Wisconsin Nutrient Management Update

November 2018

Prepared by the Wisconsin Department of Agriculture, Trade and Consumer Protection

Implementing a nutrient management (NM) plan is one of the best practices farmers can use to protect their soil and water resources and farm profitability. The Wisconsin Department of Agriculture, Trade and Consumer Protection (DATCP) annually tracks NM plans on farms through NM plan checklists submitted from farmers, agronomists, and public agency staff.

In 2018, Wisconsin farmers reported 8,220 NM plans on 3.3 million acres covering 36.6% of Wisconsin's 9 million cropland, about the same as 2017.

Who wrote 2018's NM plans?

- **1,998 farmers wrote their own plans on 615,765 acres.** This is 9% more farmers, covering 79,251 more acres than last year. Farmer-written plans accounted for 24% of all NM plans. See Figure 3 on page 2.
- **6,222 farmers hired 316 agronomists to assist them with NM planning on 2,735,712 acres.** These numbers are unchanged from 2017. In 2018, agronomists produced 76% of all NM plans.

County conservation programs are the primary mechanism for NM plan implementation. They issue permits under local ordinances, provide cost-sharing, offer education and training, and secure conservation compliance from Farmland Preservation (FP) program participants. Other DNR and federal programs also have roles in implementation. See Figures 1 and 2.

A NM plan follows the USDA Natural Resources Conservation Service's (NRCS) WI 2015-590 NM Standard. A NM plan is a dynamic planning tool that is annually reviewed, and updated to reflect actual crop management practices. A NM plan is prepared by a qualified farmer or certified crop advisor planner.

Who needs a NM plan? All farms!

Some farms voluntarily plan, others are required to have a plan when applying nutrients to any pasture or field if:

- Offered cost-share for NM or manure storage,
- Participating in the FP program,
- Regulated under a county ordinance for manure storage or livestock siting,
- Regulated under a WI DNR Pollutant Discharge Elimination System (WPDES) permit,
- Found causing a significant discharge.

