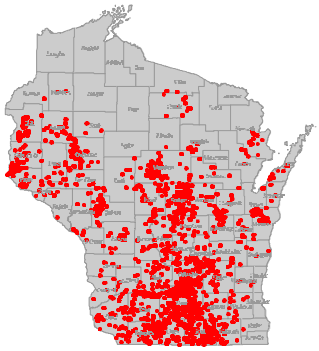
**WHAT WILL IT TAKE TO IMPLEMENT NUTRIENT MANAGEMENT IN WISCONSIN**

Susan M. Porter [1]

***Nutrients loss to nonpoint source pollution***

Point source pollution is from a defined source like a factory pipe or discharge from a waste water treatment plant. Nonpoint source pollution is also called runoff. Runoff pollution cannot be easily traced to a single source or point of origin. This runoff occurs when rainwater or snowmelt contacts soil, organic wastes, fertilizers, and other pollutants carrying them to surface and groundwater. Soluble nutrients and those attached to soil particles come from parking lots, roads, livestock lots, and crop fields. These nutrients and sediments are deposited in streams, marshes, and lakes causing reduced water-holding capacity, increased oxygen use, and accelerated plant growth. As plants die and decompose oxygen is consumed. If too little oxygen is left in the water resource fish kills may occur.

***Nitrate detections > 10 ppm***



Nonpoint source pollution of excess nutrients, specifically nitrate-nitrogen, can degrade ground waters. In Wisconsin, about 10% of private drinking water wells exceed the enforcement standard health advisory level of 10 PPM nitrate (DATCP, 1999). In focused monitoring in agricultural areas like the Lake Mendota watershed, over 65% of wells were above the 10 PPM nitrate enforcement standard (Betz, 2000).

***Federal & state directives to address nutrient management problems***

For many years, Wisconsin law has required large animal feeding operations, with 1,000 animal units or more, to be permitted by the Department of Natural Resources (DNR) through authority delegated by the United States Environmental Protection Agency (EPA). These operations are defined as point sources of pollution and are assigned in their permits, allowable effluent or pollution discharge limits. The United States Environmental Protection Agency and the United States Department of Agriculture's Natural Resources Conservation Service (NRCS) propose to clarify nutrient management expectations and enforcement for existing federal laws for all animal feeding operations through the use of Comprehensive Nutrient Management Plans (CNMP). These comprehensive plans, required for permitted operations and those receiving federal cost-share dollars, shall include proposed activities for manure containment, nutrient management, record keeping, erosion management, and should consider feed management options for lowering phosphorus levels in manure. Nitrogen (N), phosphorus (P), and potassium (K) crop nutrients are to be applied according to a new 590 standard that is currently being developed and required by EPA and NRCS to have additional phosphorus and nitrogen assessment tools. The manure containment system and the nutrient management plan, that is phosphorus based for some fields, is required as part of the criteria for establishing allowable effluent discharging for the large animal feeding operations having 1,000 animal units or more.

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[1] Nutrient Management Specialist, Wisconsin Department of Agriculture, Trade and Consumer Protection

***Proposed Water Quality Rules***

The 1997, Wisconsin Act 27 modified Wisconsin's pollution control programs. These changes required the state to develop agricultural and non-agricultural performance standards and agricultural manure management prohibitions for nonpoint sources. The 1997, Wisconsin Act 27 also required the state to identify a process to develop and distribute technical standards and conservation practices to support the performance standards and prohibitions. In addition, DATCP is required to develop nutrient management rules including outreach, incentive, and compliance provisions. Neither DATCP nor DNR rules require a farmer to change an existing facility or practice to implement manure management prohibitions and proposed performance standards unless the farmer is offered at least 70% cost-share funding (s.281.16 (3)(e)) if significant costs are incurred. Cost-sharing is not required for new operations.

