

PESTICIDES AND WATER QUALITY

Through the 1980s there was a growing concern regarding the quality of groundwater in Iowa. In part this is because over 70 percent of Iowans depend upon groundwater for their drinking water and clean groundwater is a valuable resource for both agriculture and industry. Once groundwater becomes contaminated, it is very costly to clean it to a useable condition. In 1987, the Iowa General Assembly enacted the Groundwater Protection Act, which placed authorities and responsibilities on several state agencies and created the Leopold Center for Sustainable Agriculture at Iowa State University, the Center for Health Effects of Environmental Contamination at The University of Iowa, and the Waste Reduction Center at the University of Northern Iowa.

To fund the groundwater protection activities, the Act created fees for the sale of pesticides, fertilizers, and tipping at sanitary landfills. These groundwater funds are distributed as stipulated by statute [Chapter 455E Iowa Code] to the agencies and centers.

The Iowa Department of Agriculture and Land Stewardship (IDALS) was directed under the Act to collect information on the sales of pesticides. While the sales data is confidential business information, it was recognized that the data could be transformed to assist in a better understanding as to where specific pesticide active ingredients were being used. To accomplish this task, the Pesticide Bureau of IDALS has been working cooperatively with the Iowa Department of Natural Resources Iowa Geological Survey (IDNR/IGS) and Iowa State University Extension (ISUE). The U.S. Environmental Protection Agency Region VII (EPA) has provided matching funds to IDALS to support these pesticide and water quality protection activities.

The Pesticide Bureau, in cooperation with Agricultural Statistics Bureau of IDALS, has developed a Sales Database that has all of the data that has been provided by the pesticide dealers since 1989. The information consists of the EPA registration number for each pesticide product, trade name, and dollars sales for each product for which there is \$3,000 in sales or more. Additionally, each product containing atrazine, a corn/sorghum herbicide, must include all sales and pounds or gallons of product sold.

To transform the confidential sales data, the Pesticide Bureau and ISUE develop conversion factors for each product annually that can be used to calculate the approximate number of pounds of active ingredients for chemicals of interest. The calculated pounds of selected active ingredients are then provided to the IDNR/IGS who make Geographic Information System (GIS) images of the calculated data. The data is distributed from each point of sale by using a 30-mile radius and composited into a statewide map by selected levels of active ingredient pounds. The GIS maps provide a statewide view of areas of use of the selected active ingredients.

Using the Iowa Pesticide Sales Database: Estimating use geostatistically for points of sale.

The GIS data can be compared to pesticide detection data from water samples that the IDNR/IGS has compiled in a statewide database, IAPEST. The areas of concentrated use and detections of pesticide active ingredients are one way to begin to measure the movement of these chemicals in surface and ground water. The maps also reflect how the pesticide use changes over time. One good example is how the use of atrazine has changed from 1989 to 2002.

The U.S. EPA regulates pesticide use in the United States through the pesticide product label. The EPA approved label becomes a legally binding contract between the person who uses the pesticide and the government. In short, the label is the law. Some pesticide products are restricted for use only by certified applicators. The restrictions can be based on human health or environmental concerns.

Atrazine is a restricted use herbicide that has been used to control weeds in corn since 1958. It could be applied in 1989 at a labeled (legal) rate of 4 pounds per acre per year. In February 1990, using provision of the Iowa Groundwater Protection Act of 1987, IDALS adopted an administrative rule that lowered the maximum rate of atrazine due to a concern about possible contamination of groundwater by the herbicide. The label rate was lowered to 1.5 lbs./acre/year in areas of northeast and north central Iowa that are most vulnerable to groundwater contamination and 3 lbs./acre/year in the rest of the state. Requirements on setbacks for mixing, loading, or application activities from wells, streams, lakes, sinkholes (depressions associated with limestone geology in northeastern Iowa) and agricultural