Nutrient Management Briefings – 2004

A Quality Assurance Team Review of 2004's Nutrient Management Plans

Prepared by the Wis. Department of Agriculture, Trade and Consumer Protection

This report summarizes the status of nutrient management (NM) in Wisconsin and describes the findings from the Quality Assurance Team's (QAT) review of 15 NM plans written for the 2004-growing season. This report is sent to all qualified NM planners, and those providing planning assistance to agricultural producers.

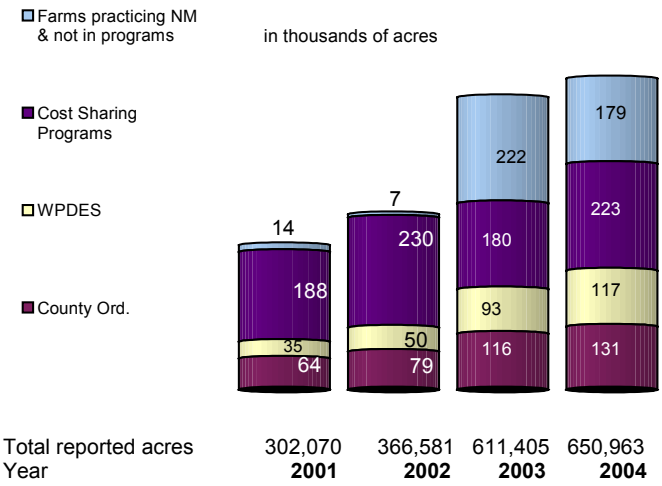
Qualified planners are *certified crop advisors, professional agronomists* certified through the American Society of Agronomy; *soil scientists* certified through the Soil Science Society of America; *certified professional crop consultants* certified by the National Association of Independent Crop Consultants, or farmers developing their own NM plans and submitting to DATCP a NM Planning Checklist form with their address. As of December 2004, 297 farmers and 685 planners in Wisconsin hold certifications through these organizations. The number of planners has remained relatively constant.

A properly developed and implemented NM plan will balance nutrients available in manure, legumes, and commercial fertilizer with the crop's nutrient requirements as determined from the field's soil test. The NM plan will reduce excess plant nutrient applications; thereby reducing water pollution. A properly developed NM plan will have value to the producer, maintain soil productivity; maximize profitability; and achieve realistic crop yields.

When Are Nutrient Management Plans Required?
A nutrient management (NM) plan is required when a producer is regulated under a county ordinance or a DNR Wisconsin pollution discharge elimination system permit (WPDES). A NM plan is also required when a landowner voluntarily accepts government cost-share dollars for NM or the installation of manure storage or barnyard runoff control structures.

In 2004, about 38% of the total acres with NM plans have them because of local ordinances or CAFO permits and cost sharing is not required. This is up 4% since 2003 and is expected to increase as more plans are required with local ordinances.

2001-2004 Nutrient Management Program Acres



Total reported acres	302,070	366,581	611,405	650,963
Year	**2001**	**2002**	**2003**	**2004**

About 257 NM plans (covering 134,360 acres) reported in 2004 were written to the phosphorus based nutrient management 590 standard (2002). This is a substantial increase from the 38 NM plans (25,260 acres) written to this standard in 2003.

What's the Progress?
The DATCP tracks NM acreage planned through bulk fertilizer suppliers and through the enclosed *NM Plan Checklist* form submitted by farmers, agronomists, and public agency staff. Suppliers of bulk fertilizer to farmers are required to track nutrient management planning. These suppliers reported 1,412 plans covering 611,405 acres in 2003 and 1,449 plans covering 650,963 acres in 2004. In both years, the suppliers reported that 12% of the farmers purchasing bulk fertilizer had 590 plans. Since 1995, Wisconsin farmers have developed and reported 6,879 nutrient management plans covering approximately 2.5 million acres. About 60% of the acres reported each year with the NM Plan Checklist are updated plans.