DNR's proposed administrative rules contain agricultural prohibitions and performance standards to help meet water quality goals. **The manure management prohibitions** (s.281.16 (3)(a)) require the following of Wisconsin livestock operations: *No overflowing manure storage structures. No unconfined manure stacking. No direct runoff from feedlots/barnyards. No unlimited livestock access to waters of the state so that adequate sod cover (vegetation) cannot be maintained.* **The performance standards** propose the following for all agricultural operations: *Achieve cropland erosion rates that do not exceed tolerable soil loss (T). Protect riparian areas using a combination of crop residue cover and permanent vegetation. Maintain grassed waterways. Use NRCS standards for installation and abandonment of manure storage facilities. Use clean water diversions around feedlots. Use NRCS standards for implementing nutrient management.*

***Public comment on the proposed administrative rules***

In March 2000, DNR and DATCP held public hearings on the water quality administrative rules. The general comments we heard regarding ATCP 50 came from 846 individuals attending 10 hearings. We heard that the rules are too costly and that 70% cost share is inadequate. There was general support for the Animal Waste Prohibitions and for erosion control to the tolerable or "T" levels. Many expressed concerns that DATCP and DNR rules must be made consistent. For example, meeting erosion rates much less than "T" would be difficult near streams if manure had to be incorporated as part of nutrient management plan. Concerns were also expressed that the rules be enforced fairly and that a local and state appeal process be developed. Farmers were concerned with possible crop losses as a result of complying with a nutrient management plan. They wanted the flexibility inherent in nutrient management plans clearly documented in the rule. Many farmers also agreed that they could implement nutrient management plans if they were developed to the current 590 standard. However, they commented that a phosphorus based manure application would create financial hardship and is not clearly tied to improved water quality.

***Phosphorus Initiatives***

To improve policy makers' knowledge of phosphorus and factors influencing its transport to water resources, DATCP has requested an informational paper be developed by the University of Wisconsin to explain, in laymen's terms, what we know about phosphorus specific to Wisconsin. We are also assisting the University with funding research on management practices' effect on phosphorus losses and calibrating a Wisconsin phosphorus assessment tool.

***Nutrient management plan components***

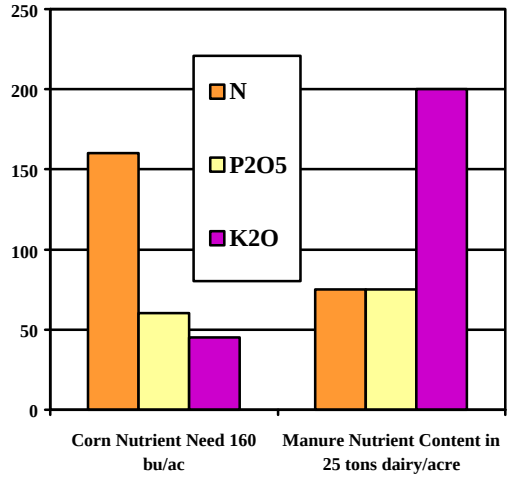
The proposed nutrient management performance standard directs all agricultural operations to apply nutrients to meet crop needs according to the existing Wisconsin's NRCS 590 standard. The foundation of this standard is soil testing at least every four years and using University of Wisconsin (UW) recommendations, which encourages applying nutrients to the economic optimum. The primary factor for establishing the N recommendations is the soil's potential to yield. As N rates increase to the economic optimum, crop recovery of N decreases and the potential of nitrate loss to the environment increases. P and K recommendations are based on a yield goal range (Kelling, Bundy, Combs, and Peters 1998).

Building upon the soil test recommendations, the standards also includes water quality components. A water quality component aimed at reducing manure runoff is the requirement that manure applications must not exceed 75 pounds $P_2O_5$ (phosphate) per acre per year unless incorporated within 72 hours. Additionally, surface applied manure and organic byproducts shall not run off the intended site during application. Manure or organic byproducts may exceed the crop's P need and be applied to the crop's N need if incorporated within 72 hours. Other water quality components of the standard are to not apply manure or organic byproducts to waterways and fields exceeding tolerable soil loss rates. The standard also restricts manure and organic byproduct applications within 200 feet of streams, rivers, lakes, sinkholes, creviced bedrock, and wells—unless applications are incorporated within 72 hours. Slopes greater than 12% can have manure applications only when the soil is not frozen or snow covered (NRCS, 1999).
When the nutrient need of a 160 bushel per acre corn crop is compared to the nutrients supplied by 25 tons of dairy manure (3-3-8), the corn crop requires more nitrogen. On the other hand, if the manure is applied to the nitrogen need of the corn crop, the phosphorus supplied by the manure is more than the annual crop can use. To bring the nutrient need of the corn into balance with the nutrients supplied through the manure, phosphorus applications could be less frequent or methods to reduce the phosphorus in the manure could be used .