Percent of County Cropland with 2018 NM Plans

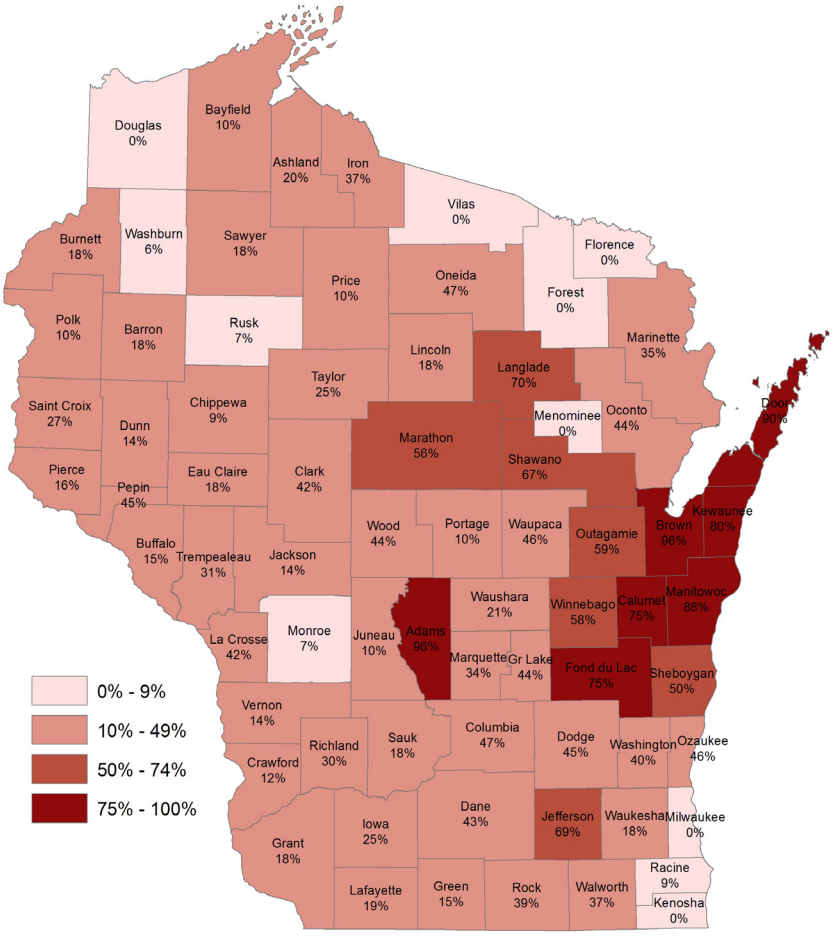


Figure 1 Cropland acres derived from National Agricultural Statistics Service, Census of Agriculture, 2012. Pasture land not included.

2008-2018 NM Plan Acres Reported by Program

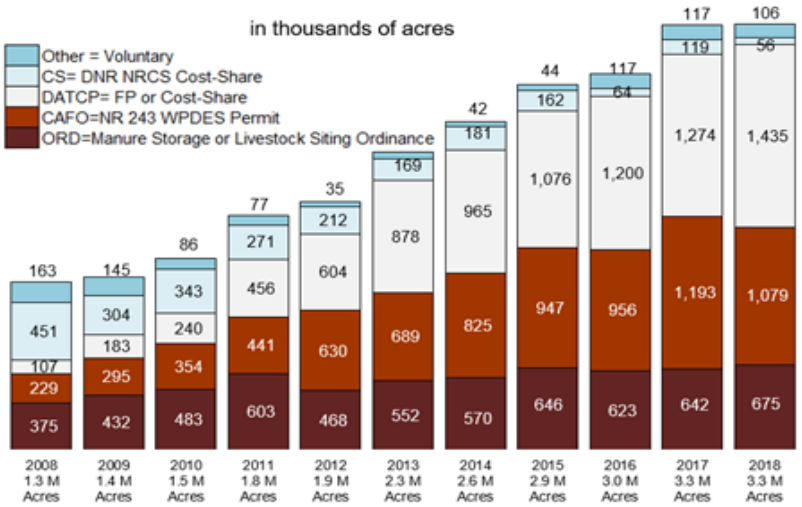


Figure 2. Nutrient management plan acres derived from NM plan checklists reported to WDATCP. USDA-NRCS NM plans on 11,000 acres may not all be included for 2018.

Results: 2018 Quality Assurance Team NM Plan Review

Since 1995, the Quality Assurance Team (QAT) has reviewed NM plans to identify areas where plans meet planning requirements and areas needing improvement. In 2018, QAT team members, listed on page 4, reviewed 76 plans covering 35,763 acres. Fourteen of these plans were farmer-written with the remainder written by Certified Crop Advisers (CCA).

The team's plan reviews found the **best NM plan components** were identifying and limiting nutrient applications near sensitive features like wells, surface waters, and fall nitrogen restricted soils. SnapMaps, which automatically links these map features to the plan, is likely the reason for this success.

The following areas need improvement:

Soil Testing: 55% of the plans followed soil sampling requirements on all their fields by taking 1 sample every 5 acres every 4 years. Many farms were only missing a few samples while others had tests older than 4 years. See Figure 4.

With slim profit margins, the expense of soil testing can get squeezed out of the budget. If you are purchasing commercial fertilizer, then soil testing every 4 years is money well spent.

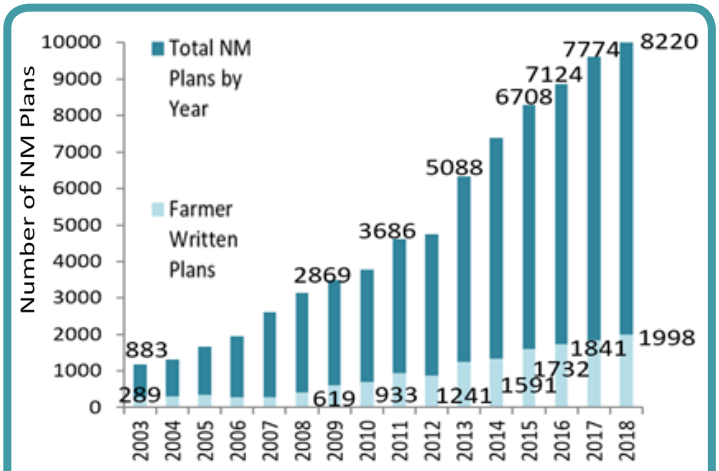


Figure 3 Farmers write more NM plans every year.

