Wisconsin Nutrient Management Update

& Quality Assurance Team Review of 2016's Nutrient Management Plans

Prepared by Wisconsin Department of Agriculture, Trade and Consumer Protection **November 2016**

Implementing a nutrient management (NM) plan is one of the best practices farmers can do to protect their soil and water while providing food for the masses. The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) tracks farms that develop and update their 590 NM plans when NM Plan Checklist forms are submitted to DATCP by farmers, agronomists, and public agency staff. **In 2016 Wisconsin farmers reported 7,125 NM plans on about 2,960,872 acres, a 3% acre increase from 2015, covering 32% of Wisconsin's 9 million cropland acres.**

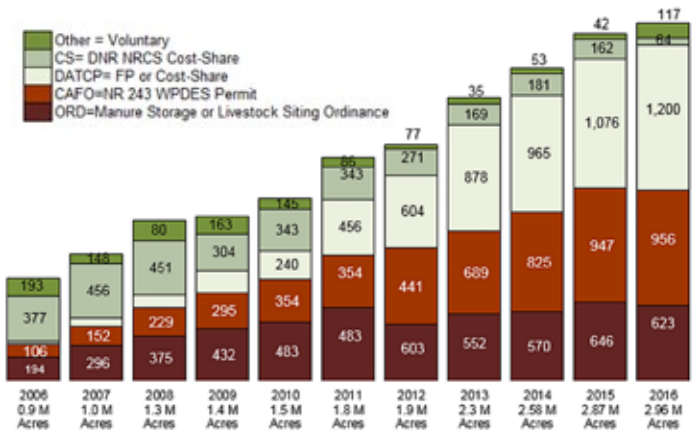
A NM plan is a cropping practice record that is **annually reviewed**, and updated when changes in crop management are made that deviate from the plan. Knowing where nutrients are needed and where they are not helps farmers allocate nutrients economically while also helping to ensure they are not over-applying nutrients, which could cause water quality impacts. A NM plan follows Natural Resources Conservation Service's WI 590 Nutrient Management Standard and is prepared by a qualified planner, which may be the farmer or a certified crop adviser. A NM plan **accounts for all N-P-K nutrients** applied, and planned to be applied, to fields over the entire crop rotation.

Who Wrote 2016's Nutrient Management Plans?

1,728 farmers wrote their own plans on 496,319 acres, 61,658 more acres than last year and a 14% increase in acres from 2015. In 2016 farmer-written plans accounted for 24% of all NM plans on 5% of Wisconsin's cropland acres.

5,397 **farmers hired 130 agronomists** to assist them with NM planning on 2,464,553 acres, 23,434 more acres than last year and a 1% increase in acres from 2015. In 2016 agronomists produced 76% of all NMPs on 27% of Wisconsin's cropland acres.

2006-2016 Nutrient Management Acres Reported by Program - in thousands of Acres



Nutrient Management Reported by County

68 of 72 WI Counties Reported NM Plans in 2016

Most Acreage with NMPs

Fond du Lac (179K)	Manitowoc (135K)	Rock (110K)
Marathon (166K)	Dane (133K)	Kewaunee (108K)
Brown (146K))	Outagamie (125K)	Clark (97K)
Jefferson (137K)	Dodge (124K)	Door (80K)