***Comparison of corn nutrient needs with manure nutrient content***

***Nut***

To add flexibility to nutrient recommendations resulting from a soil test, and to account for variability of organic nutrient sources and their application, the following deviations from the soil test report recommendations are allowed. Use one or two manure application rates on a farm and group fields with similar nutrient requirements. The result of grouping fields will be easier implementation with some field's nutrients slightly higher and others slightly lower than the soil test recommendations. Soil test N recommendations may be increased by 20% for non-legume crops if the only source of N is from legumes, manure, or organic by products. If corn after corn is conservation tilled with greater than 50% residue after planting, the amount of N may be increased by up to 30 pounds per acre. If starter fertilizer is used, the first 20 pounds of N is not required to be counted toward crop needs. If a non-legume crop follows a legume, a N credit is taken. This legume credit is based on stand density and late season growth and may range from 80 to 190



pounds of N credit per acre. If nutrient deficiencies are suspected, a soil or tissue test can be taken to allow additional nutrient application recommended by the test. Organic N-P-K nutrients can be applied to legume crops according to N removal rates (a new alfalfa seeding can use 60 pounds of N per ton of alfalfa produced). Where alfalfa is to be maintained for more than 3 years, soil test potash recommendations should be increased by 20%. Excess P and K from organic nutrient applications can be stored in the soil and used later in the crop rotation.

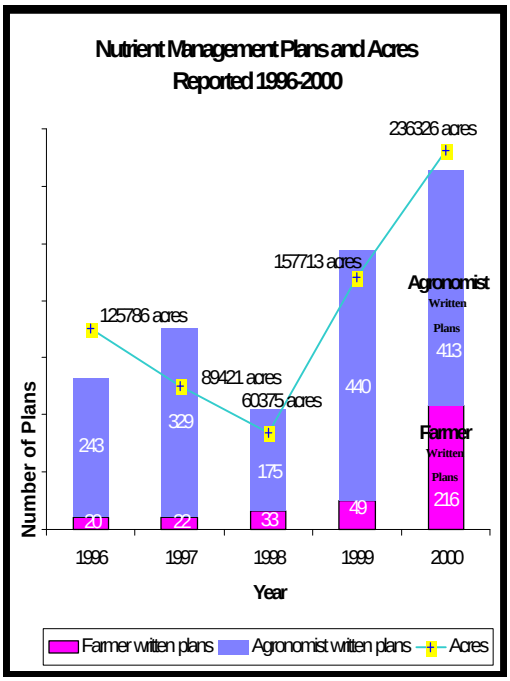
***How to implement the proposal***

Statewide priorities for implementing the prohibitions and performance standards include the farmland preservation program and agricultural facilities that contributes significant pollutants to impaired (303d list) or outstanding and exceptional resource waters. These statewide priorities are required to be addressed locally. Local governments are responsible for implementing the agriculture performance standards and prohibitions. County land and water resource management plans are the primary vehicle to determine resource management objectives, coordinate education, compliance, funding, and designate a local strategy for implementation. As of October 2000, 64 of the 72 counties in Wisconsin have established land and water resource management plans, which have been approved by the Department of Agriculture, Trade and Consumer Protection. Many of these plans include manure storage ordinances that will be a local priority and an implementation mechanism for proper manure storage installation, abandonment, and nutrient management planning. As of July 2000, 53 counties have manure storage ordinances that will assist in implementing performance standards and manure management prohibitions.

