Judith Basin Nitrogen Project Overview

You may have first learned that researchers are studying high nitrate levels in groundwater in parts of the Judith River watershed from a survey sent out to many area farmers about 18 months ago. Or maybe a student gave you a call about accessing a stream or drinking water well on your property to collect samples. Possibly you went to the Field Day at the Central Agricultural Research Center (CARC) in Moccasin last year. Or maybe this article is the first you’ve heard of the project. Regardless, this article is meant to give you some background and an update on this project.

The United States Department of Agriculture funded this Montana State University-led project to identify the causes of high nitrate levels in shallow wells in the Judith Basin because, at high concentrations, nitrate is potentially unhealthy. The research team is working closely with local farmers and community members to learn about potential sources of nitrate and to test the effectiveness of certain agricultural practices on nitrate leaching. The project started in fall 2011 and will continue until at least fall of 2014.

The initial step that the research team took was to form a 14-member Advisory Committee (AC) consisting of several farmers, two extension agents, a county commissioner, the CARC superintendent, Natural Resources Conservation Service employees, the Montana Salinity Control Association program director, and a county health representative. The AC has helped the research team better understand perceptions concerning the nitrate issue and provided feedback on the team’s initial research approach.

A Producer Research Advisory Group (PRAG) was also formed based on recommendations from the AC and consists of six farmers from Judith Basin and Fergus counties. The PRAG has played a vital role in providing feedback on the research questions and methods and in identifying agricultural practices to test that have a reasonable chance for adoption.

We also surveyed approximately 275 farmers in the two county area in the spring of 2012, and conducted 20 in-depth interviews with local farmers. These efforts helped the team better understand local farming operations and their management practices, learn about community perspectives on the nitrate issue, and identify alternative management practices that have a high chance for adoption and could help address the nitrate issue.

The research team is working directly with the PRAG members to help answer the study’s questions, and three PRAG members are testing alternative management practices on their fields using their farm equipment. The practices currently being evaluated are: planting peas instead of fallowing, using a split nitrogen application instead of a single application, and using a slow release form of nitrogen fertilizer instead of conventional urea. These practices will be compared to conventional management practices not only for their effects on nitrate leaching, but also for their impacts on net farm revenue.

To estimate the contribution from various sources of nitrate, the research team has been regularly sampling groundwater and surface water in the watershed. In addition, soils have been sampled to almost 5 feet in 65 soil pits on the fields for nitrate and moisture. Finally, wheat and barley will be sampled to learn the effects of standard and alternative practices on grain yield and quality.

The Judith Basin Nitrogen Project is designed around the idea that local farmers and community members should be included as full partners when scientists diagnose and develop solutions to problems like high groundwater nitrate levels. The MSU team hopes this highly participatory research approach will lead to a better understanding of the local causes of high nitrate, and the development of practical solutions that are both effective and economically viable for local farmers.

If you would like more information on this project, you can go to <http://waterquality.montana.edu/docs/judith.shtml>, contact the project leader Stephanie Ewing (994-5247) from MSU’s Department of Land Resources and Environmental Sciences, or attend the CARC Field Day on July 9, 2013. If you would like your drinking water tested for nitrate, contact your county Extension agent (Chrissy Cook, Judith Basin, 566-2277; Darren Crawford, Fergus, 535-3919). It will be up to you whether your water test results will be available only to you or to the research team.