

THE BMP CHALLENGE

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BMP CHALLENGE Available in New States

New! The BMP CHALLENGE is now available in **Idaho** and **Missouri!**

If you grow corn for grain or silage in any of the states listed below you are eligible:
IA, ID, IL, IN, MN, MI, OH, PA, MO, NC, NE, FL, MD, DE, or WI

Sweet corn, popcorn or corn planted for wildlife are not eligible. Participants must be eligible for EQIP.

In This Issue

BMP Challenge 2008 Corn Prices Set

Guaranteeing Net Returns Eases BMP Adoption and Helps Meet Conservation Goals

Enhanced BMP Challenge Demonstration Project: Helping Pennsylvania Farmers Improve Water Quality through Conservation Incentives

Cut Costs by Optimizing Nitrogen

Water Quality Trading: An Emerging Opportunity for Agriculture in Minnesota

BMP Challenge 2008 Corn Price Set

For corn grown for grain in 2008, the BMP CHALLENGE program will use the USDA Risk Management Agency (RMA) additional price election of \$4.75 per bushel to compensate participating corn producers. Prices of corn grown for silage vary by region and range from \$26.50 to \$32.00 per ton. More information regarding per state silage prices can be found on the USDA-RMA website, <http://www3.rma.usda.gov/apps/pricesinquiry/>.

These corn prices are factored into the net returns analysis to determine if a payment is due to participating farmers. Any loss in yield and income is weighed against farmer savings in tillage or fertilizer costs to determine net returns. For example calculations, visit the [Nutrient BMP CHALLENGE](#) and [Reduced Tillage CHALLENGE](#) webpages.

Guaranteeing Net Returns Eases BMP Adoption and Helps Meet Conservation Goals

With real income on the line, farmers can be reluctant to try new practices. Income guarantees can ease the transition. Since its pilot program in 2000, the BMP CHALLENGE has helped more than 100 corn producers experiment with conservation practices on their farms, without risk to income.

In 2007, the BMP CHALLENGE provided a safety net for 35 farmers in four states, guaranteeing performance of nutrient management and reduced tillage on a total of 3,128 acres. The program uses side-by-side comparison strips in farmer fields to evaluate yield. A net returns comparison then factors in fertilizer or tillage cost savings to determine the net economic return to the farmer.

Participating farmers work with a local crop advisor, Extension or other expert to develop their nutrient or tillage recommendation, following university-recommended protocols for their state. They select a field up to 160 acres in size to test the new approach. A carefully located check strip receives the farmer's conventional practice. At harvest, the farmer and advisor assess and report yields and fertilizer or tillage costs. If net returns decline versus check strip performance, the farmer receives a cash payment to make up the difference.

BMP performance over time

In 2007, university recommendations for nitrogen were outstripped by greater than average yields and higher

corn prices. Yields on the check strips averaged 173 bu. per acre, 10 bushels more than the strips fertilized at BMP rates. Factoring in nitrogen fertilizer savings, farmer returns were \$15.74 per acre less when fertilizing at the BMP rate. The BMP CHALLENGE made up this shortfall with cash payments to participating farmers.

University-recommended rates are not designed to maximize yield in any one year, so it makes sense that farmers and yields might come up short in high-yielding years. In general, these occasional shortfalls are made up in years when yields don't justify that extra amount of fertilizer. However, recent increases in corn prices have thrown another variable into the mix. When corn prices increase, increasing fertilizer rates to some extent can be economically justified.

This relationship between corn prices and "ideal" nitrogen fertilizer rates is recognized in a new approach to estimating the right amount of nitrogen to apply. The new system factors in corn prices, nitrogen fertilizer costs, the crop grown the previous season in the same field, and yield potential estimated from a database of historic yields for the region.

The Corn N-Rate Calculator, located at <http://extension.agron.iastate.edu/soilfertility/nrate.aspx>, projects higher N rates when corn prices are high. For example, for corn grown for grain and following soybeans in Northern Illinois with an expected selling price of \$2.20 per bushel, the predicted best rate would be 117 lbs. of N per acre. When we plug in a current price of \$4.75 per bushel, the calculator calls for 149 lbs. of N per acre. In other words, the increase in corn prices is expected to pay for the extra 32 lbs. of N in an average year.

The BMP CHALLENGE can be used to guarantee net income for corn farmers who would like to experiment with the Corn Nitrogen Rate Calculator to compute estimated N rates. The Calculator was developed at Iowa State University in collaboration with other North Central Region scientists from the Universities of Illinois, Minnesota and Wisconsin.

Since 2000, the program has helped over 100 farmers meet net income and conservation goals. On average, the Nutrient Management program has reduced N use by 40 lbs. per acre on average for a total of nearly 77.8 tons. These reductions also contribute to reduced emissions of nitrous oxide, a potent greenhouse gas, by nearly 5,122 lbs.

