



Wisconsin Nutrient Management

where food, land, and water meet

WDATECP

What's in a 590 Nutrient Management Plan?

- Follows USDA NRCS WI **590** Standard and UWEX Pub. **A2809** *Nutrient application guidelines for field, vegetable, and fruit crops in Wisconsin* **to protect farm profitability, water, and soil** with nutrient application requirements
- Accounts for **ALL** N-P-K nutrient applications for the crop rotation showing adequate acreage for manure
 - nutrients shall not run off the field during or immediately after application
 - Annually update NM plan when things change with all crops, nutrients, and tillage used
- Soil test sample every 5 acres every 4 years using a DATCP certified lab.
 - Labs not certified are using different test methods with different results that can NOT be compared to WI soil testing procedures or used in SnapPlus.

Soil test – nutrient credits = fertilizer to apply

DATCP Certified Soil Testing Laboratories

1. A&L Great Lakes, Fort Wayne IN
2. AgSource, Bonduel WI
3. Dairyland, Arcadia WI
4. MVTL, New Ulm MN
5. Rock River, Watertown WI
6. UW-Madison Soil & Forage Analysis, Marshfield WI

All these labs are Manure Analysis Proficiency program participants

Percent of County Cropland with 2016 NM Plans

Calculated from county reported acres and the National Ag Statistics Service county cropland 2012

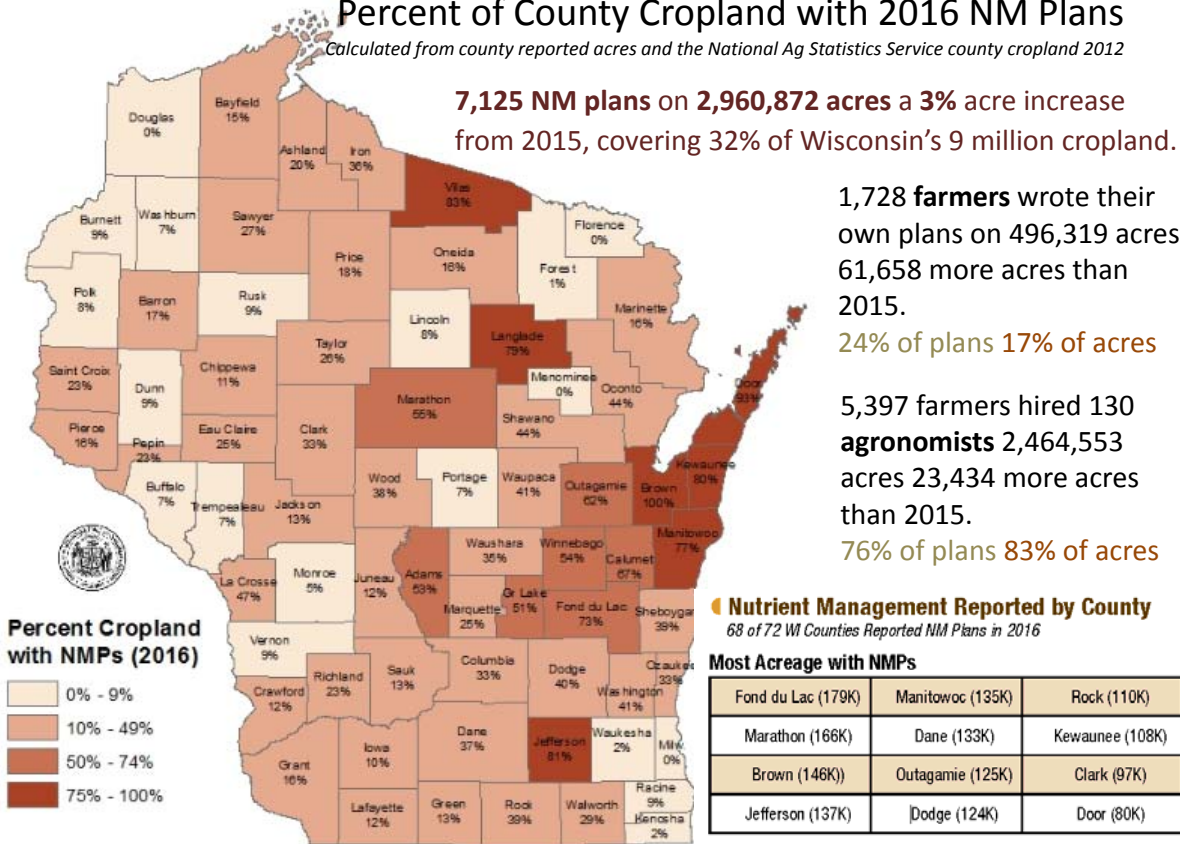
7,125 NM plans on 2,960,872 acres a 3% acre increase from 2015, covering 32% of Wisconsin's 9 million cropland.

1,728 farmers wrote their own plans on 496,319 acres 61,658 more acres than 2015.