Contact your county about **Nutrient Management Farmer Education (NMFE) grants**, which can reimburse farmers for the cost of soil testing if they participate in a class to write their own plans. Go to https://datcp.wi.gov/Pages/Programs_Services/NMFEGrants.aspx for more information.

Soil Erosion: 68% of the plans met tolerable soil loss (T) on all fields. Most of the fields exceeding T can be attributed to a correction made to SnapPlus' RUSLE2 management templates for small grains + straw removal. In SnapPlus versions prior to 17, the RUSLE2 calculations for small grains with straw removal (barley, oats, rye, triticale, and wheat) did not account for the straw removal operation. SnapPlus 17 corrected this calculation. Calculated soil loss may now be higher for rotations that include these crops. See Figure 4.

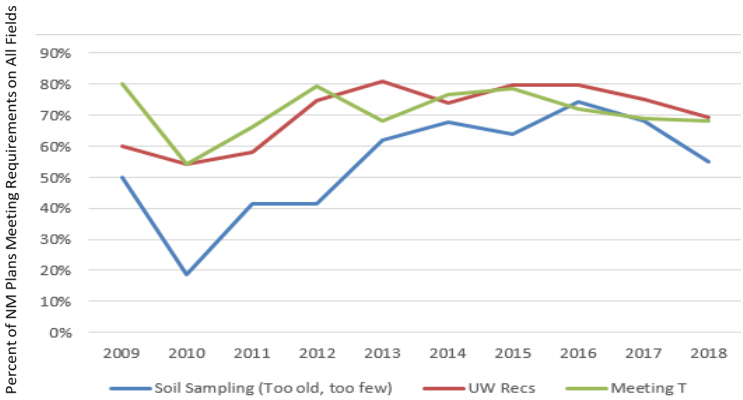


Figure 4 Although we show improvement meeting NM plan requirements on all the farm's fields from 2010, we need to reverse the recent decline in meeting soil testing, Univesity of WI Recommendations, and meeting T.

Nutrient applications: 69% of the plans followed the nutrient recommendations on all fields. Most of the fields exceeding University of Wisconsin-Extension Pub. A2809, "Nutrient application guidelines for field, vegetable, and fruit crops in Wisconsin" were for commercial phosphorus (P) fertilizer. See Figure 4.

Corn P recommendations are not equal to crop removal unless soil tests are in the optimum range, 16-20 parts per million P on loamy soils. When fields have high soil tests and no P recommendation, up to 100 lbs of 9-23-30 corn starter fertilizer as a *subsurface* starter application is allowed.

Here's an example based on a plan reviewed that shows the value of following A2809 recommendations: The fertilizer applications for an 80 acre corn field with a 231-250 bu/acre yield goal cost $171.23/acre. The applications exceeded A2809 P recommendation by 150 lbs/acre. Changing the fertilizer applications to meet the A2809 P recommendations with the same yield goal cut the fertilizer cost to $110.07/acre, a **$61/acre** difference. Will the farmer recoup the extra $4,892 spent on fertilizer?

2015-590 NM Standard now in effect

As of February 1, 2018, chapter ATCP 50 Wis. Admin. Code requires that farmers follow the 590 standard adopted by NRCS in 2015. Starting with the 2019 crop year, **farmers and planners should follow the 2015-590 NM Checklist.**

Find the Checklist at: https://datcp.wi.gov/Pages/Programs_Services/NutrientManagement.aspx.

2015-590 nutrient spreading restrictions in the **fall, spring, and summer:**

- Stay 50' away from conduits to groundwater, unless nutrients are deposited by pasturing animals or applied as a starter fertilizer to corn.
- Use practices to protect water quality for all nutrient applications in the Surface Water Quality Management Area (SWQMA). A SWQMA drains to and is within 1000' of lakes/ponds or 300' of rivers.

