

PESTICIDE RUNOFF IN THE
LAKE SPRINGFIELD WATERSHED

AN ADDENDUM TO
THE SEDIMENTATION AND WATER QUALITY
SECTION OF THE LAKE SPRINGFIELD
WATERSHED RESOURCE PLAN OF 1990

AUGUST
1995

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INTRODUCTION

The sedimentation and water quality section of the 1990 Lake Springfield Watershed Resource Plan focused on the issues of sediment, nitrogen, and phosphorus loadings that enter Lake Springfield each year. These issues remain vital concerns. The only mention of pesticide issues in the 1990 Plan was the persistence of historically used pesticides and their breakdown products such as dieldrin, chlordane, and heptachlor epoxide. This addendum enlarges the scope of the plan to include problems associated with the runoff of currently used farm pesticides from fields and specifically the resultant contamination of Lake Springfield with elevated levels of atrazine.

PROBLEM STATEMENT

The City of Springfield draws its drinking water from Lake Springfield, a 4200 acre reservoir. The Lake Springfield watershed comprises a 265 square mile area southwest of the reservoir and is fed by Sugar and Lick Creek and their tributaries. The watershed is 88% cropland. (The watershed is more fully characterized in the 1990 Plan.)

The City, in order to produce drinking water in compliance with drinking water quality standards, has been required in 1994 and 1995 to enhance its treatment with elevated concentrations of powdered activated carbon (PAC) to reduce the high concentration of atrazine from the raw Lake Springfield waters down to a level of 3 ppb in the finished drinking water. Concentrations of atrazine in the raw water were known to be at least as high as 14 ppb in 1994 because the finished water also contained this level of atrazine in the EPA quarterly sample of April 1994. Concentrations of alachlor, cyanazine, simazine, metribuzan, metolachlor and 2,4-D were also present in the April 1994 sample. PAC treatment beginning in late Summer 1994 and continuing in 1995 reduced the atrazine concentrations to below 1 ppb and also reduced the presence of the other chemicals to below detectable levels. The City's treatment cost for carbon from July 1994 through March 1995 was \$220,000, significantly greater than the typical annual cost of \$35,000 for PAC used to treat for taste and odor concerns.

Concentrations of atrazine in various parts of the lake were monitored in 1995 to track the flow of the chemical as it entered the lake once again in April 1995. Prior to April rainfall, residual levels of atrazine from the previous year remained at approximately 2-3 ppb. Levels as high as 25 ppb were found in the lake in May 1995. The highest level monitored at the water plant intake in 1995 was 17 ppb. Treatment cost between April and August 1995 was \$76,000. Another \$7,000 on monitoring had also been spent by the City since atrazine contamination had become evident.

It is recognized that chemical products that wash off the farm grounds do not perform their intended function of weed control on croplands. Reapplication of herbicides adds additional chemical products to the environment and represents additional costs to the farmer. While atrazine is the current chemical of concern, it is the goal of this committee to recommend strategies for reducing all chemical losses from fields. We believe that if certain land use and pesticide use strategies are adopted, pesticide runoff can be significantly reduced. We believe it is the farmer's and landowner's responsibility to control products introduced to the environment.

GOALS

- * Summarize and document research on filter strip efficiencies of reducing chemical runoff and distribute this information to farmers and landowners.
- * Develop model farm plans on 25 farms in the Lake Springfield Watershed and from these plans develop a goal for the number of acres of filter strips that need to be incorporated into watershed farms.
- * Develop demonstration farms for filter strips and other BMPs.
- * Develop site specific monitoring programs for atrazine movement under various management practices.
- * Publicly recognize farmers and landowners implementing BMPs.
- * Ask IDOA to perform random audits of pesticide use in the watershed.
- * Encourage reduced mowing along roadside ditches to once per year after the nesting season.
- * Encourage the development of earthworm populations and other management techniques to improve internal drainage of soils.
- * Encourage farmers on non-highly erodible soils (this represents 70% of the watershed) to go with a half no-till system:
 - A) No-till beans into corn stubble.
 - B) For corn into bean stubble, use a one-pass combination tool prior to corn planting. This will reduce early season annual weeds and incorporate atrazine.
- * If not in a no-till system, encourage use of alternative products to atrazine.
- * Eliminate early season preplant application of atrazine on frozen ground.

- * Encourage the use of split applications of atrazine: 2/3 preplant, 1/3 post application.
- * Encourage farmers to never preapply atrazine prior to March 1st.
- * Develop surcharge for atrazine use in watershed to pay for water treatment. Exempt farmers with approved conservation plans.
- * Develop tax abatement or reduction for properties in permanent buffer zones.
- * Encourage the development of annual buffers in areas of minor seasonal concentrated flow.