



# Water Watch

A newsletter for the Maquoketa River Watershed

## Antibiotic resistance an issue in medicine and water

*Adapted from N.H. Hall and P. Winokur, Agriculture and Environment Conference Proceedings, 2002, and Executive Summary, Iowa Concentrated Feedlot Operations Study, 2002.*

Antibiotic resistance is a health threat of great concern. Recent documents from the World Health Organization (2000), the Centers for Disease Control and other health agencies have placed a high priority on the understanding and control of antibiotic resistance.

Certain antibiotic use practices in human medicine have contributed to resistance. Agricultural antibiotic use practices also have been targeted as contributing to the problem.

A study in Iowa and 29 other states has found medicines and household substances, including at least one antibiotic, in 48 percent of the streams checked. These contaminants were found in the water after passing through treatment plants into rivers.

Ron Phillips, spokesman for the U.S. Geological Survey, the agency that conducted the sampling, said, "I think the science there is evolving. The levels here are so low.

Certainly we need to keep looking at it. It doesn't indicate that there is an emergency."

The National Institutes of Health, Centers for Disease Control and the Food and Drug Administration recently drafted a public health action plan to combat antibiotic resistance. Monitoring antibiotic resistance and improving ways to prevent the emergence and spread of bacteria resistance is receiving significant attention.

The University of Iowa Hygienic Laboratory and Department of Medicine recently identified multi-drug resistant microbes from Iowa swine, cattle and human origins. Foodborne transmission is one potential mechanism for transmission between animals and humans.

Preliminary data have identified resistant E. coli bacteria in surface water sites across Iowa. Pilot studies are needed to determine the extent and impact of drug-resistant organisms that enter the soil or water from human and animal wastes.

Agricultural subtherapeutic use of antibiotics in food producing animals has been identified by

health officials as a potential key factor in the development of resistance among foodborne pathogens.

The threat for emergence of resistant strains of bacteria through subtherapeutic use of antibiotics in livestock may be enhanced by:

- long-term use of antibiotics in animals with low-level infections,
- poor environmental conditions for animal production and
- introduction of susceptible animals or movement of carrier animals.

Over the past decade organisms isolated from animals or meat products demonstrated resistance to antibiotics, including penicillin, tetracycline, sulfamethoxazole and other compounds.

Antibiotics are critically important in human and veterinary medicine. No new classes of antibiotics will be available in the near future. Antibiotic use and strategies to improve antibiotic stewardship in human and agricultural settings will require additional research and evaluation.

# New criteria for EQIP implementation

by Gerald Miller, College of Agriculture; Larry Beeler, Natural Resources Conservation Service; and Deb Ryun, Conservation Districts of Iowa

President George W. Bush signed the Farm Security and Rural Investment Act of 2002 (the Farm Bill) on May 13, 2002. The Farm Bill introduces significant new changes to the Environmental Quality Incentive Program (EQIP). As a result, the procedures are required to be modified for the implementation of EQIP practices for the current fiscal year. However, implementation of these new changes cannot commence until the rules are finalized. The United States Department of Agriculture (USDA) has 90 days from the date of the bill signing to develop the rules for the current fiscal year. Promulgation of the rules is anticipated to occur on August 13. Funds for the current fiscal year can be released after the promulgation of the rules and must be allocated by September 30, 2002.

The purpose of EQIP, as described in the legislation, is to promote agricultural production and environmental quality as compatible goals and to optimize environmental benefits in addressing national resource priorities by doing the following:

- Assisting producers to comply with regulatory requirement concerns for soil, water, air, wildlife habitat and surface and groundwater conservation.
- Avoiding the need for further resource and regulatory programs.
- Providing flexible assistance to producers to install and maintain conservation practices that enhance soil, water, air, wildlife and related natural resources such as grazing lands and wet-

lands while sustaining production.

- Assisting producers to make beneficial, cost-effective changes to cropping systems, grazing management, nutrient management associated with livestock, pest or irrigation management or other practices on agricultural land.
- Consolidating and streamlining conservation planning and regulatory compliance.

The guidance in the Farm Bill for EQIP indicates that priority is to be assigned to applications that encourage the use of the most cost-effective practices that address the previous list of priorities and optimize environmental benefits. A major change from the previous EQIP is that priority geographic areas or projects defined on a watershed basis are no longer required. Other changes include the following:

- Cost-share rates are authorized up to 75 percent with 90 percent for limited resource or beginning farmers.
- Cost-share is available the first year of the contract.
- The minimum contract length can be one year past the date of installation of the last approved practice in the contract.
- The payment limitation per producer is \$450,000 for the period authorized in the Farm Bill. This title of the Farm Bill is scheduled to expire in 2007.
- The program requires that nationally 60 percent of the funds allocated are to be spent on livestock related practices, representing an increase of 10 percent from the previous program.
- The 1,000 animal unit limitation has been removed for animal

waste storage structures.