Inside Insert:

Certified soil testing laboratories - Manure Production and Nutrient Tables - NM Plan & WI Comprehensive NM Plan Checklists (March 1999, July 2002-590 standard versions, Proposed checklist)

Print these documents and the 590 standards from:
http://www.datcp.state.wi.us/arm/agriculture/land-water/conservation/nutrient-mngmt/planning.html

- Fertilizer, NM, and Siting Rule Public Hearing Notice -

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In 2004, NM planners (farmers and agronomists) submitted *Nutrient Management Plan Checklist* forms for 1,014 NM plans covering 479,232 acres. This reported acreage is a 15% increase from the acres reported in 2003. The NM plans were reported from 44 counties in 2004, 40 counties in 2003, and 50 counties in 2002. Of the 479,232 acres in NM plans, 297 farmers are writing their own plans on 73,736 acres, about the same as in 2003. In 2004, 109 private agronomists developed and reported 717 NM plans for county, state and federal programs. These plans cover 405,496 acres or 18 % more acres than in 2003 with 28 fewer agronomist planners reporting.

2004 NM Plan Review Summary

Soil Test Information:

Nutrient management plans must have a complete set of soil test results. The soil tests should be from all fields that have nutrients mechanically applied sometime during the crop rotation. All soil test reports should include appropriate field identification, acreage, and crops and a field's predominant soil type. In 6 of the 15 plans that were reviewed, the field's soil type was not in the soil test report. Some of these plans had incorrect nitrogen (N) recommendations as a result.

Nutrient Application Restrictions:

Five of 15 plans did not properly designate areas with nutrient application restrictions. All nutrient management plans should have an aerial photo or a field map to identify fields. Also all nutrient management plans should have a soil survey map to show soil types and slopes. Nutrient management plans must prohibit winter spreading on frozen or snow covered soil on slopes greater than 12%. The NRCS soil survey map or a USGS 1:24,000 scale topographic map must be used to identify perennial waters. All NM plans should prohibit winter nutrient applications around all perennial waters. The distance of this setback varies depending on which version of the 590 standard (1999 or 2002) is required for the program or ordinance. P based nutrient management plans should have winter manure applications prohibited within areas draining to perennial waters that are 1,000 feet from the ordinary high-water mark of lakes, ponds, or flowages or within 300 feet from rivers or streams.

We saw 6 of the 15 plans were lacking conservation planning information. A conservation plan is required to be developed for all crop acres farmed. Starting in 2005, if a current conservation plan is not available or attainable, a soil loss assessment should be developed using Snap Plus. The Snap Plus computer program calculates soil loss, nutrient balances, and the Wisconsin Phosphorus Index. To learn more about Snap Plus, see page 3.

Requirements for N and P based Plans

UW recommendations are designed to achieve optimal economic returns for farmers. N recommendations are based on the soil-specific yield potential and organic matter. Even though soil-specific N recommendations have been in place in WI for some time, the concept of yield goal-based N recommendations continues to be used by corn growers. Data collected in mid-west states since 1990 show that N rates do not vary relative to corn yield.

All NM plans need to list the field's previous crop in order to properly credit any legume nitrogen (N). In addition, phosphorus (P) based plans must consider the crop P removal using estimated yields over a four year crop rotation. Yield goals should be attainable and based on average growing conditions and historical yields. For P based plans, farmers have the following two choices to assess the risk of P losses for each field:

- Soil test P level – on fields testing 50 PPM to 100 PPM soil test P, soil P levels must not build over a 4 year crop rotation. On fields testing greater than 100 PPM soil test P, P must be applied at less than removal over a 4 year crop rotation.
- Wisconsin Phosphorus Index contained in Snap Plus – fields with P Index levels greater than 6, should not have P additions until the level drops below 6.

Plan Narrative and Field Summary:

A narrative at the beginning of the plan should explain the operation's practices and clarify why the plan includes or is lacking information. We like to see a field by field crop and nutrient summary in the plan that provides a clear list of recommendations to the farmer. Any fertilizer grade and rate needs to be included in the plan. Have your field numbers correspond to the nutrient management plan and conservation plan. If the field numbers are different, provide a table to match fields.

