

DISSIPATION OF ATRAZINE IN IRRIGATED RIVERINA SOILS

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Many reports have appeared in the literature of crop damage caused by residues of atrazine remaining from an application to a preceding crop. It was therefore considered prudent to investigate the dissipation of atrazine under irrigated conditions in southern New South Wales.

Atrazine, applied to a sorghum crop at rates up to 10 kg a.i./ha dissipated to concentrations below 0.05 ppm 11 months after application. Breakdown followed first order kinetics. The rate of dissipation did not differ significantly between application rates.

Leaching was not a significant avenue of dissipation. No atrazine was found below the depth of cultivation 10 months after the last of three annual applications.

Dissipation was not significantly affected by cultivation or chemical removal of volunteer plant growth during winter and early spring.

Rice, sown approximately 11 months after final atrazine application, was not adversely affected by any atrazine treatment.

In laboratory incubation studies atrazine disappeared faster from a Birganbigil silty loam, similar to the soil used for the field experiment, than from a Wilbriggie clay loam, a Billabong clay or a Gundaline clay. The Birganbigil soil had the lowest clay content and cation exchange capacity of the soils used, but the highest organic carbon content (1.42%). Even in these heavy, mineral soils organic matter content appears to be important in determining soil-herbicide interactions.

Many reports of long residual activity of atrazine emanate from regions where winter temperatures are very low or alternatively from irrigated desert situations where soil conditions are very dry during the non-cropping season. In either of these situations degradation of the herbicide by chemical or biological pathways would be much slower than under the moist, temperate winter conditions of southern New South Wales.

It was concluded that where atrazine is applied to an irrigated summer crop in the Riverina, residues are unlikely to damage summer crops sown the following spring. However, winter crops sown approximately 6 months after atrazine application to a preceding summer crop could be damaged by herbicide residues. Problems are likely to be greater on soils with low organic carbon contents.