- A comprehensive nutrient management plan (CNMP) is required to be developed and implemented when a producer receives assistance for an animal waste management system.

To implement the guiding principles defined in the purpose of EQIP, Iowa Natural Resources Conservation Service (NRCS) staff convened a subcommittee that represents a cross section of the nearly 40 organizations, agencies and institutions that form the NRCS State Technical Committee. These representatives developed an EQIP evaluation worksheet to score applications submitted for fiscal year 2002 (FY02) funding and to prioritize the applications for funding. This worksheet was presented to the State Technical Committee on June 13 and approved by the full committee.

The worksheet assigns points in five major categories: 1) legislative criteria, 2) livestock criteria, 3) water quality measures, 4) soil quality planning and 5) wildlife habitat establishment or improvement. The greatest number of points can be accumulated for applications that address any one or a combination of these criteria, measures and practices. For example, in the legislative category points will be awarded for land tracts that are located in an impaired watershed [EPA section 303(d) list] or in a watershed that outlets directly into an impaired water body. Also, points will be awarded if the application is for a livestock manure storage system to treat a high risk situation as evaluated by the Iowa Environmental Priority Assessment for Open Feedlot program. In the

*continued next page*

## New criteria, cont.

category of livestock criteria, points will be awarded for those applications that address an existing animal manure concern or replacement of an existing facility. Fewer points would be assigned for expanding an existing facility or constructing a new facility. In the soil quality category, points will be allocated for implementation of a resource management system.

In addition, the State Technical

Committee agreed that applications for FY02 funding will be submitted to the state level and evaluated using the EQIP evaluation worksheet. The justification for centralizing the evaluation of applications for this year is because of the short period of time, less than 45 days, that will be available to allocate funds and because Iowa will be positioned to participate as a recipient of funds that are redistributed nationally by NRCS before Sept. 30, 2002. It is anticipated that the rules and implemen-

tation procedures for evaluating applications will be reviewed after Oct. 1, 2002, for allocation of FY03 EQIP funds.

Applications for FY02 EQIP funding are to be submitted at the local soil and water conservation district office. Producers are encouraged to contact their local NRCS office staff to discuss the details of the application process and to review the worksheet that will be used to evaluate applications.

## Swine, poultry, dairy feeding changes to protect environment

*by John Rodecap, Iowa State University Extension coordinator, Maquoketa Watershed Project*

Refined feeding strategies, feed additives and new plant genetics are offering livestock and poultry producers opportunities to reduce the impact of manure on the environment while maintaining profitability. Rations were often formulated to meet nutrient requirements without concern about the quantities of nutrients excreted and over-supplemented. Phosphorus is the nutrient in manure that determines the amount of land required for manure application to be in balance with nutrient uptake by crops.

Phosphorus excretion from swine can be altered by avoiding overformulation of rations, phase and split sex feeding, use of the phytase enzyme and feeding low phytate corn.

Most of the phosphorus in grains is present in a form called phytate phosphorus. Single stomach animals are unable to break down the phytate molecule, thus phosphorus is only 14 percent available in corn, 25 percent in soybean meal and 50 percent in wheat. The

unavailable phytate phosphorus is excreted and becomes a stress on the environment, especially if applied to high phosphorus testing soils. Phytase is an enzyme that when added to the ration breaks down the phytate molecule, making the grain phosphorus more available to swine and poultry.

When phytase is added to a ration and if over-formulation of phosphorus supplements are appropriately reduced, it is estimated by ISU scientists that phosphorus excretion from finishing swine can be reduced by 54 percent (27 percent from refined ration formulation and 27 percent due to phytase).

Depending on supplies of phytase, the ration may cost \$1 more per ton of feed.

Genetically modified corn has been developed that contains low levels of phytate phosphorus. A Kentucky study comparing normal and low phytate corn found total phosphorus to be slightly higher in the low phytate corn and available phosphorus four times that of normal corn.

The manure phosphorus distribution in acres required for a 100-sow

farrow-to-finish operation producing 150 bushel per acre corn would be 194 acres using the previous phosphorus supplementation practices and only 89 acres if there is a 54 percent reduction in manure phosphorus. At 200 bushel per acre corn yields the acreage required is 145 and 67 acres respectively.

