**Fallow replacement shows promise for improved drinking water quality**

**Study points to water quality benefits of fallow alternatives in the Judith River watershed**

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Replacing fallow with field pea may reduce nitrogen losses without reducing profit, providing important benefits for local drinking water supplies, according to preliminary results of a three-year study in the Judith River watershed. The results also point to potential benefits of other fallow alternatives.

The Judith River watershed has been wrestling with high nitrate levels in local well water for decades. High nitrate concentrations in drinking water can pose health risks and, if the nitrate is coming from agricultural fields, then it represents an economic loss by not feeding a crop. The USDA funded Judith River watershed nitrogen project is working with area farmers and community members to design and implement research that can help local producers find appropriate strategies to address the nitrate issue.

“Thin rocky soils and shallow groundwater in this area make nitrogen and water management particularly challenging for producers," said Adam Sigler, Extension water quality specialist in the Department of Land Resources and Environmental Sciences (LRES) at Montana State University. "We are working closely with local producers to find practical ways to manage those resources and limit nitrate losses.” Wheat growers in the area fallow about 30% of their cropland in a given year. Fallowing stores water and available nitrogen that can benefit a subsequent crop but also creates conditions that can result in nitrate loss.

The project is testing the effects of different fertilization methods (slow release, split application) and crop rotations (fallow replacement with field pea) with growers on three farms near Stanford, Moccasin and Moore. Results from two growing seasons suggest that field pea has the best chance of reducing nitrogen leaching loss without reducing profit. Generally, revenue from sale of the pea crop appears to offset any drops in subsequent wheat yield or protein levels. "Peas offer many advantages," said Clain Jones, Extension soil fertility specialist in LRES. “For example, they don’t need nitrogen fertilizer. They break up pest cycles and reduce weeds and disease.”

The study team includes two advisory groups made up of mostly Fergus and Judith Basin County residents, Extension and NRCS personnel, and researchers from Montana State University and Utah State University. “We are working with the local community to understand the bigger picture affecting sources and timing of nitrate movement through soils and groundwater in this area,” said Stephanie Ewing, LRES soil scientist. “We are looking for solutions that the community can get behind.”

For producers who have tried field pea as a fallow alternative, the possible water quality benefit complements other advantages. “I’ve been growing peas for three years and they really aren’t that challenging to work into your wheat rotation,” said Greg Grove, a Moccasin area producer and participant in the study. Grove added, “Instead of fallow, which doesn’t save much moisture in our shallow soils for the most part, one might as well have a crop growing”.

Research newsletters can be obtained at the Fergus County Extension office, the Judith Basin and Fergus County NRCS offices, local agribusinesses, and at MSU Central Agricultural Research Center. Research updates and advisory group member lists are available on-line at the project's website <http://waterquality.montana.edu/docs/judith.shtml>.