Included in the county land and water resource management plans, is the farmland preservation program that promotes land preservation, conservation, and provides tax relief to farmers. In 1999, farmland preservation provided 22,000 farmers $17.8 million in tax credits. The average tax credit being about $800 per farm. Farmers are eligible through exclusive agricultural zoning or agreements with DATCP. According to s. 92.07 (2), farmers must comply with the standards to claim tax credits. The DATCP administrative rule proposes that by 2007, counties will need to adopt the agricultural performance standards and prohibitions in their county policies for implementing the farmland preservation program. After this time, farmers will have 3 years to fully implement these standards as part of their conservation and nutrient management plan before credits could be denied.

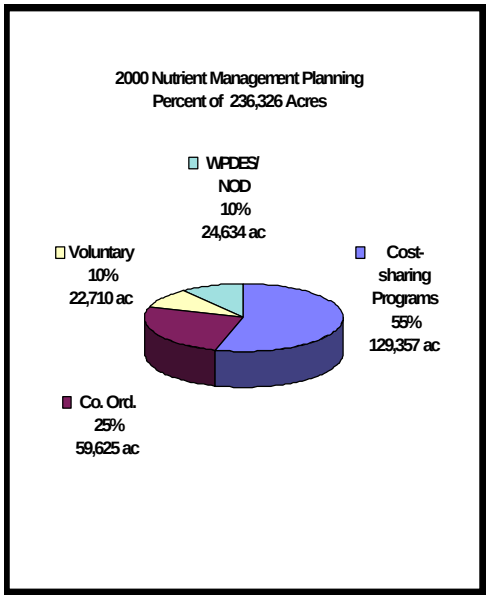
***Nutrient Management Planning Progress***

DATCP tracks nutrient management acreage planned and the number of crop advisors developing these plans through *the Nutrient Management Plan Checklists* submitted by conservation staff. The Checklists are required for every plan written for any county, state, or federal program. In 2000, 629 plans were prepared and reported on 236,326 acres. The number of farmer written plans has increased dramatically from 20 in 1996 to 216 in 2000. DATCP has provided funding to the University of Wisconsin for developing farmer training curriculum.




To be effective in improving nutrient management planning, every year, 15 nutrient management plans are reviewed and the farmers are asked 8 questions to determine the level of implementation, planning service value, and how NM planning could be more widely implemented. We are consistently finding that 14 of the 15 farmers intend to update their plan. They are finding these plans to be good record keeping tools and educational. When asked what the value of this service is to them, we see that pest management has remained consistently valuable at about $10 to $12 per acre. However, the value of nutrient management planning has dropped. For the 2000 growing season, 5 farmers valued the nutrient management planning service at $1-$3 per acre, and 5 farmers valued it at $3-$6 per acre. In previous years, more than half the farmers thought the nutrient management planning service to be worth $3-$6 per acre.

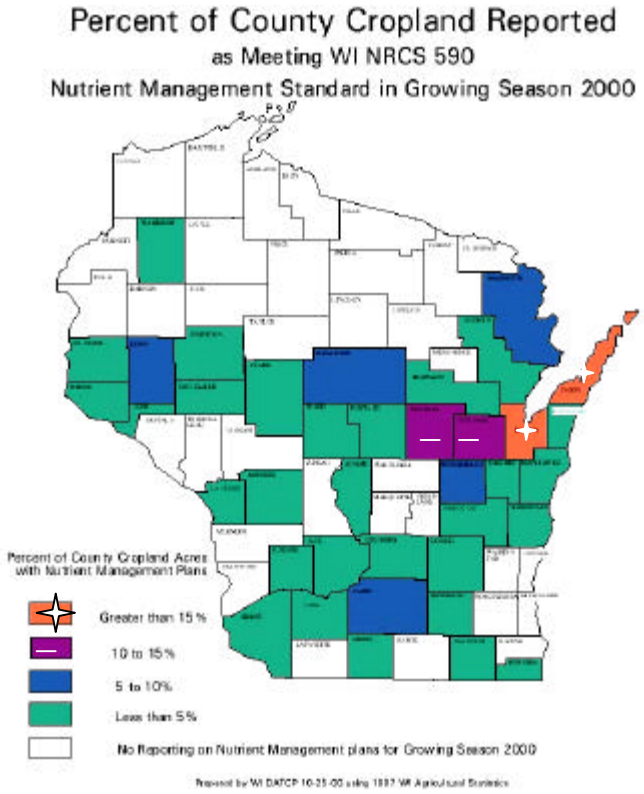
Cost sharing provided plans on 55% (129,357 acres) of year 2000's acreage. County ordinances accounted for 25% (59,625 acres) and DNR regulatory programs 10% (24,634 acres). Plans reported independent of cost sharing made up 10% (22,710 acres).




