



Water Watch

A newsletter for the Maquoketa River Watershed

Manure, nutrient planning pays for small farms

by Chad Ingels, nutrient and manure management specialist, MWP

Public awareness of nitrogen (N) and phosphorus (P) and how they affect water quality continues to increase, especially with the growing number of large livestock operations. However, a significant number of livestock farms are still considered small animal feeding operations (up to 267 dairy cows, 1,333 market hogs or 640 feeder cattle) by the Iowa Legislature, and these operations are not subject to writing manure management plans and the resulting regulations.

Information from the Iowa Statistics Service shows that in 1998, the average dairy farm in Fayette County and Clayton County had 67 and 58 cows, respectively. The smaller farms are not required to produce detailed manure management plans. Each year, a 75-cow milking herd and replacements produce approximately 2,500 tons of manure containing 30,000 pounds of N and 15,000 pounds of P. As producers of a nutrient rich by-product, small livestock operations need to manage on-farm nutrients in an environmentally and economically sound manner.

With spreader calibration and a

nutrient management plan, an economic analysis can be established for manure produced on an average 75-cow dairy herd in northeastern Iowa. A typical dairy herd produces 32.77 tons of solid manure per milk cow per year. (See Iowa State University Extension publication Pm 1811, Managing manure nutrients for crop production.) The 75 cows and replacements create 2,458 tons of manure per year. For this example, assume that manure (85 percent) is collected and surface-applied on the available cropland. The 2,089 tons of manure to be spread has an analysis of 12-6-12 (N-P-K [potassium]), and 70 percent of the N will be available to the crop after in-field volatilization. (See Pm 1811.) If 50 percent of the N will be available to the crop the first year, there will be 8,774 pounds of N; 12,534 pounds of P; and 25,068 pounds of K credited for crop use if soils are testing in the optimum range or lower.

The farm in this example will produce 150 bushels of corn and 50 bushels of beans per acre in a corn-bean rotation. There are 130 acres of corn per year following soybeans. A credit of 50 pounds N per acre is used in the crop rotation. To

supply the rest of the required N needs, the farmer typically applies N as anhydrous ammonia (NH₃) and has the local cooperative spread a crop removal rate of potash and phosphate following beans. The total commercial N applied is 120 pounds per acre.

When developing a manure management plan, there are two different methods to determine the desired application rate. The first, and most widely used, method is to apply manure based on the desired N rate for the crop. The second method is to apply manure at the crop removal rate of P. This latter method may be required in the future for manure management planning. The economic benefit of each method can be compared in the table on page 2.

Commercial N for the crop is from two sources: 102 units are from the anhydrous application at \$0.14 per unit, and 18 units are from the plowdown fertilizer at \$0.20 per unit. The unit rates for the P and K are \$0.211 and \$0.137, respectively. Planning for application at the N rate would require spreading manure on 73 acres (120 pounds N per acre) and commercial fertilizer

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Manure cont.

on 57 acres each year. The costs associated with manure hauling are not included because it would be hauled to some fields anyway.

Applying manure at 28.6 tons per acre would provide the nutrients for this scenario. Results from Northeast Iowa Demonstration Project spreader calibrations show the average 280-bushel spreader applies 21.4 tons per acre. A nutrient management plan with the N rate application of manure would save \$4,528.19 per year in input costs compared with the current plan where no manure credits are taken.

Using the P rate for manure application would require 130 acres each year. Fifty-five units of N per acre would need to be purchased under this plan; however, the P and K would not be overapplied and would maintain the soil test values.

Nutrient management plan for 130 acres of corn following soybeans ¹

	Current plan	Rate of manure application	
	(no manure credit)	N rate	P rate
	\$/acre	\$/acre	\$/acre
Nitrogen	\$17.88	\$17.88	\$7.70
Phosphate	\$19.41	\$19.41	0
Potash	\$16.44	\$16.44	0
NH ₃ application ²	\$ 6.30	\$ 6.30	\$6.30
Crop removal appl. ¹	\$ 2.00	\$ 2.00	0
Cost per acre	\$62.03 x 130	\$62.03 x 57	\$14.00 x 130
Total fertilizer cost	\$8,063.90	\$3,535.71	\$1,820.00

¹Nutrient prices and spreader rate supplied by a northeastern Iowa fertilizer supplier. ²Iowa State University Custom Rate Survey.

The use of the P rate plan would result in spreading manure at a rate of 16 tons per acre. Profit would be increased by \$6,243.90 per year when using the manure at the P rate application. This is an increase of \$1,715.71 above the savings with the N rate plan.

To feel comfortable with taking manure credits, it is essential to calibrate the spreader to achieve the desired application rate of

nutrients. With proper calibration, it is easy to acknowledge the nutrient credits that are available and apply the cost savings directly to the farm's bottom line.

For more information about this topic and the nutrient demonstrations in the watershed, call the Maquoketa Watershed Project staff at (319) 425-3233. Staff are also available to help producers calibrate their manure spreaders.

Volunteers monitoring Maquoketa and its tributaries

by Charles Wittman, MWP
communication specialist

It's a monthly sight in the Maquoketa headwaters watershed. Bob Bassett or Joe Wingert wade

into the waters of local streams looking at conditions and taking measurements, accompanied by a few helpers.

In May, the two members of the

watershed council completed a two-day IOWATER training workshop for volunteers. Following discussions on which sites to monitor, they started taking samples at 13 sites in the watershed area.

One aspect of IOWATER is to involve others, so Bassett and Wingert have called on other members of the community to help. Eight volunteers, including two students, have gone out with them on their monitoring trips.