Starting in 2005, the BMP CHALLENGE approach was used with Pennsylvania corn farmers in nitrogen-impaired watersheds to reduce N below recommended rates. The idea was to test the economic feasibility of this approach for improving water quality. This Enhanced Nutrient Management project has generated N reductions of more than 48.1 tons at a cost of about \$3 per lb., competitive with other approaches including cover crops. The Pennsylvania Enhanced Nutrient Management program reduced nitrous oxide emissions by approximately 3,166 lbs. This means that since 2000, between the two programs, N has been reduced by nearly 126 tons over the past seven years and nitrous oxide emissions have been reduced by nearly 4.15 tons!

In 2006, the program was used to support conservation tillage adoption. Participating farmers use no till, strip till, ridge till or other techniques aiming to preserve at least a 30% residue cover after planting. The change in tillage creates a significant learning hurdle as farmers and their advisors adjust tillage and planting equipment, weed management strategies and other key system components. This learning curve is an ideal target for the guarantee, protecting farmer net income as they learn the new approach that reduces soil erosion and nutrient runoff. To date, participating farmers have been compensated for a nearly \$20 per acre reduction in net returns while reducing sediment by more than 1700 tons and associated soil phosphorus loss by nearly 2300 lbs. Reducing tillage also contributed to a 570 ton reduction in carbon dioxide greenhouse gas emissions. In 2008, the program is working to provide additional support to farmers and advisors new to conservation tillage, including connecting them with experienced farmers, to smooth out the learning curve and reduce program costs.

2000-2007 RESULTS	Nutrient BMP	Reduced Tillage	Enhanced Nutrient Management
Total acres, 2004-2007	3885 acres	1139 acres	3554 acres
BMP yield, average and range	158.9 bu./acre 15.4 - 220	159.9 bu./acre 72 - 192	121.6 bu./acre 9 - 217
Check-strip yield, average and range	165.4 bu./acre 16.7 - 230	172.2 bu./acre 110 - 210	129.6 bu./acre 10 - 238
Farmer net returns after fertilizer or tillage savings, average and range	(\$3.90) (\$53.03) - \$81.25	(\$18.98) (\$157) - \$130	(\$19.95) (\$111) - \$105
Total N use reduction	155,712 lbs. N	-	96,237 lbs. N
Estimated sediment reduction	-	1709 tons	-
Estimated P load reduction	-	2278 lbs.	-
Estimated N ₂ O reduction	5,122 lbs.	-	3,166 lbs.
Estimated CO ₂ reduction	-	570 tons	-

The project has been supported by a number of funders, most recently including the USDA Natural Resources Conservation Service Conservation Innovation Grant Program, the Pennsylvania Department of Environmental Protection, the Pennsylvania Department of Agriculture and the Chesapeake Bay Commission. For additional information, including applications for the 2008 season, see <http://bmpchallenge.org/downloads.htm> or call (608) 232-1425.

Enhanced BMP Challenge Demonstration Project: Helping Pennsylvania Farmers Improve Water Quality through Conservation Incentives

How can we keep farms in our landscapes and meet water quality goals in severely impaired watersheds? A new option developing in Pennsylvania may offer a solution. Over the past three years, Pennsylvania corn farmers have participated in the BMP CHALLENGE to reduce nutrient use and runoff by applying nitrogen at a rate 15 percent below university recommendations. Data on 38 farmers and 4,000 acres over three years has shown consistent, cost-effective results.

The BMP CHALLENGE guaranteed these farmers that they would not lose net income by participating. The CHALLENGE uses a check strip approach to measure impacts on yield, input costs and farmer bottom line.

Though farmers were offered the option of applying the university-recommended rate of nitrogen, all but one chose to apply 15 percent less. The pilot reduced nitrogen use by about 27 pounds per acre. In addition to the guarantee, farmers and their crop advisors also received an additional incentive to compensate them for their time to manage the check strips at planting and harvest.

At less than \$3 per pound of nitrogen reduced at field level, the program proved to be cost-effective relative to other approaches, and below the cost projected by a 2004 Chesapeake Bay Commission study. Overall, 96,000 pounds of nitrogen were *not* introduced into the watershed as a result of the pilot.

Farmers were pleased enough with the program that 16 out of 18 participants elected to continue in 2007. Funding for the project was provided by the Pennsylvania Delegation of the Chesapeake Bay Commission, the Pennsylvania Department of Agriculture, the Pennsylvania State Conservation Commission, the Pennsylvania Department of Environmental Protection and the National Fish and Wildlife Foundation. Collaborators included

American Farmland Trust, Agflex, Team Ag and the IPM Institute of North America. For more information, contact Brian Brandt, American Farmland Trust, at (614) 221-8610 x. 201 or bbrandt@farmland.org.

