Nutrient Management Briefings – 2005

A Quality Assurance Team Review of 2005's Nutrient Management Plans

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

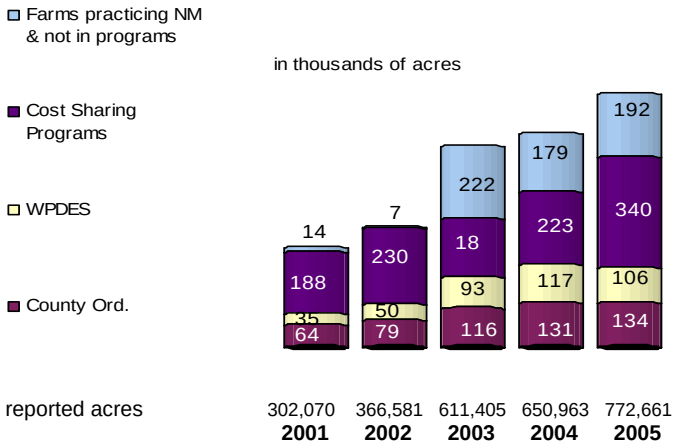
This report summarizes the status of nutrient management (NM) in Wisconsin and describes the findings from the Quality Assurance Team's (QAT) review of 15 NM plans written for the 2005-growing season. This report is sent to all qualified NM planners, and those providing planning assistance to agricultural producers.

Qualified planners are *certified crop advisors* and *professional agronomists* certified through the American Society of Agronomy. Or, *soil scientists* certified through the Soil Science Society of America. Or, *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 2005, 354 farmers and 698 other certified planners in Wisconsin are considered qualified NM planners. The number of planners has increased by 100 since 1999.

NRCS 590 NM Standard Revision 2005

The USDA-Natural Resources Conservation Service (NRCS) approved a new 590 standard in September 2005. This standard is in the process of being incorporated into Wis. Admin. Code ATCP 50 & 51. The new 590 was changed to improve implementation and environmental protection. The 590 nutrient management standard contains criteria for surface and groundwater protection that manages the amount and timing of all nutrient sources. A properly developed and implemented NM plan will reduce risks of acute and chronic runoff, maintain soil productivity, maximize profitability, and achieve realistic crop yields. These are annual plans that are based on soil tests, UW soil fertility recommendations, and possibly plant analysis. These plans must credit nitrogen from alfalfa for the first and second year when applicable. These plans must also credit N, P, and K from manure and fertilizer – against the soil test recommendations for the crops to be grown.

2001-2005 Nutrient Management Acres



Total reported acres	302,070	366,581	611,405	650,963	772,661
Year	**2001**	**2002**	**2003**	**2004**	**2005**

About 477 NM plans (covering 241,000 acres) reported in 2005 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.

Wisconsin's Progress

The DATCP follows 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. Bulk fertilizer suppliers reported 1,726 plans covering 772,661 acres in 2005. In 2005, the suppliers reported that 15% of the farmers purchasing bulk fertilizer had 590 plans, up 3% since last year. We see 314 plans and 161,000 more acres than in 2003 when this annual survey started.

Planners' Progress

In 2005, 517 NM planners (354 farmers and 163 agronomists) submitted *Nutrient Management Plan Checklist* forms for 1,313 NM plans covering 583,149 acres. This reported acreage is an 18% increase from the acres reported in 2004. The NM plans were

Inside Insert: Certified soil testing laboratories - Manure Production and Nutrient Tables - New NM Plan Checklists Print these documents and the 590 standards from: http://www.datcp.state.wi.us/arm/agriculture/land-water/conservation/nutrient-mngmt/planning.jsp

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reported from 49 counties in 2005, 44 counties in 2004, and 40 counties in 2003. Of the 583,149 acres in NM plans, 354 farmers are writing their own plans on 88,152 acres, a 16% increase in plans and acres over 2004. In 2005, 163 private agronomists reported 959 NM plans for county, state and federal programs. These plans cover 494,997 acres or 18 % more acres and 25% more plans from 54 more agronomist planners reporting than in 2004. Since 1999, we see an annual increase in acres reported of at least 15% per year.