Monitoring at each site follows IOWATER guidelines. They measure the stream width, take its temperature, look for macroinvertebrates (tiny creatures like the mayfly) that indicate the stream's health, check the clarity of the

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Brad Chambers, left, and Joe Sanfilippo, right, help Bob Bassett make his IOWATER observations in late June on Fenchel Creek, a Maquoketa River tributary in Backbone State Park.

Volunteers cont.

water and make a visual assessment of the habitat, and test for nitrates, pH and phosphorus, constantly writing their findings on a three-page data sheet.

At the June meeting of the headwaters watershed citizen council, they discussed their first efforts.

"It takes a little more time than most people realize," said Wingert – about 30 minutes per site.

"I appreciated all the help," said Bassett, referring to the volunteers who've made the stream trips with him. In late June, Joe Sanfilippo of Backbone Friends and Brad Chambers of the Strawberry Point water department helped Bassett monitor sites on Fenchel Creek on

the Maquoketa River near Richmond Spring in Backbone Park and a site just south of Strawberry Point. As he made his observations, Bassett explained the process to the two volunteers.

Later the data they collected were entered into an on-line database managed by the Geological Survey Bureau, Iowa Department of Natural Resources. Each site was given an identification number and position location using on-line topographic maps.

These and other data collected by IOWATER volunteers statewide will provide both a benchmark and continuing look at water quality in the state. The information is available to the public and will give watershed residents a better

understanding of the environmental health of the watershed.

The headwaters isn't the only part of the Maquoketa watershed where IOWATER volunteers are working. Four volunteers have attended IOWATER training and are monitoring at various locations in the Mineral Creek watershed. Another six people will attend IOWATER workshops this month.

Mineral Creek is a 31,425-acre watershed, originating near Amber and Edinburg in Jones County and delivering its water to the Maquoketa in Jackson County.

Citizen volunteers are monitoring several locations in Lake Delhi, three tributaries, and at the Highway 20 USGS gaging station.

Walk-in fishery benefits water quality as well as anglers

by Joe Wilkinson, IDNR information specialist

Through the summer, Kevin and Doug Baumgartner pasture 50 cow-calf pairs on 100 rented acres along the Maquoketa River southwest of Strawberry Point. For one mile the banks are fenced off and cattle are permitted to "flash graze" along the stream twice a year. Gravel crossings and sodded banks provide a buffer between agricultural and recreational uses on the coldwater (trout stream) segment of the Maquoketa River.

This buffer pays big dividends by reducing siltation. "Siltation destroys spawning habitat. Trout are less tolerant of chemicals than most fish, especially ammonia. They also require higher oxygen levels in the water," explains Dave Marolf, Manchester hatchery manager for the Iowa Department of Natural Resources (IDNR).

Stockings along the pasture area are unannounced. And the pre-

dominant species, brown trout, acclimate quickly. They survive on insect hatches and other natural foods.

These walk-in streams provide a special challenge for trout anglers. The unique landowner-IDNR relationship has worked well for 20 years and yields cleaner water downstream.

"The IDNR came to the landowners and us and proposed (the habitat work)," recalls Kevin Baumgartner. With an offer to supply materials and labor for habitat work, it was not a hard agreement to reach, even with the provision that the public be allowed to 'walk in' and fish.

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Keith Baumgartner, right, and sons Kevin and Doug, left and center, at their walk-in fishery on the Maquoketa River southwest of Strawberry Point. Keith is the "fisherman and fencer" of the group, say his sons.

Walk in fishery cont.

"I was a little bit (cautious)," admits Baumgartner, who provides the labor to maintain the area. "Not really, though. We all grew up fishing and hunting. It's fun to see kids walk out with trout."

The walk-in agreement applies to streams stocked with catchable sized trout. Many are listed among the 'Catchable and Special Trout Streams' in the IDNR's Trout Guide, available at IDNR fisheries offices.

"It is a very informal, verbal agreement. Either side can stop the agreement at any time. If the landowners notify us, we'll stop stocking tomorrow," says IDNR

Maquoketa River projects update

Lake Delhi Appreciation Week was held July 1-8. On the last day, 200 people attended the Lake Delhi Festival, which had the theme of water quality.

Four Mineral Creek watershed residents received IOWATER training and six more are scheduled for training in August. The council is developing a water quality monitoring plan for the

district fisheries supervisor Dave Moeller.

More restrictive areas are stocked with fingerlings once a year. Here, anglers step into a different environment...catching trout that have survived and grown in the wild. They also must get permission from the landowners in these 'put and grow' streams.

When a valuable stretch of stream is identified, habitat improvements can be close behind. The IDNR, often with volunteer help from the Hawkeye Fly Fishing Association, can provide bank hide installation, stream stabilization and other habitat work. Last year 16 volunteers helped repair flood damage, recalls Keith, Kevin's father.

entire watershed. In July, the Jones County SWCD applied for an Americorps person to serve as Interim Project Coordinator for the Mineral Creek Water Quality Project.

Maquoketa Headwaters Project held a tour of conservation practices and demonstration sites on July 20. Approximately 60 people were on the nine-stop tour.

Landowners with an interest in stream protection and restoration of native trout can contact the IDNR management biologist at Decorah, phone (319) 382-8324, or Manchester, phone (319) 927-3276.

"We work with a variety of projects. We can provide technical assistance, and perhaps some mix of cost-share dollars for improvements and bank stabilization," says Moeller. "It really does work well. The landowner has control."

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