

**Maquoketa Watershed Project
2003 Nutrient Management Field Demonstrations**

The following measurements will be collected at each cooperating field demonstration locations: corn yield, late spring soil NO₃-N, visual leaf assessments, end-of-season cornstalk NO₃-N and pre- and post-season P soil test.

This is the fourth consecutive year of nitrogen management demonstrations in the Maquoketa watershed. Nutrient management demonstrations will also be initiated in Mud Creek watershed (southeast Iowa) for 2003.

Headings are color coded to the legend on the Headwaters demonstration sites map.

Corn following soybean: [Replicated small-plot Nitrogen rate comparisons](#)

- 4 producers will demonstrate six rates of N application: 0, 30, 60, 90, 120 and 150 lbs N/acre.
- 3 producers will demonstrate six rates of N application 0, 40, 80, 120, 160 and 200 lbs N/acre in conjunction with a statewide Iowa State University nitrogen and carbon field study. This project is part of the Iowa Department of Agriculture Integrated Farm and Livestock Management Demonstration Program. Multiple-depth soil N tests will be collected at these sites.
- 2 producers will compare pre-plant only, split application and side-dress only application of commercial N. Six nitrogen rates were applied at/prior to planting for the pre-plant N application. The split application treatments will include the application of 60 lbs N/acre at/prior to planting with the addition of side-dress N to have total applications of 60, 90 and 120 lbs N/acre. The side-dress only treatments will receive 60, 90 and 120 lbs N/acre.

Corn following soybean: [Replicated small-plot Phosphorus rate comparisons](#)

- 7 producers will compare the application of three rates of commercial phosphorus fertilizer. Phosphorus treatments of 0, 46 (one year crop removal) and 92 (two year crop removal) lbs P/acre will be applied where 120 lbs N/acre is the base N rate. Pre- and post-season soil P tests will be collected.
- Past soil tests have shown that nearly ninety percent of fields within the demonstration project test high or very high (>20 parts per million) for soil P. Application of P to these soils would not provide a reliable crop yield response.

Corn following soybean: [Field-scale Nitrogen rate comparisons](#)

- 3 producers will demonstrate the side-dress application of N within field-width strip trials. Two of the producers applied a portion of the N (60 lbs N/acre) pre-plant and will supplement with additional N to meet the corn crop needs. N rates to be compared will be 0, 60, 90, 120 and 150 lbs N/acre. Trials will be harvested with the producers GPS, yield monitor-equipped combines to measure yield.
- The Iowa Corn Growers Association is sponsoring the field-scale nitrogen and manure management demonstrations.

Second-year corn: [Field-scale Nitrogen rate comparisons](#)

- These demonstrations are a continuation of a field-scale N study conducted on 10 NE Iowa farms in 2002.
- 1 producer will evaluate the application of five rates of N on second-year corn in the same field where five rates of N were applied to corn following soybean the

previous year. The resulting treatments will allow for comparison of 14 different two-year N application sequences.

- 1 producer side-dressed two rates of N to second-year corn where 60 lbs N was applied to a corn following soybean field in 2002.
- 2 producers applied a single rate of N for second-year corn in the same field where five different N rates were compared in 2002. These demonstrations will evaluate the second-year impact of reduced N rates for corn following soybean.

Manure Management: Replicated small-plot Manure/Nitrogen management demonstrations

- 4 producers will host six demonstrations to compare the use of the manure with/without the supplementation of commercial N for corn production. Four demonstrations will be on corn following soybean and two demonstrations will be conducted on second-year corn.
- Treatments at these demonstrations will include: zero N/no manure, manure only, manure plus 50 N, manure plus 100 N, 100/150 N and manure N rate (commercial N applied at the first-year manure N credit rate).
- Three of the demonstrations will use fall-applied swine manure into bean stubble for CY2003 corn. Individual rates were 2500, 3500 and 4500 gallons per acre.
- Two of the demonstrations will use spring-applied swine manure into no-till cornstalks. Second-year corn will be grown no-till in these situations.
- One producer will demonstrate the use of fall-applied poultry manure from an egg production facility. No-till corn will be grown in this corn following soybean demonstration field.

Manure Management: Replicated small-plot Manure/Phosphorus management demonstrations

- 3 producers will host demonstrations to evaluate the use of manure with/without the addition of commercial phosphorus. Four of the demonstrations will use swine manure and one demonstration will use poultry manure.
- Treatments will include manure, manure plus 46 P, 100/150 N, N plus 46 P and N plus manure P rate (commercial P applied at the manure P credit rate). Corn yield and pre- and post-season soil P test will be evaluated at all demonstration sites.
- One demonstration will be conducted in a corn following soybean field using fall-applied swine manure. In addition, the impact on soil test P from manure application will be measured where manure rates are 2500, 3500, 4500 and 5500 gallons per acre.
- One demonstration will be conducted in second-year, no-till corn using spring-applied swine manure. Also, the impact on soil test P from manure application will be measured where manure rates are 3000, 4500 and 6000 gallons per acre.
- One demonstration will be conducted in no-till corn following soybean using fall applied poultry litter.

Manure Management: Replicated field-scale Swine Manure management demonstrations

- Two producers will demonstrate the use of swine manure for corn production at replicated, multiple rates in field-width strip trials. A check strip with no manure or N application is included at each location. Producers will harvest the corn with GPS-equipped combines and computer software will be used to determine the yield impact of the manure across soil types.

