

BIG SPRING BASIN DEMONSTRATION PROJECT

Roger A. Koster, Field Coordinator

Systematic monitoring of groundwater quality at the Big Spring Trout Hatchery and from tile lines, springs, wells, and surface streams in the Big Spring Basin (BSB) was initiated in the fall of 1981 and continues through today. The analysis of this water quality data shows that elevated levels of nitrate is widespread as well as some concern for pesticide contamination, with the higher levels of both in surface runoff waters and sediments.

In the 103 square mile Big Spring Basin in northwest Clayton County there are no cities or towns, no manufacturing plants or commercial industries, and no municipal waste treatment facilities. Water quality changes are associated with farming systems in the basin area. Corn, oats, and alfalfa fields, swine, dairy cows and beef animals dominate the terrain.

Big Spring is significant because it is one of very few places in the world that provides a natural field laboratory for the study of how surface activities affect groundwater; specifically farming activities. This unique geological feature means that nearly all of the groundwater within the basin exits at Big Spring, so scientists can easily measure how surface farming activities affect the quality of groundwater. By 1983 the citizens of northeast Iowa were well aware of the elevated levels of nitrate in their drinking water. Local citizens' groups began working with existing organizations and agencies to establish a working task force consisting of 13 federal, state, local and industrial organizations. As a result of the task force's efforts, an overall funding strategy was developed for a seven-year program. The program was designed to identify, demonstrate and encourage adoption of management practices to protect groundwater. Funding for the Project was approved by the 1986 Iowa Legislature, including on-farm field demonstrations of Best Management Practices to protect and improve groundwater, soils, surface waters and improve farm profitability.

EDUCATIONAL ACTIVITIES

Farm-to-farm surveys of the 229 residents in the Big Spring Basin were conducted in 1984, 1986 and 1987. The survey addressed the physical attributes of land used for

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crop and livestock management along with the attitudes of the citizens concerning groundwater quality. The survey provided an evaluation of the effectiveness of initial educational efforts by county and area extension staff, and others. The survey revealed:

- * In 1984 few farmers gave credit to alfalfa and animal manure as nitrogen sources for corn production;
- * By 1986 many farmers had reduced their nitrogen rates for corn by an average of 16 units per acre, primarily by giving credit to alfalfa and animal manure (additional reductions were noted in 1987);
- * 71 percent of the respondents stated that protecting water quality was a priority issue. Of the six issues that were posed to the respondents, water quality shared top rating with profitability in agriculture as the major concern;
- * 73 percent of the respondents stated that potential health risks posed by agricultural chemicals were a major concern on their farms. This compared to 51 percent who stated that they were very concerned about the issue nationwide and 65 percent who stated that they were very concerned about the issue in Iowa.

A part of the funding of the Integrated Farm Management Demonstration Program by the 1986 Iowa Legislature provided for an intensified educational effort in the Big Spring Basin by the Extension Service. During crop year 1987 the following activities occurred:

- * A full-time coordinator was employed by Extension Service and located in Elkader;
- * Efforts to work one-on-one with 9 farmers in the 1,125-acre Bugenhagen subbasin continued. Activities provided for these farmers included sprayer calibrating, sampling for soil tests, record keeping for crop enterprises, tillage management assisting, pest scouting and managing services, and yield measuring for evaluating alternative corn production practices;

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* Field demonstrations were established for:

- Alternative tillage management systems;
- Time and rate of nitrogen applications;
- Alternative herbicide and cultivations practices for weed control in corn;
- Alternative rates of animal manure for a nutrient source in corn production;
- Credit for alfalfa derived nitrogen in first and second year corn;
- Pest scouting and management services;
- Plugging of an abandoned well;
- Field days for local farmers to view the demonstration plots and discuss alternative practices with campus and area based specialists.

"I feel that the field day we held was successful. And, I think that the people who attended felt that it was worth their time and effort," said Albert Hanson, a Clayton County farmer who has an Alfalfa Establishment and Maintenance Demonstration on his farm.

"I think that ISU is on the right track here because there are a lot of ways to raise crops without using harsh chemicals. And, until agricultural people start looking at the soil as a living thing and not just something to make a living off of they're going to be going against nature," said Gerald Fassbinder, a Clayton County farmer.

"This is something that I'm glad to see ISU working on. But, it isn't something that can be done in a week. You need people who are dedicated to the project, and the Extension people are," said Phyllis Dettmann, a Clayton County housewife.

WHAT'S AHEAD

The demonstrations and educational activities conducted in 1987 will be continued through 1992. Additional efforts initiated in crop year 1988 included:

- * Alfalfa management activities showing seeding and establishment practices;
- * Expansion of manure demonstration plots and systematic sampling of soil water under the plots for nitrate analysis;
- * Ridge tillage demonstration with a herbicide interaction;
- * Annual surveys of land use, crop and livestock management practices;
- * Targeted soil sampling program for delivering nutrient recommendations;

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- * Economic analyses of crop and livestock production demonstrations for documentation of energy savings;
- * Employment of a halftime communications specialist.

Data from these on-farm demonstrations is being collected each year. Results will be published as reliable information over-time is obtained. Most of these on-farm demonstrations take proven Experiment Station Research and apply it under on-farm field conditions with cooperating farmers. Field Days are held at the sites to show the yearly performance of the Best Management Practices. Information Boxes are located at the field sites for those who can not attend the Field Days or want to make a followup trip to the demonstration area.

You are invited. Not all of the Demos are in the BSB. Demo sites are located in eight northeast Iowa counties. Maps locating Demos can be obtained from your local Extension Service and SCS offices, or contact me at:

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Picture Caption:

On-farm Field Demonstration are a major effort of the Big Spring Basin Demonstration Project. Shown are part of the group of 104 persons attending the July 8, 1988 Field Day in Clayton County, one of the seven Field Days held in 1988. Note Information Box at each Demo site for those who could not attend the field day, or wanted to make a followup trip to the site.

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