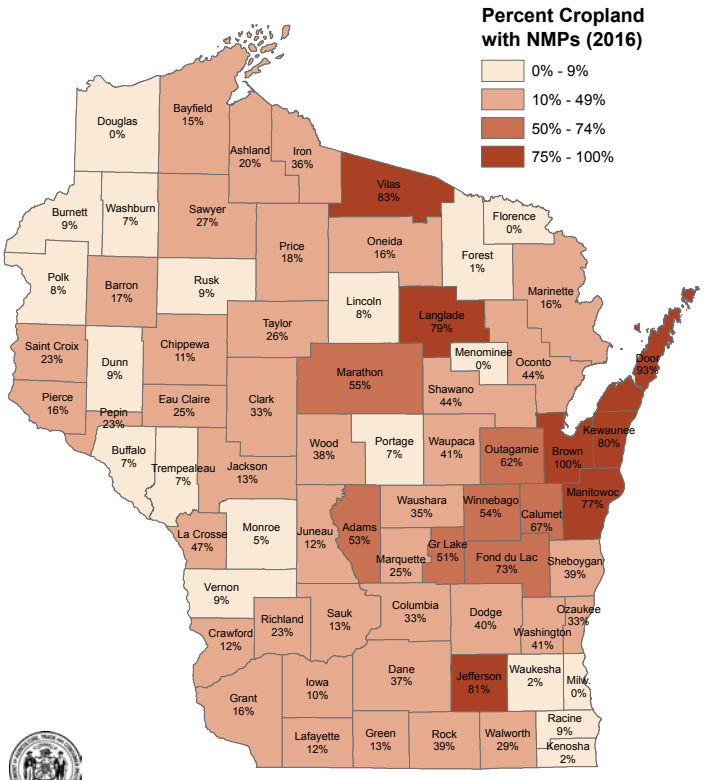
When Can a NM Plan Be Required?

Farms can be required to implement nutrient management with a $28/ac cost share offer or if:

1. Causing a significant discharge.
2. Regulated by local manure storage or livestock siting ordinances, or by a DNR WPDES permit,
3. Accepting manure storage cost share funds, or
4. Participating in the Farmland Preservation Program

Percent of County's Croplands with 2016 NM Plans

Calculated from county reported acres and 2012 National Agricultural Statistics of WI county cropland.

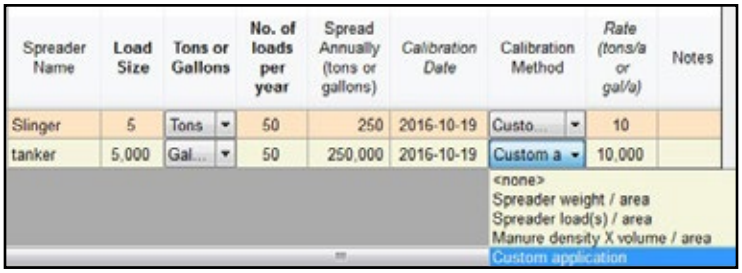


Map: Department of Agriculture, Trade and Consumer Protection

Since 1995 the agency staff and private sector agronomists of the Quality Assurance Team (QAT) have conducted reviews of NM plans with the goal of improving implementation and protection of our soil and water resources. In 2016 the QAT team (listed on page 6) reviewed 60 plans covering 31,167 acres. Twenty of these plans were farmer-written with the remainder written by CCA's.

As experience, education and tools improve we continue to see upward trends in plans that are correctly identifying and planning nutrient applications near sensitive features or during restricted times (e.g., nitrogen-restricted soils in the fall, winter applications of manure). SnapMaps can now automatically link many of these map attributes directly to the SnapPlus database, making planning applications around these features even easier. In addition, locally identified karst features are being added to SnapMaps in an effort to help with data sharing. Remember field-level data like private wells still need to be added manually.

Allocating the manure over the field's crop rotation to show adequate acres are available and calibrating spreaders continues to need additional attention by planners. Remember to only use application rates the farmer can apply. SnapPlus tools such as the manure allocator, rotation wizard, and daily log can quickly plan and update the manure applications. SnapPlus now has four options for spreader calibration in the Nutrient sources > Manure production estimator in the spreader table to help document manure application methods and rates.



Spreader Name	Load Size	Tons or Gallons	No. of loads per year	Spread Annually (tons or gallons)	Calibration Date	Calibration Method	Rate (tons/a or gal/a)	Notes
Slinger	5	Tons	50	250	2016-10-19	Custo...	10	
tanker	5,000	Gal...	50	250,000	2016-10-19	Custom a	10,000	

Keep up the good work! These are general statewide findings to which we will tailor our upcoming trainings and tools. If you need specific help with anything or are interested in being on QAT for 2017 - contact a DATCP NM Specialist today.