Manure Information:

Your plan should list the season when manure and fertilizers are applied. To provide a plan that is easy to understand and use, only recommend about two manure rates and group fields according to need. A color-coded manure spreading map could provide an easy reference for the manure applicator. Update a manure information worksheet to compute the manure produced annually. Only 2 of 15 plans were lacking information related to manure produced and the ability to apply planned application rates. The annual nutrient management plan needs to allocate the available manure, making sure that suggested application rates are attainable and in compliance with the 590 standard. To calculate available nutrients, you may use book values from the 590 standard Conservation Planning Technical Note WI-1 or use a manure analysis. Using a manure analysis is recommended for operations reducing phosphorus fed to livestock and poultry.

When Can We Develop SNAP Plus NM Plans?
The Soil Nutrient Application Program (SNAP Plus) is a software tool to implement the P-based Nutrient Management Standard 590. It is being developed by the UW-Madison under the direction of Professor Larry Bundy, Soil Science. We expect a pilot release of a fully functional version before Spring 2005.

The Snap Plus computer program calculates soil loss, nutrient balances, and the Wisconsin Phosphorus Index to predict potential phosphorus losses from a field. The field's soil type, percent slope, length of slope, crop rotation, tillage, soil erosion level, distance from the edge of each field to the perennial water, and the presence of contouring practices are part of the Phosphorus Index calculations.

SNAP Plus automates nutrient management planning and should reduce paperwork for farmers while providing them with a record-keeping system that is easily updated. SNAP Plus uses a simplified version of RUSLE2, which NRCS endorses, to provide an assessment of soil erosion rates using the crop producer's current rotations, tillage, and nutrient application practices. The SNAP Plus home page, where you can download the most current version, is located at http://www.soils.wisc.edu/Snap-Plus/ .
This tool will bring conservation planning and nutrient management planning together to provide a valuable implementation tool for producers to manage their field's soil.

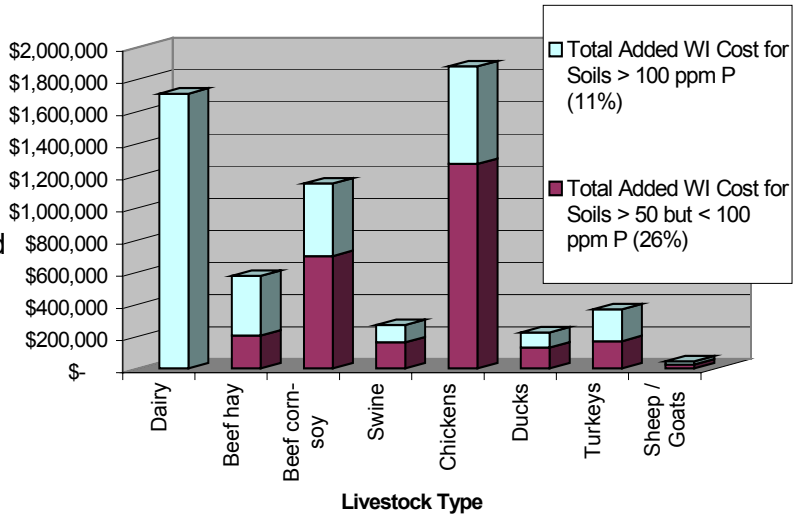
Transitioning to the New 590 Standard
The "proposed 590 P-based NM standard" is a set of nutrient management practices that are meant to protect both surface water and groundwater quality from nitrogen (N) and phosphorus (P) while ensuring farm profitability. By following the standard, farmers manage their fertilizer, manure, and other nutrients (N-P-K) to maximize profitability while minimizing the risk of potential environmental problems.

The USDA Natural Resources Conservation Service (NRCS) is the sponsor and custodian of this proposed standard. NRCS and the DATCP will be taking the proposed 590 P-based NM standard to public hearing in March 2005 (see insert for times and places).