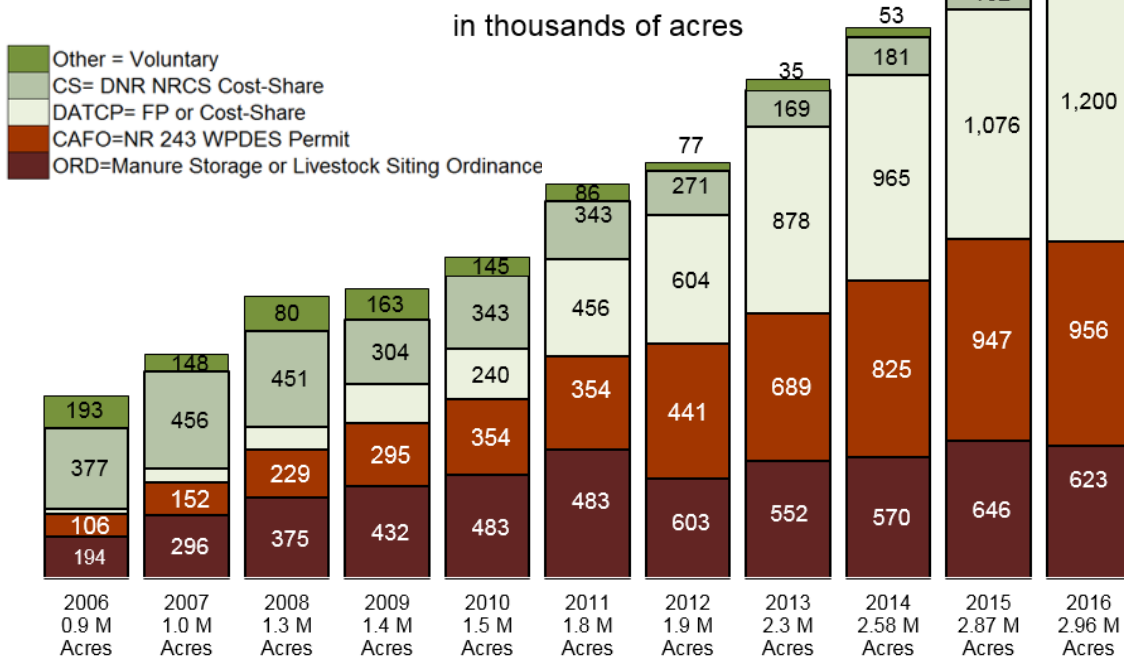
24% of plans 17% of acres

5,397 farmers hired 130 **agronomists** 2,464,553 acres 23,434 more acres than 2015.

76% of plans 83% of acres



2006-2016 Nutrient Management Plan Acres Reported by Program



NM Implementation Trends

DATCP certified soil testing labs 5 year summary:

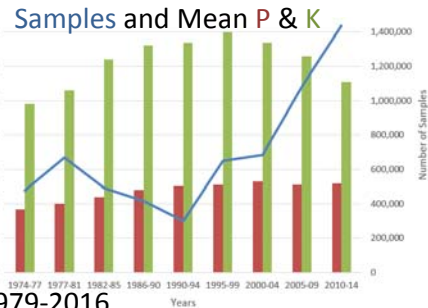
2010-2014 **Mean 52 ppm soil test P**

2005-2009 **Mean 51 ppm soil test P**

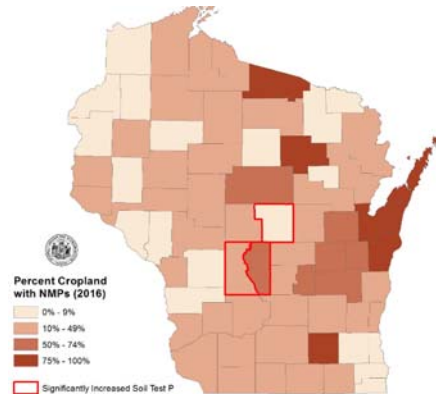
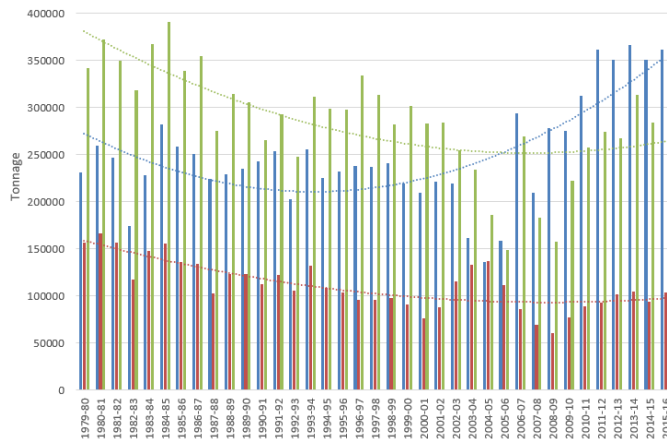
1995-2014 **30** counties had a significant **decrease** in soil test P and **39** counties had **no change**.

Adams, Portage, and Juneau counties had a statistically significant **upward** linear trend in median soil test P. The change in mean difference of samples increased 200%.

