CHLOROACETANILIDE HERBICIDE METABOLITES IN WISCONSIN GROUNDWATER.
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Alachlor, metolachlor and acetochlor belong to the chloroacetanilide class of herbicides. Each of these three parent compounds break down into unique ethane sulfonic acid (ESA) and oxanillic acid (OA) metabolites. The metabolites appear to have higher leaching potential than the parent compounds due to higher solubility and mobility in the environment. The main use of these herbicides in Wisconsin is for pre-emergence control of annual grass weeds in corn. In 2000, the total amount of active ingredient of these compounds applied in Wisconsin was approximately 3.8 million pounds. Except for alachlor ESA, laboratory methods for these metabolites did not exist until recently and there was no data on their occurrence in Wisconsin groundwater. Groundwater standards have not been established for these compounds and relatively little is known about their toxicology.

Starting in 1999, the Wisconsin Department of Agriculture, Trade and Consumer Protection has conducted two studies on the occurrence of chloroacetanilide herbicide metabolites in Wisconsin groundwater. The first study sampled 27 monitoring wells, 22 private drinking water wells, and 23 municipal wells. Wells were selected based on previous detections of pesticides or proximity to agricultural fields. Results showed detections of the ESA and OA metabolites of alachlor and metolachlor in over 80% of monitoring wells, over 90% of private drinking water wells, and over 50% of the municipal wells. The metabolites of acetochlor, which has only been used since 1994, showed a lower frequency of detection. Concentrations of the metabolites in groundwater ranged from near the level of detection (0.10 ug/l) to 42.1 ug/l.

The second survey involving chloroacetanilide metabolites was a statewide survey of pesticide and nitrate-nitrogen in private drinking water wells. The survey was completed in May 2001 and was a follow-up to similar surveys conducted by DATCP in 1994 and 1996. This survey included 336 wells which were selected using a stratified random sampling design. The main goal of this survey was to establish detection frequencies and concentrations for pesticides and nitrate-nitrogen in Wisconsin groundwater. Results of this study showed that alachlor ESA and metolachlor ESA were the most commonly detected compounds. The statewide estimates of the proportion of detections for alachlor ESA, metolachlor ESA, alachlor OA, and metolachlor OA were 27.8, 25.2, 3.7 and 6.4%, respectively. Estimates of the mean detect concentrations for these compounds ranged from near the level of detection to 1.84 ug/l. Parent alachlor, metolachlor and acetochlor were rarely detected.