In **winter**, when frozen or snow-covered soils prevent effective incorporation at the time of application:

- Do not mechanically apply nutrients in the SWQMA or within 300' of conduits to groundwater.
- Do not exceed the P removal of the following growing season's crop. Manure can't exceed 60 lbs of P2O5/acre and no more than 7,000 gallons/acre.
- Do not surface apply liquid manure/organic by-products during February and March in areas where DNR Well Compensation funds provided replacement water supplies for wells contaminated with livestock manure or on Silurian dolomite soils.

A Winter Spreading Plan is required for all farms mechanically applying manure and/or organic by-products during the winter.

The amount of manure to be winter applied = Amount of winter manure produced - [Winter manure stored + Winter manure grazed]

When the map and manure information is entered into SnapPlus, the **Winter Spreading Report (NM6):**

- Calculates winter manure produced, in 14 and 120 days, from the animal numbers entered into the Manure Production Estimator
- Shows manure storage and capacity
- Shows a list of low-risk fields best suited for emergency manure applications
- Lists the **two winter application practices** selected for each field in the Cropping screen
- Accounts for manure applied mechanically and through grazing applications

To set up grazing in SnapPlus, add grazing manure as a source to the Nutrient screen. Use the Grazing Herd Setup tab to create one or more groups of grazing animals. Then, use the Grazing Estimator to calculate the tons/acre of manure applied. SnapPlus flags ensure that applications do not exceed the N and P limitations of this standard.

From NM6: Winter Application Strategies

- Leave all crop residue (this prohibits removal of silage or bedding) and no fall tillage.
- Apply on no more than 25% of the field during each application waiting a minimum of 14 days between applications.

PICK TWO Winter Spreading Practices for Fields with concentrated flow channels or slopes greater than 6%

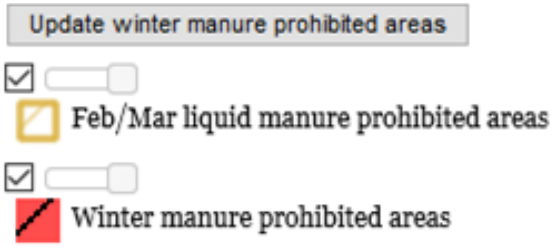
For fields with concentrated flow channels, use 2 of the 7 options. For fields with slopes greater than 6%, use two of options 1-5.

1. Contour buffer strips or contour strip cropping
2. Leave all crop residue and no fall tillage
3. Apply manure in intermittent strips on no more than 50% of the field
4. Apply manure on no more than 25% of the field waiting a minimum of 14 days between applications
5. Reduce manure application rate to 3,500 gals. or 30 lbs. P2O5, whichever is less
6. No manure application within 200 feet of all concentrated flow channels
7. Fall tillage is on the contour and slopes are less than 6%.

