

Checking on a weed-killer

Submerged water weeds, if they get out of hand, can reduce water flow in irrigation channels to a trickle. If a chemical called acrolein is added to the water in weed-throttled stretches so that a concentration of 3 p.p.m. persists for an hour, most of the weeds die. But what happens to the acrolein, which is extremely toxic?

Research by scientists at the CSIRO Division of Irrigation Research at Griffith, N.S.W., has shown that it quickly changes to a safe compound. Their findings confirm the safety of the existing practice in New South Wales and Victoria of resuming water deliveries from irrigation channels 48 hours after acrolein treatment.

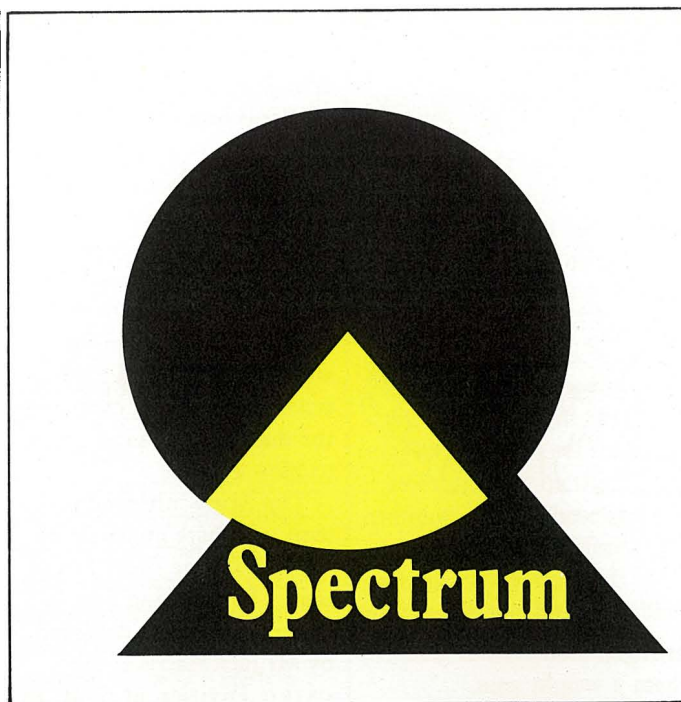
The Division's first research results suggested a different outcome. Dr Kathleen Bowmer found in one test that only 5% of the acrolein put into an irrigation channel disappeared in 4½ hours. Then she found that two-thirds of the quantity added to water in a large tank remained 8 days later.

These disquieting findings conflicted with the experience of the New South Wales Water Conservation and Irrigation Commission that weed control from each application of acrolein continued for only a few hours.

One possible explanation was that the acrolein, although continuing to give a positive reaction in the test used to measure it, changed chemically in water and lost toxicity. Tests were devised to check if this was the case.

It was. In one test, on rates of photosynthesis in one type of water weed, Dr Bowmer found that 'aged' acrolein was at most one-tenth as toxic as the fresh chemical.

Dr Bowmer and Dr Dick Lang worked out a way of



An irrigation channel before and after acrolein treatment.



Sheep gained weight on these pellets made of government paper.

measuring only active acrolein. Then, in collaboration with New South Wales and Victorian irrigation authority officers, they re-examined losses from water in irrigation channels. They found that the chemical degraded very quickly. In two channels where they measured the rate of loss of active acrolein, half had gone within 4-5 hours.

Loss of acrolein from water by volatilization and degradation. K. H. Bowmer, A. R. G. Lang, M. L. Higgins, A. R. Pillay, and Y. T. Tchan. *Weed Research*, 1974 (in press).