Cut Costs by Optimizing Nitrogen

Rising nitrogen costs make applying optimum amounts of nitrogen increasingly important. To improve profitability, corn growers can perform the Pre-Sidedress Nitrate Test (PSNT). This test measures soil nitrate shortly before the corn crop's greatest nitrogen demand in midsummer. The test can reduce nitrogen application rates, thereby cutting costs.

Here's how it works:

1. The farmer decides to use the PSNT approach before the season starts.
2. Before or at planting, the farmer will apply less nitrogen than usual - less than the crop will likely need.
3. Soil samples are usually taken when the corn is 6 to 12 inches tall and are processed by an approved lab for testing.
4. Any additional nitrogen need indicated by the test is applied to the corn crop as a sidedress to the soil immediately adjacent to the growing plants.

The crop may already be a foot tall by the time of the second application of nitrogen, so specialized application equipment must be readied beforehand. The second application of nitrogen will immediately be taken up by the crop with little opportunity for escape into the environment.

The PSNT originated in Vermont and has since been used in other corn-producing states, sometimes called the Late Season Nitrate Test or Late Spring Nitrate Test. In general, 21 to 30 ppm soil $\text{NO}_3\text{-N}$ is considered optimum for adequate corn growth without additional N applications. Many states have specific recommendations for using the test, including use in conjunction with corn stalk-nitrate testing or with manure applications. Growers should check with local Extension, crop advisors and/or experienced farmers before using this approach.

The BMP CHALLENGE program is recruiting corn farmers who would like to try the PSNT approach during the 2008 growing season. The BMP CHALLENGE will guarantee these farmers will not lose net income as they experiment with the PSNT to optimize nitrogen rates and reduce costs. For more information, contact Megan Havelka, BMP CHALLENGE, at (608) 232-1425 or megan.havelka@bmpchallenge.org.

Water Quality Trading: An Emerging Opportunity for Agriculture in Minnesota

How can water quality be "traded"? And what's agriculture's role? A collaboration funded by the USDA NRCS Conservation Innovation Grant Program has been working to provide answers to those and other questions through a series of workshops in Minnesota.

Water quality concerns in Minnesota include excess phosphorus from upstream sources, contributing to algal growth and reduced dissolved oxygen levels. Low oxygen threatens fish and other aquatic life and is a particularly serious threat in the lower 22 miles of the Minnesota River.

Trading seeks to improve water quality and optimize costs. For example, a city's wastewater treatment plant might require a multi-million dollar hardware upgrade to reduce nutrients and sediment to levels that would allow it to add residents to the system and stay within permit limits. Farmers in the same watershed might be able to deliver even greater improvements at a much lower cost by setting aside cropland near the waterway and installing buffers that reduce soil and nutrient runoff. By compensating farmers for lost production instead of upgrading the plant, taxpayers get improved water quality and lower tax bills.

Trading in Minnesota was stalled by a lawsuit brought against the Minnesota Pollution Control Agency in 2004 over a permit for a new wastewater treatment plant for Annandale and Maple Lake. At issue was whether the agency's granting of the permit violated federal law by allowing a new source of pollutants into an already impaired water body. The agency successfully argued that a recent phosphorus reduction of 27 tons per year

achieved by Litchfield more than offset the proposed ton per year load from the Annandale/Maple Lake project. Although no formal trade agreement was negotiated, the state supreme court ruled that the MPCA's offset based approach had been reasonable.

Since the decision, the agency and its advisory committee have worked to draft rules for trades in the state to provide clear concise guidance on what types of trades are credible. Other trading opportunities, not impacted by the lawsuit, are currently underway in Minnesota. Two industries have offset their pollutants of concern with non-point trades. In addition to these trades, there exists a wastewater treatment plant to wastewater treatment plant trading permit which covers 39 facilities. The wastewater treatment plant to wastewater treatment plant trading permit is intended to reduce phosphorus levels by 35 percent in five years. Effluent limits for existing facilities take effect on May 1, 2008. Thirteen of 39 facilities are not expected to meet limits for the 2008 season and may be in the market for trades early in 2009. Two new facilities operating in the basin are already trading between themselves. Additionally, there are two trade agreements which have been executed for operations that are not yet up and running.

Three workshops to inform ag professionals about trading and the BMP CHALLENGE were held in Minnesota since November 2007, with additional events to be scheduled in the latter half of 2008 and early 2009. Participant comments included "very useful information" and "topics, location, time, and pros and cons to trading were the things I liked most about the workshop." More information on past and upcoming workshops is posted on www.bmpchallenge.org, or call us at (608) 232-1425.

Megan Havelka
The BMP CHALLENGE

The BMP CHALLENGE is a collaboration including Agflex, American Farmland Trust and the IPM Institute of North America.



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