

DIURON RESIDUES IN IRRIGATION WATER

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Diuron is widely used by growers and government authorities in the Murrumbidgee and Coleambally Irrigation Areas (M.I.A. and C.I.A.) of New South Wales to control cumbungi (*Typha* spp.) in irrigation channels. This chemical is usually sprayed onto the exposed soil surface of empty channels during the winter. In the spring, with the aim of removing any surplus residues, the first discharge of water is wasted to the drainage system before normal irrigation is resumed.

Both the efficiency and safety of diuron use in irrigation channels have been questioned. Weed control after application of diuron has been inconsistent and a few germinating rice crops have been damaged following irrigation from treated channels. There is also concern that the drainage water, which is partly re-used in the irrigation districts, could become contaminated.

We suspect that differences in the distribution and breakdown of diuron in soils of contrasting texture may be responsible for the variable weed control observed and could also affect the efficiency of 'flushing out' surplus residues. In 1974-75, with the aim of investigating transport and dissipation processes, diuron was applied to light- and heavy-textured soils in two experimental channels in the M.I.A. and residues were monitored in the sediment and water.

It has first been necessary to investigate the contribution of several metabolites to the phytotoxicity of the residue. Diuron and its two phytotoxic metabolites, DCPMU and DCPU, were separated by chromatography on impregnated glass fibre plates. The relative concentrations were determined after elution by electron-capture gas chromatography. Another metabolite of diuron, 3,4-dichloroaniline, is relatively non-phytotoxic. Bioassay was used as a confirmatory method in water analysis.

The relative concentrations of diuron, DCPMU and DCPU measured in the soil about 16 weeks after treatment were about 1:0.29:0.04 and the contributions to phytotoxicity were about 1:0.14:0.01 respectively. These results suggest that measurements of diuron *per se* may underestimate the phytotoxicity of the residues by up to 15 per cent.

Preliminary results raise some interesting points with regard to interpretation of the legally-established tolerances of 0.1 ppm for water. The maximum concentrations of diuron