Comparing year 2000 to previous years, cost share acres dropped from 78% of the acres in 1998, down to 58% in 1999, down again to 55% in 2000. Conversely county ordinance acres increased from 8% of the acres in 1998, to 15% in 1999, to 25% in year 2000.

***2000 Nutrient Management Plans - Percent of Cropland by County***

For the year 2000, 38 counties reported nutrient management plans to the DATCP. Of these 38 counties 32 have increase the acreage under nutrient management plans. Six new counties are reporting acreage for the first time.

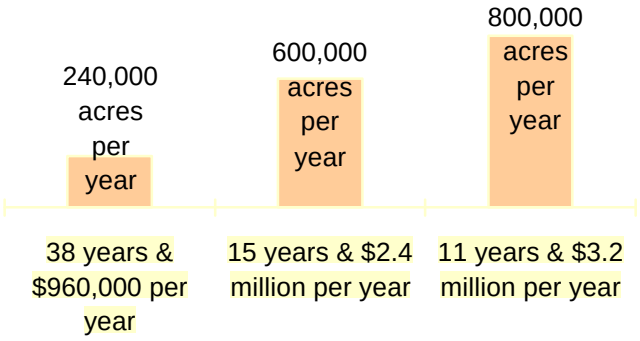



Using 1997 Wisconsin Agricultural Statistics Service cropland acreage for each county, we compared acreage under nutrient management plans for the year 2000. We found that Door and Brown Counties have more than 15% of their acres reported with nutrient management plans. Waupaca and Outagamie Counties are reporting 10% to 15% of their acreage as having nutrient management plans. Dane, Winnebago, Marinette, Marathon, and Dunn Counties all improved the amount of acres reported from 1999, and have 5% to 10% of the county planned.

***How long will it take and what's the cost?***

If we assume our goal is to implement nutrient management practices on nine million acres of cropland, we will need time, money, and a lot of work from the public and private sectors. Using $4 per acre for cost share, we can estimate acres planned and an annual cost if a farmer only receives a single year of cost sharing. If cost sharing is provided for 3 years, these cost figures would be *$2.8 million for 240,000 acres per year and it will take 38 years to cover 9 million acres. $7.2 million for 600,000 acres per year and it will take 15 years. For $9.6 million and an annual planning of 800,000 acres per year statewide, we could plan 9 million acres in 11 years.* Assuming most of the work will be in 50 counties, these counties will need to increase their planning numbers. If each of the 50 counties added 4,800 acres per year, planning 9 million acres would take 38 years. If these counties each planned 12,000 acres per year, 9 million acres could be planned in 15 years…These estimates are for new acreage and do not include plans that are being updated.

**Timeframes and Cost Sharing Needed To Implement Nutrient Management on 9 Million Acres**




The 2001 county staff funding from DATCP and DNR is $10.2 million. Cost-share for structural practices like waterways is $16 million, and nutrient management and tillage funding from DATCP is $70,000. Other funding sources are available for NRCS' Environmental Quality Incentives Program, the Conservation Reserve Enhancement Program, and locally funded county cost-sharing programs.

**Reference**

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K.A. Kelling, L.G. Bundy, S.M. Combs, J. B. Peters, 1998. *Soil test recommendations for field, vegetable, and fruit crops*. University of Wisconsin-Extension Publication A2809, 1-9

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