DATCP NM Specialists

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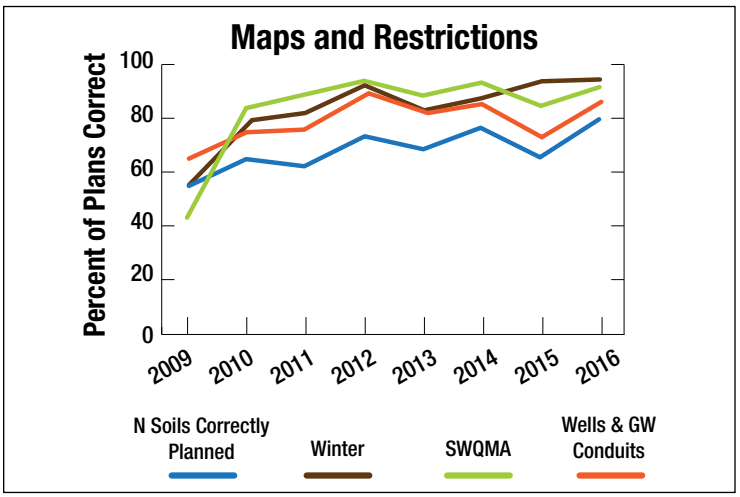

Figure 1. Shows steady improvements are being seen in both identifying restricted features and correctly planning applications near them.

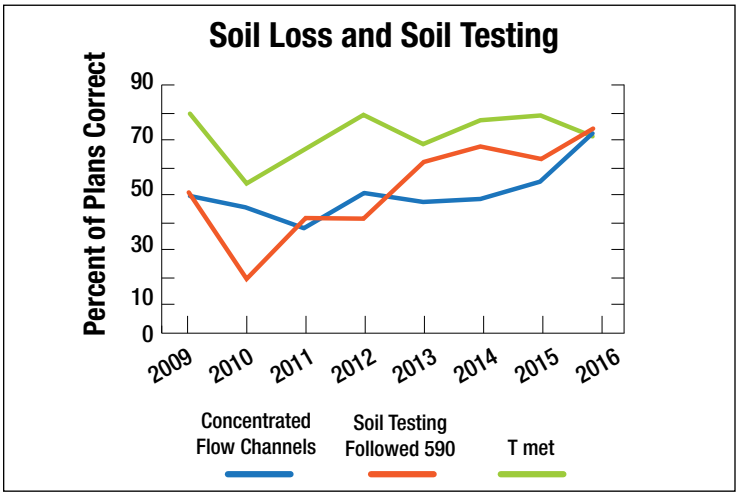

Figure 2. Shows the percentage of NM plans correctly soil sampling on all fields, describing the current state of concentrated flow channels and planning for all fields to meet tolerable soil loss (T).

Note: A small decrease in fields meeting T was not surprising, given the major soil updates that have occurred over the past two years. See page 4 for ways to manage soil loss or talk to your local county conservation department.

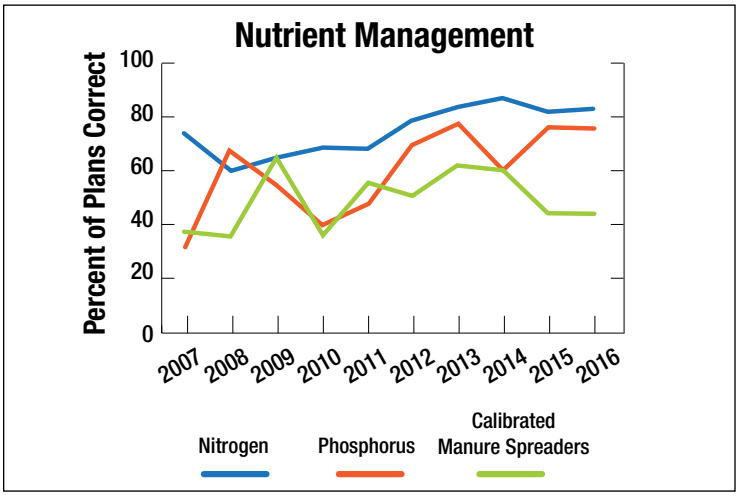

Figure 3. Shows the percentage of NM plans correctly applying nitrogen (N) and phosphorus (P) in both manure and fertilizers as well as using calibrated manure spreaders to plan and update applications.