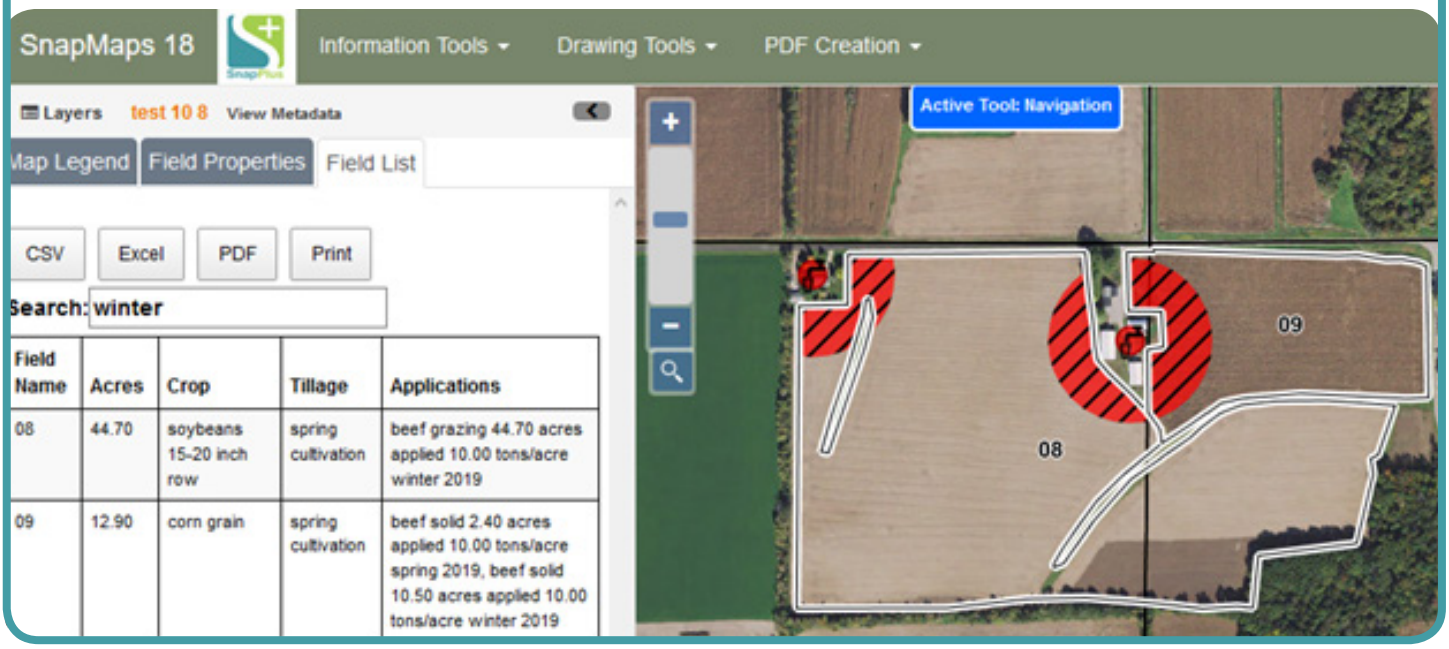
SnapMaps can help with planning winter spreading and other applications

1. **Enter your winter applications in the database and Upload the year to SnapMaps.**

2. **In SnapMaps, check the winter restrictions in the legend.**



3. **Type "winter" in the Field List in SnapMaps to only show the fields with winter applications. Then, print the map, this Field List, and the NM6 Winter Spreading report, to show what to do and where.**



Thanks to our **2018 Quality Assurance Team Members**

Provided plans and reviews and attended the Quality Assurance Team meeting: Mark Weihing-MW Ag Service, Tonya Gratz-Green Co., Laurie Lambert-Dane Co., Sheila Smith-Winnebago Co., Alex Clark-Insight FS, Kayla Smith-Insight FS, Ashley Lorence-UW NPM, Dan Smith-UW NPM, Mimi Broeske-UW NPM, Laura Ward Good-SnapPlus, Sarah Sebrosky-SnapPlus, Rick Wayne-SnapPlus, Joe Wolter-SnapPlus, Jim Beaudoin-SnapPlus, Rachel Rushmann-DATCP, Stephanie Schneider-DATCP, Ryan Erisman-DATCP, Mark Jenks-DATCP, and Sue Porter-DATCP.

Provided plans and reviews: Brian Smetana-Walworth Co., Cathy Cooper-Richland Co., Matt Hanewall-LaCrosse Co., Todd Morris-Green Lake Co., Emily salvinski-Wood Co., Erik Heagle-Grant Co., Nate Leystra-CCA, Landon Baumgartner-Iowa Co., Karen Doyle-Waukesha Co., Harold McElroy-Columbia Co., Charles Sibilsky-Adams Co., Mitch McCarthy-Lincoln Co., Matt Repking-Marathon Co., Amanda Kleiber - Calumet Co., Becky Wagner - Fond du Lac Co., Lee Jennings - Brown Co., Tyler Bushmaker - Outagamie Co., Andy Keifer - Outagamie Co., Scott Frank - Shawano Co., Brian Hanson - Shawano Co., Blake Schuebel - Shawano Co., Travis Engels - Kewaunee Co., Stephanie Egner - Washington Co., Robert Bird - Dodge Co., Travis Drier - Pepin Co., Amanda Peters - Eau Claire Co., Brent Tessmer - Taylor Co., Justin Everson - Barron Co., and Kevin Seng - Door Co.