DATCP hopes to adopt the proposed standard in ATCP 50 (Soil and Water Resource Management rules) after the March 2005 hearings. This rule will meet DNR's non-point performance standards with which all Wisconsin farmers will be expected to comply. DATCP also needs the 590 standard as part of its upcoming Livestock Siting regulations (ATCP 51). DATCP's current rules cite an outdated nutrient management standard which does not manage phosphorus very effectively. We hope to have a single standard in Wisconsin that meets the needs of farmers and the agencies (DNR, DATCP and NRCS). The proposed standard appears to have the best chance of achieving this goal. Failure to develop a common standard will result in great confusion among farmers, agronomists, and nutrient applicators.

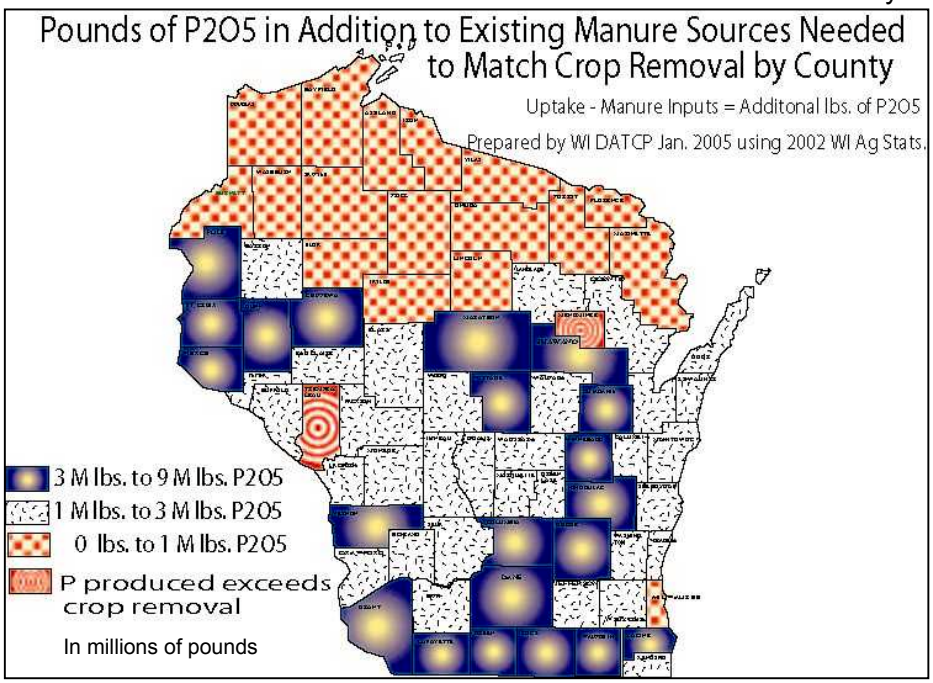
What are the additional costs of following a P based standard?
DATCP calculated field simulations using Snap Plus nutrient management software in 5 counties across Wisconsin, using 8 livestock species, and 3 soil test P levels. DATCP estimates an increased annual cost of $6.2 million dollars to comply with P-based nutrient management plans versus N-based nutrient management plans. These costs are based on the need to apply manure to more acres. The application costs assume $.005 per gallon for liquid manure or $2 per ton for solid manure. DATCP found no increased cost to meet the proposed P based 590 standard compared to the March 2000 N based 590 standard for fields with soils testing less than 50 PPM phosphorus. Of the 650,717 Wisconsin soil samples tested between the years 1995-1999, 63% percent (409,952 samples) were in this less than 50 PPM soil test P range. To see the proposed ATCP 50 rule revision and to view the results of the cost simulations go to:
http://www.datcp.state.wi.us/arm/regulation/soil_water.html

Annual Breakdown of the Estimated $6.2 Million Cost of P based Nutrient Management



Do We Have Enough Land To Manage P?