Farmland Preservation Tax Credits Have Increased NM Acres

The Farmland Preservation (FP) program allows eligible landowners to claim a farmland preservation tax credit on their state income taxes in return for keeping their land in agricultural use and complying with Wisconsin's soil and water conservation standards. A large portion of the 2.96 million acres with nutrient management plans can be attributed to FP program participation. County land and water conservation staff are assisting over 12,000 FP participants to maintain their eligibility for this tax credit by helping with nutrient management plans and issuing certificates of compliance (COC) with unique identification numbers to landowners in compliance. The unique ID number found on **the COC will be required on Schedule FC-A, beginning with the 2016 tax year in order to claim the farmland preservation tax credit.**

Resources

To learn more about SnapPlus check out the YouTube videos and upcoming trainings at www.snapplus.wisc.edu.

SnapPlus 16 Release Brings BIG Improvements

SnapMaps Improvements:

- CAFO specific mapping features and spreadable acres
- The ability to create thematic field maps showing planned nutrient application rates, soil test levels, etc.
- Customizable field labels
- Auto calc of distance and slope to perennial water

Develop and update plans faster because SnapPlus16 automatically fills in each field's soils and nutrient spreading restrictions.

No more guessing which soil is the dominant critical! It chooses for you or gives you all the info you need to choose yourself.

Easier sharing with SnapMaps all you have to send in is the SnapPlus database – no more having to attach all the map pdf's. The maps are now inside the database.

Other features of SnapPlus 16 include:

- An Easy Group Builder that can help organize your data
- Short-cut buttons to the Nutrient Applications by Season table and the Cropping Grid
- Many new crops, including more options for cover crops

Get SnapPlus16 at the SnapPlus website:

http://snapplus.wisc.edu/

To see all the version improvements in SnapPlus, go to **Help > Help Contents > What's New in 16**

Cover Crops

SnapPlus has a number of crop choice options for annual or over-wintering cover crops following winter wheat, corn silage, soybean or corn for grain. In SnapPlus a cover crop is defined as not being harvested. The soil loss calculations in RUSLE2 for these cover crops include assumptions of the planting dates and dry matter. Calculated soil loss decreases with increasing dry matter production. The assumed planted dates for cover crops after winter wheat are in early August, those after corn silage are mid-September, and those after soybean and corn for grain are in mid-October. The small amount of available data on average cover crop dry matter yields in Wisconsin shows that the production assumptions used in SnapPlus' RUSLE2 are reasonable for the southern part of the state (Arlington research station and south) given those planting dates. The data also indicate that average production declines with later planting and more northern sites. **Planners should be aware that SnapPlus may be over-estimating the average erosion control benefits of cover-crops planted late or in northern and central Wisconsin.**

Changes to the NRCS Soil Survey Affect Nutrient Management Planning

The Natural Resources Conservation Service (NRCS) continually works to update its soil survey maps and the database of soil properties for each soil map unit. NCRS releases annual updates for the soil survey information and these soil updates are interpreted and incorporated into UW-Extension's Soil Group and Yield Potential designations for nutrient recommendations, the 590 Nutrient Management Restriction Maps, and the SnapPlus soil properties database. Importantly, partnering agencies and **soils data users must annually update the soils data when NRCS updates soils information. Otherwise, there will be differences between their soils data and the official Web Soil Survey.**

Currently NRCS is in the multi-year process of assessing soil map unit characteristics and ensuring they are consistent across county boundaries. In this process, the characterizations of soil properties that affect yield potential, such as available water capacity, have been refined for some soil map units. In addition, the NRCS has adjusted two of the factors related to sheet and rill erosion calculations: soil erodibility (K) and tolerable soil loss (T). These factors are now determined using consistent formulas for all soil map units across the nation. As a result, the calculated soil loss for many Wisconsin fields will now be higher or lower even without changes to field management. Some fields will require more conservation practices to stay productive and below T, and some will be easier to maintain within conservation goals.