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, or is offered, government cost-share dollars for NM or the installation of manure storage.

Updating ATCP 50 Wis. Admin. Code will allow state cost sharing to be provided to county land conservation departments, and then to farmers, for implementing the September 2005, 590 nutrient management standard when the update is complete. Under this existing DATCP rule, all farmers who apply manure or commercial fertilizer to cropland (not just livestock operators) must have a nutrient management plan. This requirement took effect on January 1, 2005 in certain watersheds, and will take effect on January 1, 2008 elsewhere. However, state law makes enforcement contingent on cost sharing for farms not regulated by other means. Enforcement is therefore limited by the availability of cost-share funds and state and local regulation authorities.

Farms that must comply regardless of cost-sharing include those holding a WPDES permit from the Department of Natural Resources, farms that claim farmland preservation tax credits, and farms that are required by local ordinances to have permits for manure storage or livestock facility expansions. Typically the nutrient management plans that do not require cost sharing make up about 1/3 of the plans reported. Current DATCP cost-share funding levels make it possible to target about 20,000 acres per year starting in late 2006 (less than 1% of Wisconsin's crop acreage). These cost-share funds will be mainly targeted where runoff has caused fish kills or well contamination or at priority farms noted in the county's *Land and Water Resource Management Plan*.

2005 NM Plan Review Summary

Nutrient Application Restrictions:

Designating nutrient application restricted areas was the area that needed the most improvement in the 2005 QAT review. It is not surprising that we have some confusion with what should be restricted, since we currently have planning occurring from 3 different 590 standards. However, we will soon have a single standard for all programs. Seven of 15 plans did not properly designate areas with nutrient application restrictions. All NM plans should have an aerial photo or a field map with legends that identify manure spreading restricted areas. All NM plans should have a soil survey map to show soil types and slopes. NM plans must prohibit winter spreading on frozen or snow covered soil on contoured slopes greater than 12%. Fields with no contours must prohibit winter spreading on slopes greater than 9%. All NM plans should prohibit winter nutrient applications within 300 feet perennial streams and 1,000 feet from the ordinary high-water mark of lakes, ponds, or flowages. The NRCS soil survey map or a USGS 1:24,000 scale topographic map must be used to identify these areas. These maps can be downloaded from the web. See the **Maps! Maps! Maps!** insert.

Who should provide nutrient restricted maps?

The best situation is that the county land conservation office and the NRCS office provide these maps to cropland operators when cost sharing or other requirements apply. Some counties make it their policy to provide these restriction maps for all farms in order to reduce the risk of runoff events. These maps and soil tests are the foundation of a basic nutrient management plan. If these maps are not provided locally, the nutrient management planner must develop them. Operations regulated under DNR - WPDES permits, may have additional restrictions listed in the permits.

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. In 3 of the 15 plans we found problems with the soil tests. The guidance in UWEX Publication A2100, *Sampling Soils for Testing*, should be followed when performing the soil sampling. All soil test reports should include appropriate field

identification, acreage, crops and a field's predominant soil type. The soil test summary must include the number of samples taken per field. When at least three samples are provided, the soil test recommendation program will remove samples that are significantly higher than the field average. This ensures that no part of the field is under-fertilized.

If fields are to have whole-field fertilizer applications based on a single recommendation, then they should be sampled in a "W" pattern with the proper amount of samples according to A2100. Likewise, if fields are to have variable recommendations in the field, then samples should be taken as A2100 specifies (on a 200' or 300' grids depending on the response range). The QAT looks for the proper amount of soil samples and maybe unaware if cores were taken in a "grid" or a "W", especially if the field has a single recommendation. If the sample size is too large to comply with A 2100, the QAT would note this as something that should be fixed in the next round of soil sampling. Soil samples should be sent to a DATCP certified laboratory. As of September 2005, the following laboratories currently hold certifications.