A recent survey of dairy producers in Wisconsin indicates more than one-half of its cows are fed excess levels of phosphorus. If dietary phosphorus is lowered from 0.55 percent to the maximum dietary phosphorus level recommended by the National Research Council, the land area needed to spread manure from 100 cows to meet crop production needs changes from 290 acres to 180 acres according to University of Wisconsin calculations.

In addition to reducing the acres required for manure application, a much more desirable balance of nitrogen and phosphorus for crop production is possible when phosphorus is reduced by 50 percent in the excreted manure. The balance is dependent on potential nitrogen losses caused by manure handling and lack of timely manure incorporation.

## Adding value to woodlands

Corey Fairly has a vision that includes trees and their harvest. Corey is doing Timber Stand Improvement (TSI) on 70 acres of woodland on his grandmother's farm northeast of Onslow in the Mineral Creek Watershed.

TSI includes eliminating less desirable trees to make room for the more desirable trees to increase timber quality, quantity and value.

Unmanaged woodlands can be improved with TSI practices during forest development. Removal of trees that compete with

desirable hardwood trees is called weeding or thinning. Removal of trees that overtop desirable seedlings or saplings is called release cutting.

Pruning is recommended for only the most valuable trees, such as oak or walnut. Pruning increases the yield of knot-free, high grade lumber or veneer. Young potential crop trees (not more than 75 to 100 per acre) are pruned just before the growing season begins and before buds begin to swell.

A healthy productive woodlot will maintain ground cover to reduce

soil erosion, improve water quality, provide wildlife habitat, add to farm income and add attractiveness to the landscape.

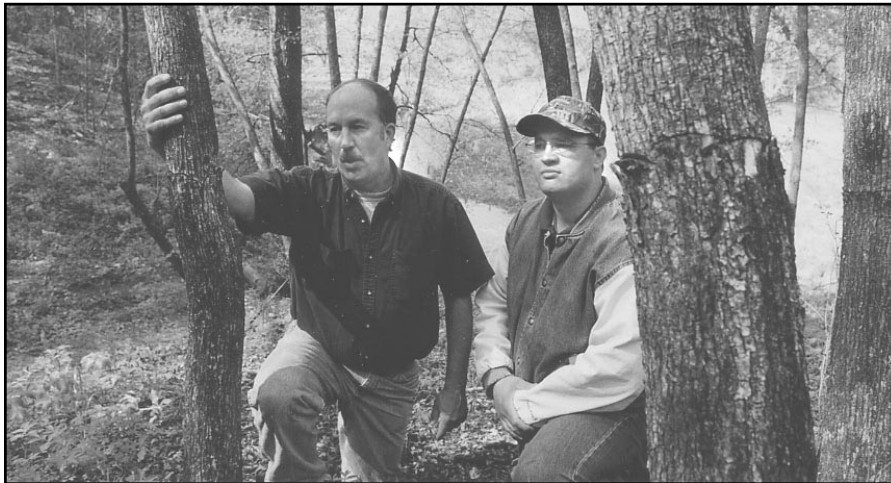
For assistance with woodland evaluation and TSI recommendations, contact the Iowa Department of Natural Resources district foresters directly or through staff at the county ISU Extension service or Natural Resources and Conservation Service.

---

**Water Watch** is published bimonthly and funded, in part, by the USDA CSREES project number 00-51130-9731, the Iowa Department of Natural Resources through a grant from the U.S. Environmental Protection Agency under the Federal Nonpoint Source Management Program (Section 319 of the Clean Water Act) and Iowa State University Extension. The newsletter is free to project participants and those interested in issues involving farming methods and their effects on groundwater quality. Subscribe by sending your address to **Water Watch**, Box 487, Fayette, IA 52142. Charles Wittman, editor.  
E-mail: [cwittman@iastate.edu](mailto:cwittman@iastate.edu); Web site: <http://extension.agron.iastate.edu/waterquality/>

---

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, gender, religion, age, disability, political beliefs, sexual orientation, or marital or family status. (Not all prohibited bases apply to all programs.) Many materials can be made available in alternative formats for ADA clients. To file a complaint of discrimination, write USDA, Office of Civil Rights, Room 326-W, Whitten Building, 14th and Independence Ave., SW, Washington, DC 20250-9419 or call 202-720-5964.



Corey Fairly, right, and Mineral Creek Watershed Project environmental specialist Darcy Keil discuss the success of the tree girdling done last winter.