Photo: NRCS

Things You Can Do to Meet T:

Photo: NRCS

1. Restart the rotation in 2015 and plan forward up to 8 years with tillage and crops the farmer is willing to implement.
2. Let your alfalfa stands go grassy. Because older stands of alfalfa often become quite grassy, use the crop "alfalfa grassy three yrs plus" in the 3rd and subsequent years of alfalfa in your rotation. The grass in the stand does improve its ability to control erosion. In all versions of SnapPlus, "alfalfa" means a pure stand of alfalfa with no grass.
3. Consider putting in contours and contour strips where you can.
4. Try no-tilling the first crop after alfalfa.
5. Try one less tillage pass than you would usually use.
6. Surface apply manure. The solids provide plant residue that can reduce erosion.
7. No-till your corn-soybean rotations, or stop growing soybeans on fields with low T values.
8. Consider creating pastures on erosion sensitive fields.
9. Double crop winter rye for forage, then corn silage, and till as little as possible.
10. Consider adding a cover crop into your rotation. Keep in mind that if using a cover crop requires an additional tillage pass, it may offset the erosion reduction from the cover crop itself.

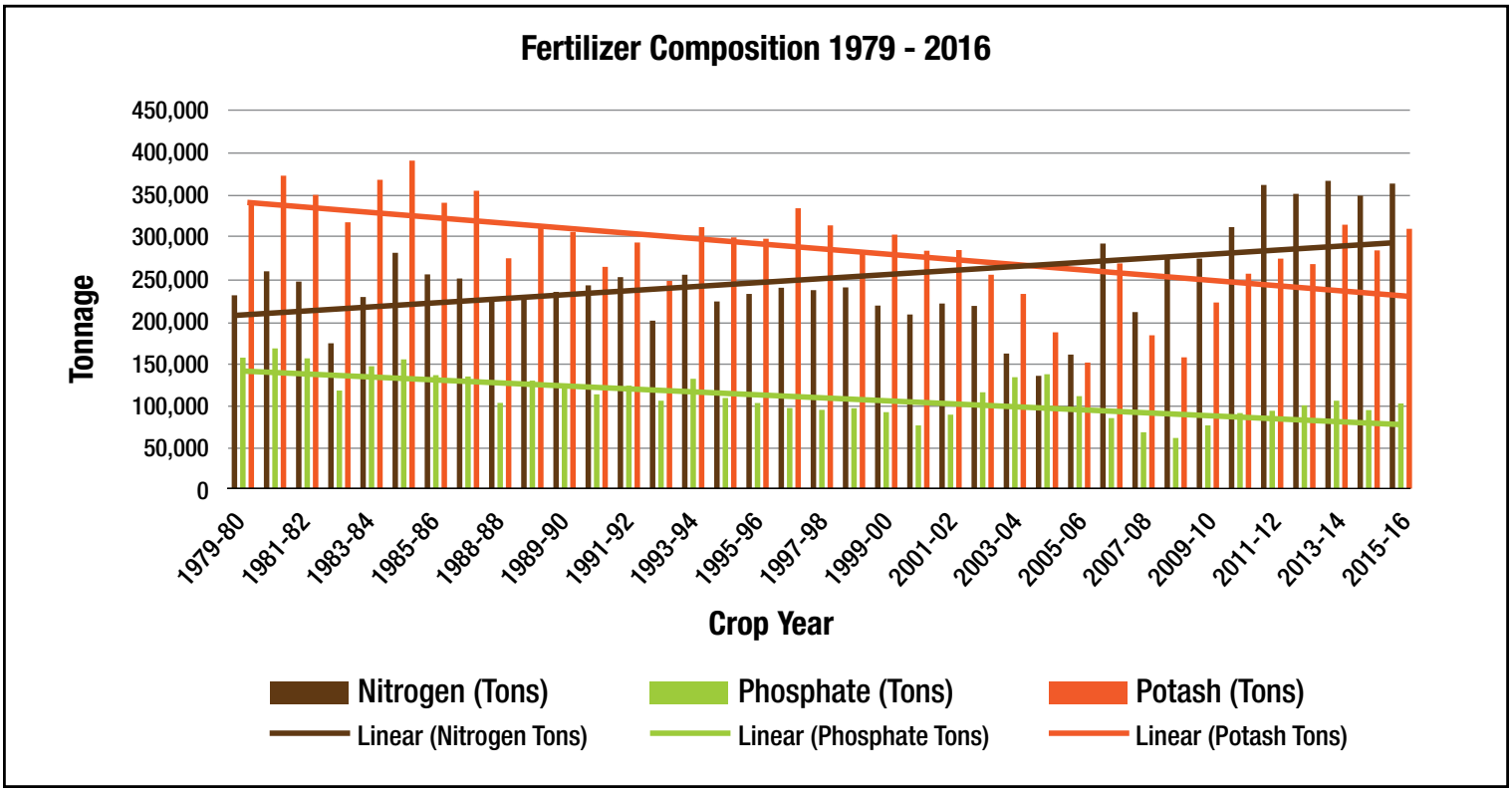

Figure 4

Soil Sampling Continues Upward Trend

Information compiled from the years 2010-2014 shows a steady increase in the number of soil samples submitted to DATCP-certified soil testing laboratories, continuing an upward trend that began in the period of 1990-1994 (see Figure 5). This is not unexpected since having current soil tests is one of the most important first steps in developing a 590 compliant nutrient management plan, and the number of cropland acres with a plan continues to grow.

