A Field Study to Assess Water Contamination after Application of Cereal Herbicides

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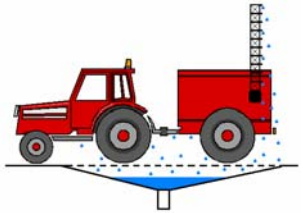
Objectives:

- How do pesticides get into water?
  - Drainage / Runoff
  - Point source / Diffuse
- How do we measure this?
  - Surface runoff
  - Un-drained
  - Point source yard spillage / washings

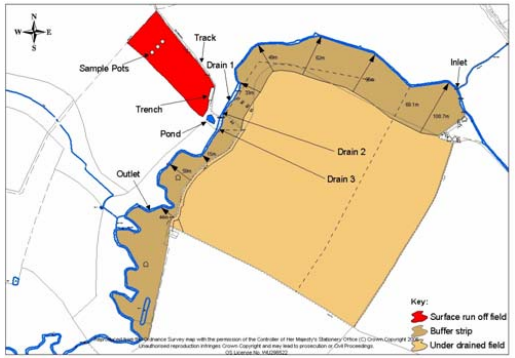
Sloping field surface runoff experiment

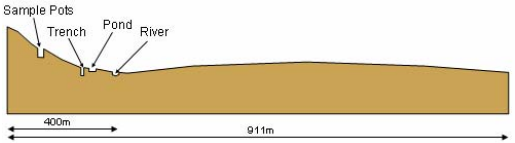
Flat under-drained field experiment



Point source / yard spillage experiment

Fields and Sample Points used in the Trial





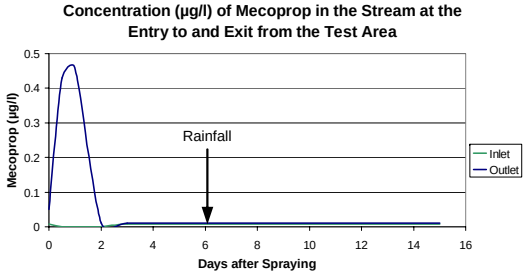
Samples taken from points shown on diagram in 1 litre glass bottles. Analysed by Severn Trent Laboratories using Gas Liquid Chromatography

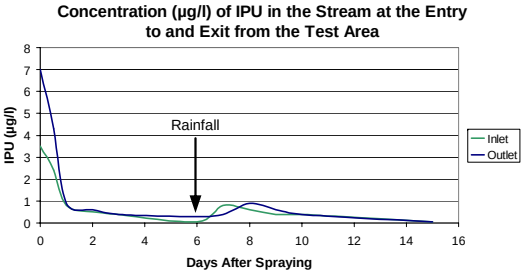
Conclusions:

- When applied correctly under suitable weather conditions – little loss to drainage
- Confirms potential importance of point source
- Reduce contamination by elimination of point sources and application in suitable weather conditions

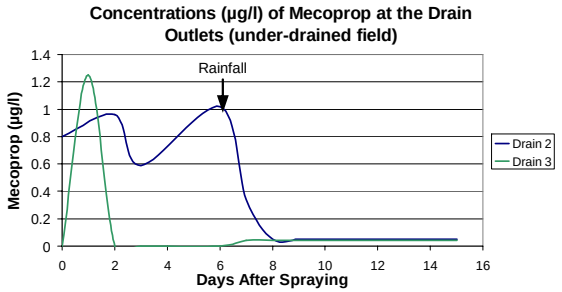
Results:

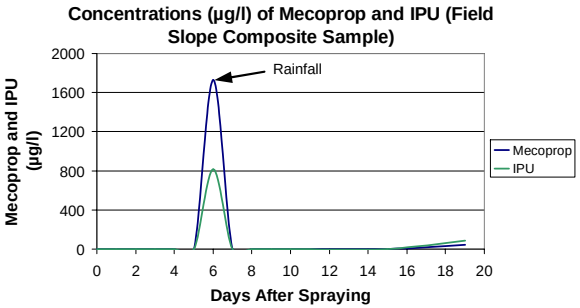
Overall picture in Stream





The initial concentration of IPU must have originated upstream as it was present before application to the test fields. No significant concentrations of IPU were found in the stream at later times, showing attenuation of the actives at some point. It is likely that the buffer strip was at least a contributory factor in preventing contamination of the stream from the sloping field. The mecoprop-p seen at days 1-2 is probably attributable to by-pass flow into the field drains . No further contamination was evident even following heavier rain on day 19.





	mecoprop	IPU	Volume
Wash down of yard after first fill (mecoprop-p only)	128	ND	50 litres
Wash down of yard after second fill (addition of IPU)	93	ND	50 litres
Final clean of sprayer and wash down of yard	21,600	7,500	400 litres

Underdrained field

An initial concentration seen in both drains on days 1-2 is presumed to be due to bypass flow. The further peak seen on day 6 (drain 2) is probably residual content washed out by the rain shower. No further concentrations were seen.

Sloping Field

Following application low concentrations of both IPU and mecoprop-p were found in the sampling trench and the pond at concentrations consistent with spray drift. After rain on day 6 there was very substantial concentrations of both actives found in the sample tray at the foot of the slope (1720 µg/l meco, 818 µg/l IPU). By day 19 these concentrations had reduced to 46 and 87 µg/l respectively.

Point Source in Yard

Highest concentrations were found in the yard following final wash off of equipment. This reinforces the importance of washings as a major potential source of point source contamination.