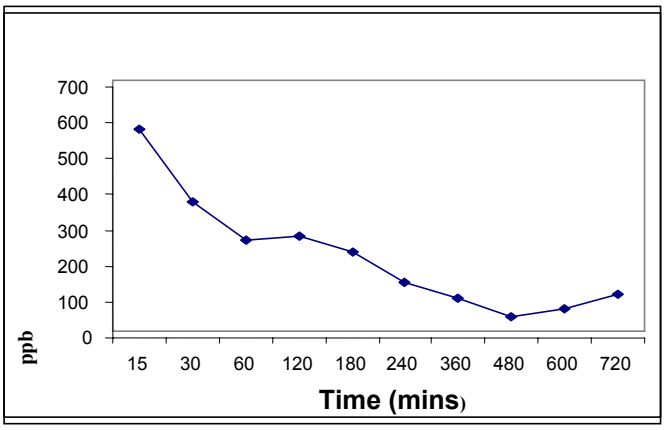
REDUCING RUNOFF

On examination of a typical graph showing the mean amount of pesticide leaving the paddock over a period of time it can be seen that most pesticide leaves the paddock between 100 minutes and 400 minutes after water first starts to run out of the tail drain (Graph 1). However, for as long as water moves off the paddock there is some pesticide movement (Graph 2). Reducing the time of irrigation could therefore help reduce the total load of pesticides leaving a paddock in the first irrigation after spraying.

Graph 1: Mean amount of pesticide leaving the paddock after irrigation



Graph 2: Concentration levels leaving the paddock



Pesticides likely to move with water.	
Chemical	**Trade name**
2,4-D	24D Amine
Atrazine	Atradex
Ametryn	Gesapax Combi
Carbaryl	Bugmaster
Thiodicarb	Larvin
Diuron	Diurex
Fenarimol	Rubigan
Isoxaflutole	Balance

Pesticides more likely to move with colloids	
Chemical	**Trade name**
Propiconazole	Tilt
Mancozeb	Diathane
Pendimethalin	Stomp
Trifluralin	Trefelan
Endosulfan	Thiodan
Glyphosate	Round Up
Chlorpyrifos	Lorsban
Cypermethrin	Scud
Chlorothalonil	Bravo
Bupirimate	Nimrod

Australian Government

Government of Western Australia

RANGELANDS NRM Co-ordinating Group