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Pest Management Science, Volume 58, 2002. Pages 677-686.

"Dissipation of triclopyr herbicide applied in Lake Minnetonka, MN concurrently with Rhodamine WT dye"

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ABSTRACT

Fluorescent dye was applied concurrently with triclopyr in two 6.5-ha treatment plots in Lake Minnetonka, MN for data collection to support full aquatic registration of this herbicide. The herbicide and dye mixture was applied by airboat to Phelps Bay with weighted, trailing hoses to maximize uniform distribution of these materials in the water column. A surface application was made to the Carsons Bay plot to attain theoretical triclopyr and dye concentrations of 2500 and 10 ug litre-1 respectively. Water samples collected at various times following application showed very little movement of the herbicide and dye out of the Carsons Bay plot. Triclopyr residues moved to a greater extent our of the Phelps Bay plot. The dye was easily tracked in real time using field fluorometers, which allowed new sampling stations to be established to monitor this movement. Dye concentrations were strongly correlated to herbicide concentrations (r2=0.97 in both plots) but were less predictive of the triclopyr metabolite 3,5,6-trichloropyridinol (TCP; r2=0.82 in Phelps and r2=0.73 in Carsons), probably due to its differential metabolism and degradation. The inert dye can be used to compare the dissipation of herbicide residues by dilution versus microbial or other breakdown processes. Vertical sampling of dye in the water column showed that surface applications of aquatic herbicides can delay uniform mixing in the water column by several days. Although the dye aided the tracking of residues outside the treatment areas, predetermined sampling times and stations were still needed if very low concentrations of herbicide were to be detected at times and stations where the dye had been diluted below its limit of detection.

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