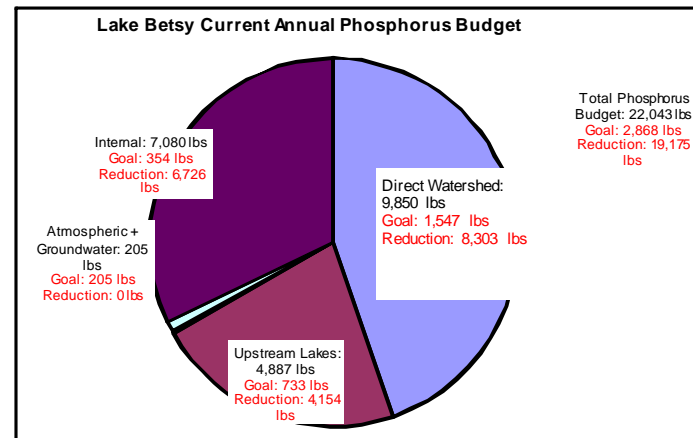


Clearwater River Watershed District –Lake Betsy TMDL



As shown in the chart on the left, the Lake Betsy TMDL calls for significant phosphorus reductions in watershed runoff and internal loading to meet TMDL goals.

A reduction of 8,303 lbs of phosphorus is needed from the direct watershed.

The variable-rate fertilizer application program, if applied over the entire Lake Betsy watershed, could yield a potential phosphorus reduction of 1,200 to 4,800 lbs, which would be a significant portion of the required load reduction.

A reduction in the phosphorus load in the Lake Betsy watershed would also benefit the Clearwater River and other downstream lakes in the CRWD.

Other Programs Available

NRCS Nutrient Management Initiative Program

This program, available to farmers in Minnesota, provides a framework to evaluate their own nutrient management practices compared with nutrient rate guidance promoted by the USDA-NRCS. Farmers receive \$1,200 for providing data and completing the program requirements.

Funding for the program is through the Environmental Quality Incentives Program (EQIP) and administered by the MN NRCS.

Buffer Incentives

The Clearwater River Watershed District offers incentives to farmers for planting and maintaining buffers adjacent to ditches and tile inlets in sensitive areas.

Contact the CRWD for more information.

Program Contacts

Clearwater River Watershed District
Dennis Loewen, Assistant Administrator
Phone: (320) 274-3935
Email: loewen.dennis@yahoo.com

Litchfield Cenex Consumers Co-Op Association
Craig Bulau
Phone: (320) 693-6014
Email: craigb_74@hotmail.com

Meeker County NRCS/SWCD
Joe Norman
Phone: (320) 693-7287
Email: joenorman242@yahoo.com

Stearns County NRCS/SWCD
Mark Lefebvre
(320) 251-7800
Email: mark.lefebvre@mn.nacdn.net

Wright County NRCS/SWCD
Julie Reberg
(763) 682-1970
Email: julie.reberg@mn.usda.gov

Did You Know?

- Parts of three counties make up the CRWD: northeastern Meeker County, southeastern Stearns County, and northern Wright County.
- The CRWD covers 159 square miles and includes 7,336 acres of lake basins contained mostly in 19 lakes.
- The headwaters of the Clearwater River are in Meeker County. From its headwaters the river flows east-northeast until it meets the Mississippi River at the City of Clearwater. The river is approximately 39 miles long.



April 2011

Area Growers Launch Nutrient Management Program

Results Indicate Reduction of Fertilizer Rates and Phosphorus Runoff

Overview

In 2010 the Clearwater River Watershed District (CRWD), in cooperation with the Litchfield Cenex Consumers Co-Op and other partners, began a program to demonstrate the feasibility and utility of systematic soil testing in reducing fertilizer application and thus phosphorus load in agricultural runoff.

Soil fertilizers are used throughout the watershed and usually are applied at a standard rate, even though soil nutrient levels, soil type, and pH may vary significantly across a parcel. Soil was tested on a grid in each of 20 parcels to determine the proper amount of fertilizer to be applied to each section of the parcels. The applicators used the results of the soil tests and GPS technology to apply the precise amount of fertilizer needed in each grid section.



In the first year of the nutrient management program, targeted application of fertilizer was found to reduce rates of application and save money. Reduced phosphorus runoff also is expected.

Agricultural runoff is a significant source of nutrients to the Clearwater River and impaired lakes in the watershed. Nutrient Total Maximum Daily Loads (TMDLs) completed for 11 impaired lakes in the Clearwater River Watershed District (CRWD) identified the need to reduce phosphorus load from agricultural sources by 80% to meet state standards.

Goals

The goal of this program is a 10% reduction in fertilizer application rates on selected priority cropland in the portion of the watershed tributary to Clear Lake and Lake Betsy. This reduction in fertilizer application rate will result in a significant reduction of the annual phosphorus load to Clear Lake, Lake Betsy, and downstream water bodies. It is estimated that the program could potentially translate into a 10%-50% reduction in phosphorus runoff from the watershed.