SnapPlus 18 Brings BIG Improvements

Over the past 12 years, the SnapPlus development team in the UW Madison Soil Science Department has continually improved Wisconsin's software tools for NM planning. Red and orange planning flags are displayed when planned applications do not meet 2015-590 NM Standard and A2809. SnapMaps soils and other layers can be imported into SnapPlus, filling the entire Field screen and enabling planners to easily develop and update plans.

SnapPlus18 improvements:

- **Nutrient System Editor** allows multiple nutrient applications to be combined as a single crop year system. Make your Nutrient System from the main tool bar or in the Nutrient screen. Once you make a nutrient system, you can apply it by selecting "Apply Nutrient System" from any screen where you normally apply fertilizers and manure, including the Rotation Wizard.
- **Bold headed columns** in the Field and Cropping Grid screens allows planners to make groups and change data in selected cells.
- **Copy crop rotations** from the Cropping screen and store them as a rotation in the Rotation Wizard.
- **Merge fields** in the Field screen to merge their geometry too. Multiple fields can be combined into one field within the SnapPlus desktop eliminating the need to redraw the boundaries in SnapMaps.
- **SnapMaps allows** users to: draw polygons around features they want to delete; dismiss inaccurate 1000' SWQMAs; and create thematic field maps showing planned nutrient application rates, soil test levels, and customizable field labels.
- **Calculates spreadable acres** and rates of nutrient applications to parts of a field with spreading restrictions, like setbacks from wells. To make separate applications to a field's **winter-spreadable** and **winter-restricted** areas, be sure to download your maps to the desktop and import the orange highlighted cells from SnapMap Fields and SnapMap Restrictions into the database. You can turn off the highlighting by selecting the Ctrl button and clicking on individual cells or column headers. If a cell is not highlighted, it will not import to the rest of the database.

DATCP-Certified Soil Testing Labs

- A & L Great Lakes Labs (Fort Wayne, IN)
- AgSource Labs (Bonduel, WI)
- Dairyland Labs (Stratford, WI)
- Minnesota Valley Testing Labs, Inc. (New Ulm, MN)
- Midwest Labs Inc. (Omaha, NE)
- Rock River Lab (Watertown, WI)
- UW Soil & Forage Lab(Marshfield, WI)

Additional NM Planning Resources

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

How-to videos available:

- Exporting and Importing Field Info/ Farms/ Subfarms
- How to Create an Excel Document Daily Log and Import it into SnapPlus
- Updating new boundaries in a field using new shapefile
- Dismissing and Restoring a SWQMA in SnapMaps
- Making your Own Customized Map Using the Snipping Tool and Word
- Changing Field Labels in SnapMaps

To see all the version improvements in the SnapPlus desktop application, go to Help > Help Contents > What's New in 18

DATCP offers a variety of in-person trainings. Check the SnapPlus website for scheduled trainings.

DATCP NM Specialists

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DATCP Programs Have Increased NM Acres

Farmland Preservation

The Farmland Preservation (FP) program provides participating landowners income tax credits for keeping their land in agricultural use and complying with Wisconsin's conservation standards, which include nutrient management. In 2018, 13,000 FP participants contributed 1.4 million of the total 3.3 million NM plan acres. FP participants submit their NM Checklists to the county annually. Every four years the county verifies that the farms are meeting nutrient management and other conservation standards.

Landowners are eligible to claim FP tax credits if their land is located in:

1. A farmland preservation zoning district or
2. An agricultural enterprise area (AEA) and is covered by a FP agreement.

New opportunities for eligibility

Local governments are creating more opportunities for landowners to claim the tax credit by:

- Expanding the FP zoned areas to more than 5.8 million acres.
- Adding AEAs to cover about 1.3 million acres enabling more landowners to sign FP agreements, which currently total about 750.