UW Soil & Plant Analysis Laboratory 5711 Mineral Point Road Madison, WI 53705 Ph: (608) 262-4364	UW Soil & Forage Laboratory 8396 Yellowstone Drive Marshfield, WI 54449 Ph: (715) 387-2523
Dairyland Laboratories 217 E. Main Street Arcadia, WI 54612 Ph: (608) 323-2123	Agsource Soil & Forage Laboratory 106 N. Cecil Street Bonduel, WI 54107 Ph: (715) 758-2178
Rock River Laboratory Route 3, N8741 River Road Watertown, WI 53904 Ph: (920) 261-0446	A&L Great Lakes Laboratories 3505 Conestoga Drive Fort Wayne, IN 46808 Ph: (219) 483-4759
Mowers Soil Testing Plus, Inc. 117 E. Main Street Toulon, IL 61483 Ph: (309) 286-2761	Logan Labs P.O. Box 1455 184 West Main Street Russells Point, OH 43348 Ph: (937) 842-6100

Soil Erosion Control:

We saw 5 of the 15 plans should update the sheet and rill soil erosion estimates in the conservation plans. A conservation plan should be developed for all cropland acres. The conservation plan must address cropping practices that control sheet and rill erosion to tolerable levels (T) and provides treatment of ephemeral soil erosion. Sheet and rill soil erosion calculations shall be based on current NRCS erosion prediction technology or the soil loss assessment calculated using the Wisconsin Phosphorus (P) Index model found in Snap-Plus. The Wisconsin P Index is based on results from P research and is a tool to rank fields on their potential to deliver phosphorus to surface water bodies. Get SNAP-Plus nutrient management software from http://www.snapplus.net. If you do not want to determine sheet and rill soil erosion rates yourself, contact your local conservation department for assistance in developing a current conservation plan.

N & P Management:

When using 590's soil test P management option to show that P can be properly managed, crop rotations and P inputs/removals must be listed in the nutrient management plan. This was not properly documented in 7 of the 15 plans. Another 3 of the 15 plans over applied annual N beyond 590 and *A-2809 Soil Test Recommendations for Field, Vegetable, and Fruit Crops,* or the annual N uptake by legume crops (page 8 of *WI Conservation Planning Technical Note Sept. 05*).

P based plans **only applying commercial fertilizer** during the crop rotation are allowed to combine annual P and K applications into a single application that does not exceed the total nutrient recommendation for the rotation.

P based plans applying **manure** or other organic byproducts during the crop rotation must choose either the soil test P management option or the P Index to assess the risk of P losses for each field within a farm tract.

Wisconsin P Index contained in Snap Plus – Fields with P Index levels greater than 6 over the crop rotation (up to 8 years) should not have P additions until the level drops below 6, unless required by UW soil test recommendations.

Soil test P level – Fields testing 50 PPM to 100 PPM soil test P must not build over the crop rotation (up to 8 years). Fields testing greater than 100 PPM soil test P must apply at least 25% less than the crop rotation removal (up to 8 years).

One of the plans reviewed had this simple method for tracking P balance.

Phosphorus and Potassium Levels Over the Crop Rotation		
2 years corn silage - 1 year soybean - 1 year corn grain		
	P2O5 lbs./ac	K2O lbs./ac
Corn silage after corn grain 25 T/ac		
Manure 9,000 gal/ac (8-8-22 per 1,000 gal)	72	198
Nutrient Removal	100	200
Balance after 1st year (inputs-removal)	*-28*	*-2*
Corn silage after corn silage 25 T/ac		
Manure 9,000 gal/ac (8-8-22 per 1,000 gal)	72	198
Nutrient Removal	100	200
Balance after 2nd year (inputs-removal)	*-56*	*-4*
Soybeans after corn silage 45 bu/ac		
Manure 4,300 gal/ac (8-8-22 per 1,000 gal)	34	95
Nutrient Removal	35	40
Balance after 3rd year (inputs-removal)	*-57*	*51*
Corn grain after soybeans 175 bu/ac		
Manure 9,000 gal/ac (8-8-22 per 1,000 gal)	72	198
Nutrient Removal	70	50
Balance after 4th year (inputs-removal)	*-55*	*199*