- One site will compare fall-applied swine manure applied at 2500, 3500, 4500 and 5500 gallons per acre to soybean stubble. The manure used at this location tested 69.7-42.8-39.8 for N-P-K. The first-year N-P-K applied at each rate is:

<u>Rate gal/a</u>	<u>N</u>	<u>P</u>	<u>K</u>
2500	137	107	100
3500	190	150	139
4500	246	193	179
5500	300	235	219

- A site will compare spring-applied swine manure applied at 3000, 4500 and 6000 gallons per acre to standing cornstalks. This field will be second-year, no-till corn. The manure used at this site tested 67.4-39.9-39.8 for N-P-K. The first-year N-P-K applied at each rate is:

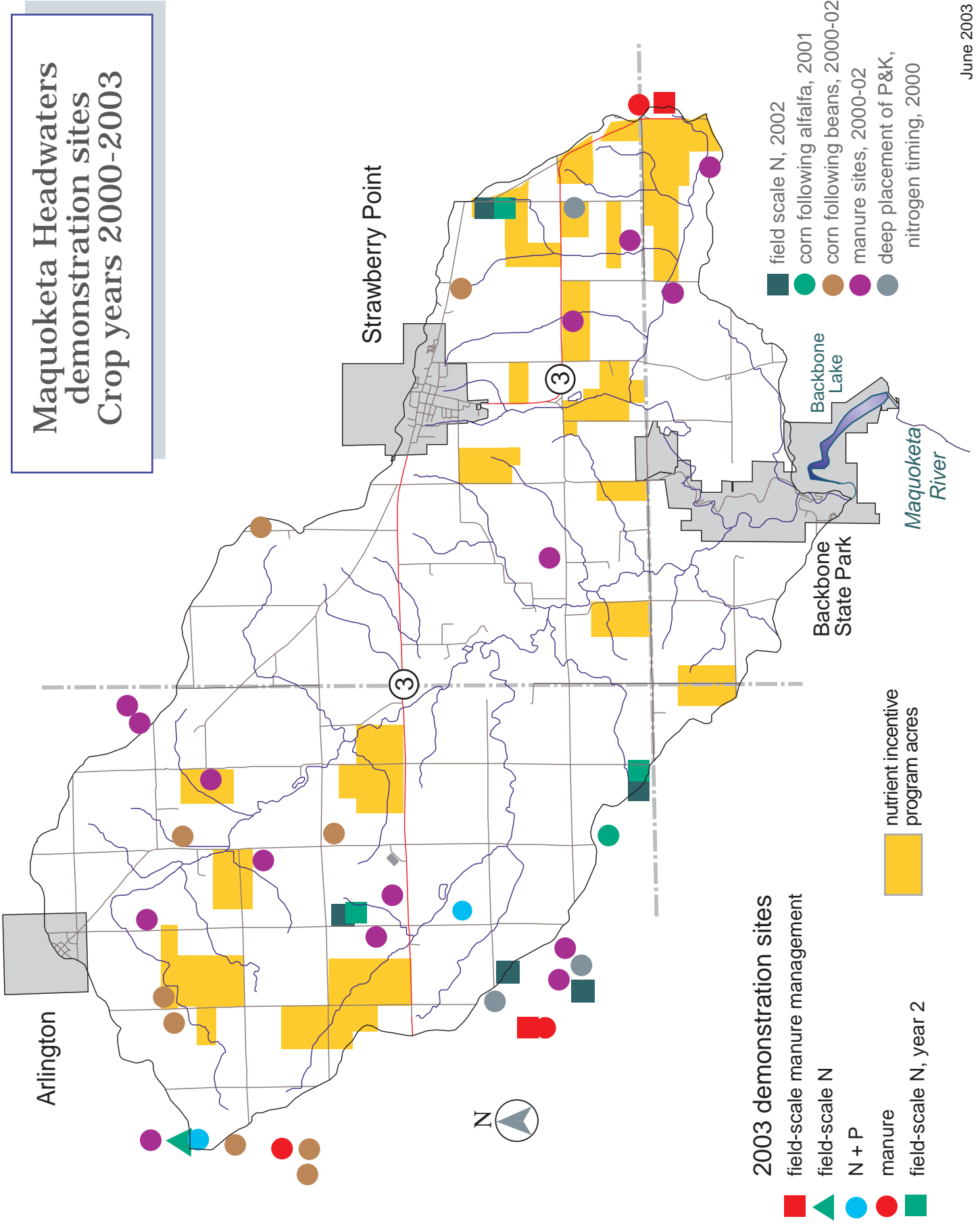
<u>Rate gal/a</u>	<u>N</u>	<u>P</u>	<u>K</u>
3000	158	120	119
4500	238	180	179
6000	317	239	239

Manure Management: [Replicated field-scale Dairy Manure management demonstrations](#)

- One producer will demonstrate the application of dairy manure at three rates in the Mud Creek watershed. The manure application rates at this location will be 5800, 8000 and 10,700 gallons per acre. A zero check will also be included in the corn following soybean field. Additional treatments will include the application of 50 lbs N/acre to the 5800 and 8000 gallons per acre manure rates and 135 N/acre applied as anhydrous ammonia. The first-year N-P-K applied at each rate is:

<u>Rate gal/a</u>	<u>N</u>	<u>P</u>	<u>K</u>
5800	107	56	136
8000	147	81	187
10,700	198	108	250

Maquoketa Headwaters demonstration sites Crop years 2000-2003



- 2003 demonstration sites**
- field-scale manure management
 - ▲ field-scale N
 - N + P
 - manure
 - field-scale N, year 2

- field scale N, 2002
- corn following alfalfa, 2001
- corn following beans, 2000-02
- manure sites, 2000-02
- deep placement of P&K, nitrogen timing, 2000

■ nutrient incentive program acres