Evaluation

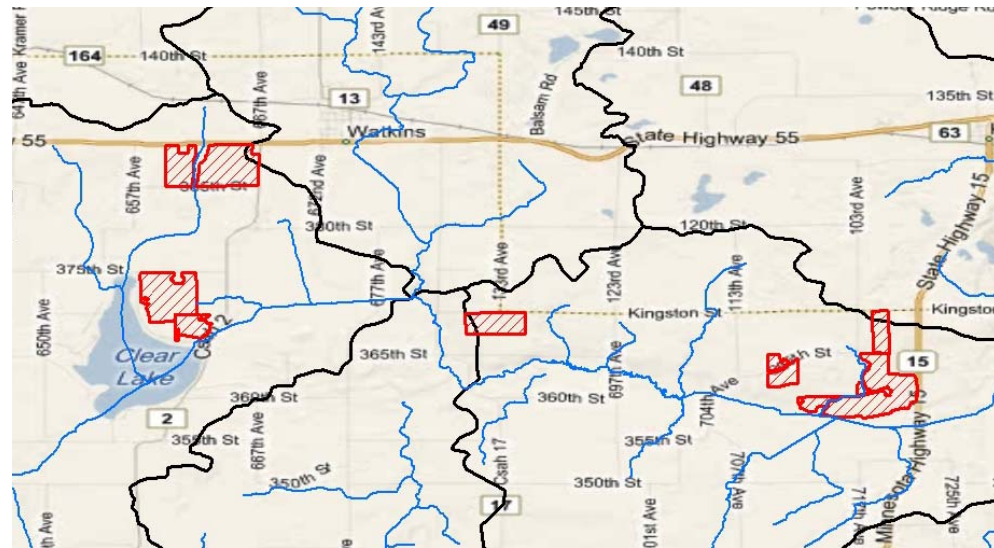
To evaluate the effectiveness of this program, the CRWD plans to conduct monitoring at drain tile outlets in fields participating in the program as well as at drain tile outlets in fields receiving fertilizer at standard application rates. The data will be analyzed to determine the connection between fertilizer application, soil phosphorus concentration, field sensitivity, and runoff concentration.

Inside:

Program Details (page 2)
Typical Results (page 3)
Who to Contact, Other Programs (back page)

Program Details

2010 Selected Properties



Twenty parcels, outlined above in red, participated in the nutrient management program in 2010.

Program Benefits:

- Reduced application rates and reduced cost of fertilizer (see examples on next page).
- Less phosphorus to run off.
- Improved water quality.

Process

Property Selection

The CRWD identified priority croplands within the watershed based on their proximity to water bodies, slope and soil type. Litchfield Cenex Co-Op then invited landowners in these areas to participate in the program and evaluated and selected fields for the study.

Soil Testing

Soil sampling grids were set up based on field size. Fields larger than 20 acres were sampled on a 2.2-acre grid while fields smaller than 20 acres were sampled every 2 acres or in at least 10 locations. A soil sample was collected at each point on the sampling grid, and samples were analyzed for phosphorus, potassium, zinc, sulfur, pH, and organic matter.

Fertilizer Application

Based on the results of the soil tests at each point, an application rate was determined for each type of fertilizer to be applied. GPS technology was used by the fertilizer applicator to apply fertilizer at the correct rate in each grid in the crop field.

Phosphorus and Agricultural Runoff

Phosphorus enters lakes and streams either as soluble (dissolved) phosphorus or in particulate form attached to soil particles in runoff.

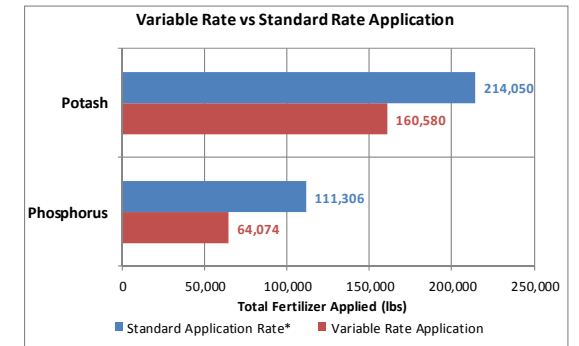
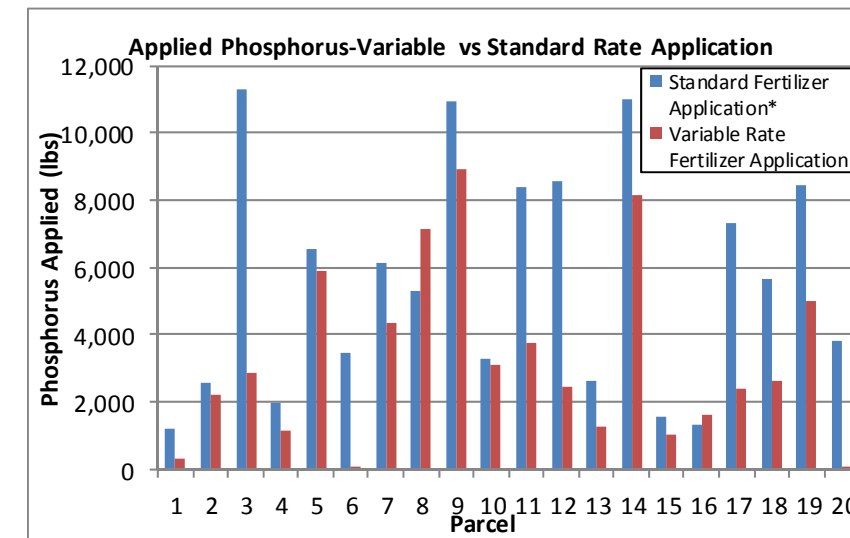
The ideal range of phosphorus for crop uptake in agricultural fields is 25-30 ppm. Past soil tests have shown that phosphorus concentrations in the watershed often are in the range of 35-45 ppm and may be as high as 200 ppm in over-fertilized soils.