An examination of Bray-1 soil test phosphorus (P) trends 1995 - 2014 shows that the statewide average is leveling (see Figure 5). Samples submitted from 2010 - 2014 to DATCP certified labs had an average of 52 ppm P, compared to 51 ppm P from 2005 - 2009. Examining median soil test P trends by county over the 1995 - 2014 period, shows 30 counties with a significant linear decrease in soil test P in submitted samples. The median soil test P change ranges from -8.47 to -0.22 ppm per year. Largest drops in soil test P were observed in Oneida (-8.47 ppm / yr), Marinette (-1.16 ppm/ yr), and Barron (-1.01 ppm / yr) counties. Oneida's large drop may be due to relatively few samples being analyzed (118 per year on average). Another 39 counties had no statistically significant linear trend over the 1995 - 2014 time period. Three counties showed a statistically significant upward linear trend in median soil test P. These counties were Adams (+1.90 ppm/ yr), Portage (+2.27 ppm/ yr), and Juneau (+3.46 ppm/yr). Since 1995, these three counties have increased soil sampling by an average of approximately 200%. It is likely that the increase in soil sampling is due to the NM requirement for Farmland Preservation and concentrated animal feeding operations (CAFO). When drawing conclusions, it is also important to remember that these are linear trends of samples

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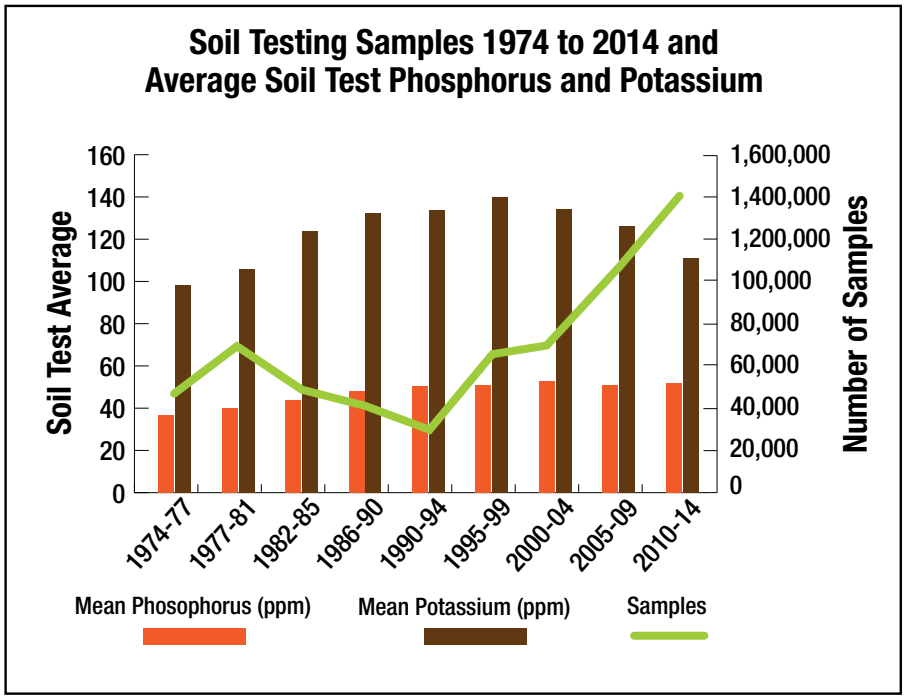