If you want to learn more about participating in FP, please contact your county land conservation department.

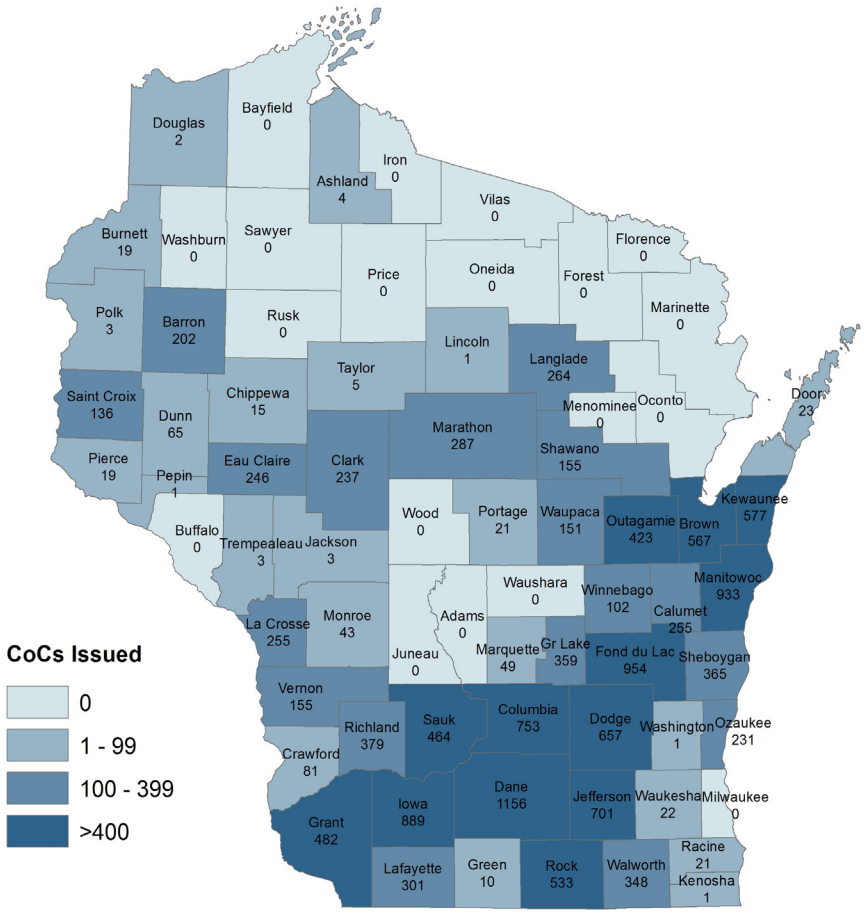

Figure 5 Number of Certificates of Compliance (COCs) issued for Farmland Preservation participants by the county conservation department.

2018 County NM Plan Coverage

Reported in thousands of acres

Most acreage reported

Fond du Lac -184, Marathon-169, Dane -157, Manitowoc-155, Dodge-141, Brown-140, Clark-125, Outagamie-120, Shawano and Jefferson-117, Rock-113, Kewaunee-108, and Columbia-101

Greatest increase in acres from 2017 to 2018

Trempealeau-34, Fond du Lac - 28, Sauk-21, Clark-17, Saint Croix-16, Shawano-14, Walworth-16, Richland-12, Pepin-9, Columbia-6, Buffalo-6, Marathon-5, Wood-5, Vernon-4, Grant-4, Oneida-4, Brown-4, Taylor-3, Winnebago-3, Door-2, Marquette-2, Pierce-2, Chippewa-2, Portage-1, Iowa-1, Adams-1, Washington-1, Waukesha-1, Burnett-1, Lafayette-1, Ashland-1, Juneau-1, Lincoln-0.4, Calumet-0.4, Barron-0.3, Sawyer-0.2, and Sheboygan-0.1.

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For more information:
https://datcp.wi.gov/Pages/Programs_Services/NutrientManagement.aspx