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. Here are many of the items that should be mentioned in a narrative and can be collected when interviewing producers. This information is also needed for using the Snap-Plus software.

Interview Information

- Farm name and address
- Annual manure volume by species, handling system, and manure analysis if that is available. Animal numbers if no other method of producing volume estimates is available.
- Farm map/photo showing location of fields with farmer's field names and locate fields on soil survey.
- Each field's crop rotation with current crop and tillage (fall chisel, fall moldboard, no-till, spring chisel, spring cultivation, spring moldboard, strip till).
- Field size (acres), farmer's field ID, government field ID and tract number. Have all NM plan field numbers correspond by providing a table, or by using Snap-Plus to match fields.
- Conservation plans with slopes and slope lengths, noting field names or boundary changes. If a conservation plan is not available, Snap-Plus provides default slope and slope length for each soil map-unit. These default measurements should only be used if the nutrient management planner will field-verified them during the implementation of the plan and make adjustments for accuracy in subsequent plans.
- Yield goals for those crops based on 3 to 5 year average.
- Planned and applied fertilizer product, rates, and when used in rotation.
- Normal manure management - rates, incorporation, season (s) of application and when applied in rotation.
- Field soil test information - pH, OM%, P, K matching field name on soil test to farmer's field name.
- Field variations in crop management, yield goals, manure, fertilizer, or tillage specific to a field (for example - no manure in the winter, let cows graze on stalks in the winter, gets worse yields than other fields, etc…)

2005 Reported Acres from Checklists by Region and County

Counties reporting 15% or more *of their cropland acres with 2005 nutrient management plans are: Brown (69,478), Clark (40,143), Fond du Lac (40,002), Kewaunee (32,124), Outagamie (30,461), Oconto (21,893), Door (20,605), and La Crosse (17,840).* The county with the largest increase in NM since 2004 was CLARK COUNTY (15,885 acres).

Counties reporting 5% to 14% *of their cropland acres are: Dane (38,047), Marathon (37,820), Manitowoc (25,299), Shawano (20,847), Winnebago (15,987), Dunn (13,616), Waupaca (13,549), Eau Claire (12,172), Pierce (11,715), St. Croix (11,786), Jefferson (9,145), Waushara (8,817), Buffalo (8,274), Pepin (7,252), Washington (7,170), Marinette (6,207), Calumet (6,006), Wood (5,202), Waukesha (3,211), and Washburn (2,907).*

NE 42.7% of acres (acres↑16% from 2004)	**NW 20.1% of acres** (acres↑25 % from 2004)	**NC 12.1% of acres** (acres↑5% from 2004)	**SC 9.6% of acres** (acres↑26 % from 2004)	**SE 8.9% of acres** (acres↑15% from 2004)	**SW 6.7% of acres** (acres↑24% from 2004)
Brown	Barron	Adams	Columbia	Fond-du Lac	Grant
Calumet	Buffalo	Juneau	Dane	Green Lake	Iowa
Door	Burnett	Marathon	Green	Ozaukee	LaCrosse
Kewaunee	Chippewa	Portage	Jefferson	Washington	Lafayette
Manitowoc	Clark	Waupaca	Walworth	Waukesha	Richland
Marinette	Dunn	Waushara			Sauk
Oconto	Eau Claire	Wood			Vernon
Outagamie	Pepin				
Shawano	Pierce				
Winnebago	Polk				
	Rusk				
	St. Croix				
	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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