Once soil phosphorus levels exceed concentrations needed for crop uptake, additional applications of fertilizer will not provide any benefit to the crops and will increase the potential for phosphorus runoff.

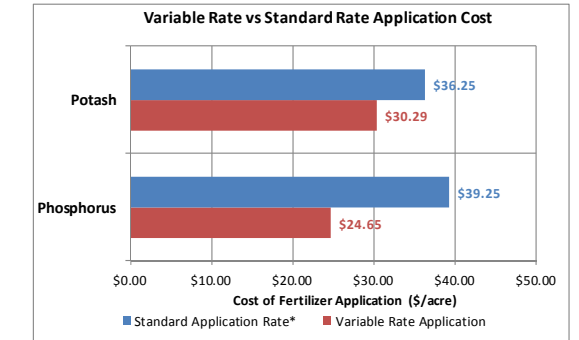
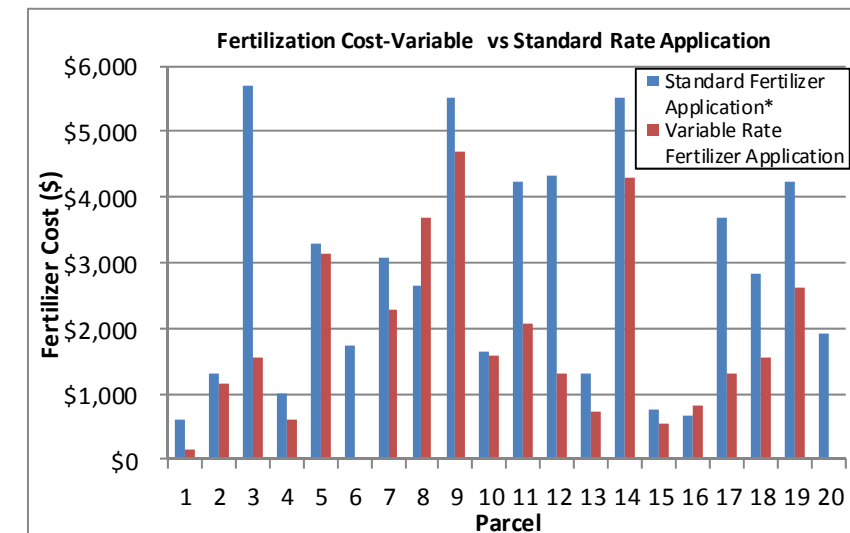
More Participants Needed

CRWD is looking for more participants for this program. For more information, call Dennis Loewen, Assistant Administrator, at 320-274-3935.

Typical Results



Data from 2010 indicates that the variable-rate fertilizer application resulted in a 42% reduction in applied phosphorus and a 25% reduction in applied potash when compared to standard-rate application.



Data from 2010 indicates that the variable-rate fertilizer application resulted in an average cost savings of \$14.60 per acre for phosphorus fertilizer and \$5.96 per acre for potash.

*Note: Standard Fertilizer Application rates assumed to be 150 lbs/acre for mono ammonium phosphate and potash.

What Does It Mean?

Analysis of 2010 results indicates that the use of GPS soil testing and variable-rate fertilizer application reduced application rates and costs and results in less excess phosphorus available for runoff.

The application of this program on 1,427 acres in the watershed tributary to Lake Betsy resulted in a reduction of approximately 50,000 pounds of excess phosphorus fertilizer applied on the watershed. If applied over the approximately 21,000 acres of land in row crop production in the entire watershed to Lake Betsy, the use of variable-rate fertilizer application potentially could reduce the amount of phosphorus fertilizer applied in the watershed by approximately 700,000 lbs.