Figure 5

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submitted to DATCP-certified labs, and are not from the same field year after year, nor does each sample represent an equal number of acres.

Potassium levels in soil samples have declined a bit, with a state average of 111 ppm between 2010 and 2014. This continues a statewide downward trend from a peak of 140 ppm in the years of 1995-1999 (see Figure 5).

When we look at Wisconsin fertilizer tonnage from 1979 - 2016 in Figure 4 we see an increase in nitrogen consumption and decreases in phosphorus and potassium consumed that is also reflected in the soil tests.

Public Hearings on ATCP 50 Wis. Admin. Code

Public hearings are scheduled on proposed changes to ATCP 50, the administrative rule that includes nutrient management planning and implementation. Proposed rule changes include incorporating the 2015 update to the Natural Resources Conservation Service (NRCS) 590 Nutrient Management Technical Standard. The updated technical standard includes additional protections for surface water and groundwater resources, but also incorporates needed flexibility to achieve those protections across diverse landscapes and farming operations. Administrative rule changes are required before the updated 590 NM standard can be used to implement nutrient management as required by permits, ordinances, or cost share programs. For more information about the ATCP 50 rule revision visit:

https://datcp.wi.gov/Pages/Programs_Services/ATCP50.aspx

Hearing dates, locations and times include:

- **Monday, Jan. 9, 2017, from 2:00 - 4:00 PM and 5:30-7:30 PM**

  Chippewa Valley Technical College, Business Education Center, Room BEC 103a, 620 West Clairemont Avenue, Eau Claire

- **Thursday, Jan. 19, 2017, from 2:00 - 4:00 PM and 5:30-7:30 PM**

  UW- Platteville, Markee Pioneer Student Center, University North Room, 1 University Plaza, Platteville

- **Monday, Jan. 23, 2017, from 2:00 - 4:00 PM and 5:30-7:30 PM**

  Fox Valley Technical College, Room A170A, 1825 N. Bluemound Drive, Appleton. Participants should park in the north parking lot and enter through Entrance 16.

- **Thursday, Jan. 26, 2017, from 2:00 - 4:00 PM and 5:30-7:30 PM**

  Prairie Oak State Office Building, DATCP Board Room, Room 106, 2811 Agriculture Drive, Madison

Remember

Nutrient management plans must be based on soil tests performed by a DATCP-certified lab, which must follow specific testing procedures to ensure accurate results for Wisconsin soils. Labs not certified are using different test methods with different results that CANNOT be compared to Wisconsin soil testing procedures or used in SnapPlus.

New Soil Test Labs Now Available

There are now six DATCP-certified soil testing laboratories to serve the nutrient planning needs of Wisconsin farmers. The newest to become DATCP-certified is Minnesota Valley Testing Laboratories Inc., of New Ulm, Minnesota. DATCP certified soil testing labs are:

- A & L Great Lakes Laboratories (Fort Wayne, IN)
- AgSource Soil & Forage Laboratories (Bonduel, WI)
- Dairyland Laboratories (Arcadia, WI)
- Minnesota Valley Testing Laboratories, Inc. (New Ulm, MN)
- Rock River Laboratory (Watertown, WI)
- UW Soil & Forage Laboratory (Marshfield, WI)

Photo: NRCS

2016 Quality Assurance Team Members:

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