If all the manure were collected from all the livestock and people in each county of Wisconsin, and it was balanced against the P that crops can remove, would we have enough land? Yes, all but 2 counties can balance P inputs with P uptake on their crop land. Applying less P than crop removal will lower soil test P levels slowly. Plants must remove 18 pounds of P_2O_5 per acre to lower the level in most soils by 1 PPM soil test P. To put this in perspective, a 180 bushel per acre corn crop can remove 70 pounds of P_2O_5 annually and drop soil test P levels almost 4 PPM. With Wisconsin's average soil test P level at 52 PPM, we do not need all the commercial P fertilizer that is currently being purchased. Rather, we need to rely on the manure nutrient resources available in our counties and across the state. The key is to distribute our nutrients to where they are needed.



Implementing the NM Performance Standard

County land and water resource management plans, approved by county boards, describe available funding and annual priority activities including implementing the performance standards for improving water quality. Wisconsin's nutrient management performance standard requires that producers through their nutrient management plans, manage soil nutrient levels to maintain or reduce nutrient delivery to water bodies. These NM plans must document that nutrient delivery to water will not alter the background water quality in *Source Water Protection Areas*, *Impaired*, *Outstanding*, and *Exceptional Resource Waters*.

The nutrient management performance standard becomes effective on January 1, 2005 in these special areas and on January 1, 2008 in other areas of WI. Counties conservation departments may choose to delineate where the NM performance standard is effective starting in 2005. These watersheds can be any area contributing drainage to *Source Water Protection Areas*, *Impaired*, *Outstanding*, and *Exceptional Resource Waters* that the DNR describes at: http://dnr.wi.gov/org/water/wm/wqs/303d/303d.html

http://dnr.wi.gov/org/water/wm/nps/ag/prohibitions.htm

After the NM performance standard becomes effective, a farmer "shall" have a NM plan for mechanically applied nutrients if at least 70% cost sharing is offered by state or local governmental agencies. A "qualified planner" shall approve the NM plan. The plan shall have soil tests from a DATCP certified soil testing laboratory. The plan shall comply with UW nutrient recommendations, and maintain tolerable soil loss levels for each field as stated in the P-based 590 standard.

Percent of 2004 Reported Acres from Checklists by Region and County

Counties reporting more than 15% *of their cropland acres with 2004 nutrient management plans are: Brown (56,891), Kewaunee (46,683), Oconto (20,866), Door (18,066), and La Crosse (15,743).*

Counties reporting 5% to 14% *of their cropland acres are: Marathon (38,632), Fond du Lac (30,664), Dane (29,116), Outagamie (26,274), Clark (24,258), Clark (20,050), Dunn (15,745), Winnebago (14,746), Pierce (14,280), Manitowoc (13,133), Waupaca (12,720), St. Croix (10,073), Eau Claire (9,670), Shawano (8,571), Waushara (7,361), Wood (6,141), Washburn (2,416), and Burnett (1,900), and Sawyer (1,726).*

NE 43.6% of acres (↑.3% from 2003)	NW 18.3% of acres (↓ .6% from 2003)	NC 14% of acres (↓ 1% from 2003)	SC 8.7% of acres (↓ 4.4% from 2003)	SE 9.2% of acres (↑ 3.6% from 2003)	SW 6.2% of acres (↑ 1.8% from 2003)
Brown	Barron	Marathon	Columbia	Dodge	Grant
Door	Buffalo	Portage	Dane	Fond-du Lac	Iowa
Calumet	Burnett	Waupaca	Green		LaCrosse
Kewaunee	Chippewa	Waushara	Jefferson	Green Lake	Lafayette
Langlade	Clark	Wood	Walworth	Washington	Sauk
Manitowoc	Dunn			Waukesha	Vernon
Oconto	Eau Claire				
Outagamie	Jackson				
Shawano	Pierce				
Winnebago	Polk				
	St. Croix				
	Sawyer				
	Taylor				
	Washburn				

Questions, comments, or suggestions about the Quality Assurance Team review of nutrient management plans should be forwarded to: Sue Porter, WI DATCP, P.O. Box 8911, Madison, WI 53798-8911
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