1974 to 2014 Soil Tests



Tons of **Nitrogen-Phosphate-Potash** Fertilizer Consumed 1979-2016



ATCP 50 Wis. Admin. Code

Describes how farms may be required to do **NM** with a cost share \$ offer or without cost share if:

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

DATCP Home > Manure Storage Ordinances
Manure Storage Ordinances

Counties with Manure Storage Ordinances



Towns and counties may adopt ordinances to regulate manure storage structures. The Wisconsin Department of Natural Resources oversees these local regulations. Chapter 92, DATCP's administrative rule ATCP 50.04, requires local governments to submit manure storage ordinances to DATCP for review, but DATCP applies to counties with significant agricultural activity have ordinances.

Manure storage ordinances listed by county

Other Local Ordinances

Counties and towns may also require conservation easements on farms. DATCP and the Department of Natural Resources oversee these local regulations if they exceed state agricultural standards.

Local governments may regulate new and existing

Wisconsin "Right to Farm Law"

Protects farmers conducting ordinary farming practices from legal action as nuisances. s. 823

Exceeding state standards ATCP 50.04 is only allowed if approved by either DATCP or DNR. A local governmental unit is responsible for analyzing the legal adequacy of its regulations.

A person may challenge a local regulation at the local level and in court if the person believes that the local governmental unit has violated state standards in NR 151 and ATCP 50.

Livestock Facility Siting Ordinance

provides uniform regulation of livestock facilities requiring compliance with the state standards. s. 93.90 and ATCP 51.12-51.20

ATCP 51 Livestock Siting Ordinance

Livestock Siting Authority Info

Authority: Green County

Ordinance Type: Zoning

Permit Threshold in Animal Units:
500

Ordinance Name: Zoning Ordinance
Section 4

County: Green

Date Enacted: 11/14/2006

Email: Todd.Jenson@wi.nacdn.net

Website: <http://www.co.green.wi.gov/>

— Livestock Siting Permits

-  1 - 500 Animal Units
-  501 - 1000 Animal Units
-  > 1000 Animal Units

— Livestock Ordinances

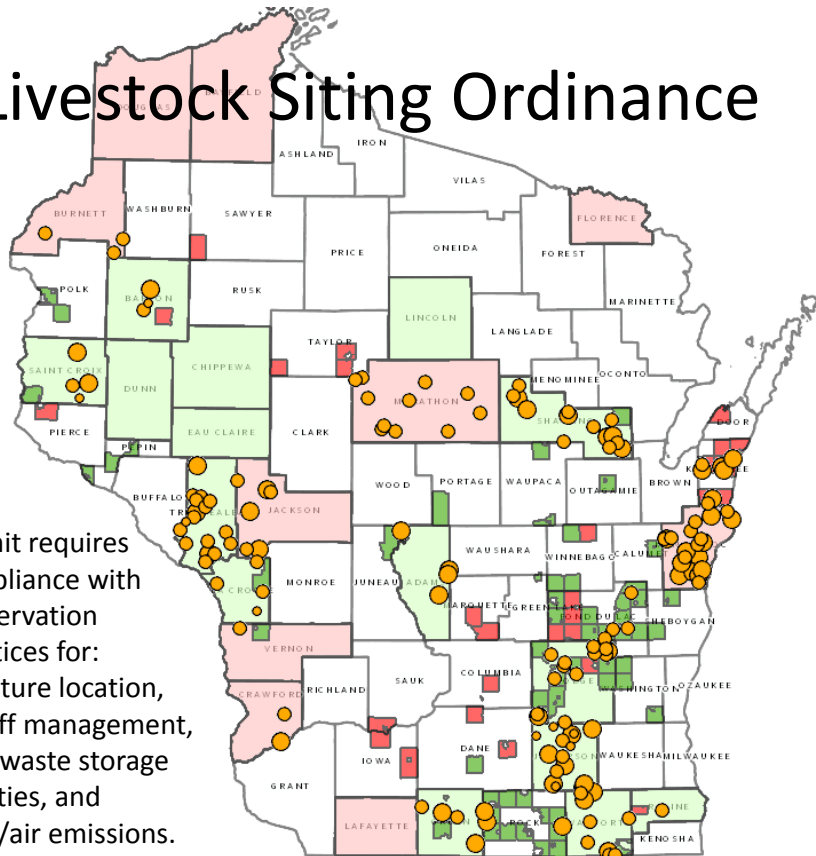
— Town or City Ordinance

-  Zoning
-  Licensing

— County Ordinance

-  Zoning
-  Licensing

Permit requires compliance with conservation practices for: structure location, runoff management, NM, waste storage facilities, and odor/air emissions.



Why ATCP 50 Admin. Code Changes?

1. Provides farm conservation practices for implementing NR 151. Replacing 2005 Nutrient Management (NM) 590 Standard with 2015-590 NM Std. Increases cost share from \$7 to \$10/ac times 4 years \$28/ac to \$40/ac for those yet to plan.
2. Clarifies the NM phosphorus (P) strategy alternative to the PHOSPHORUS INDEX performance standard is managing the SOIL TEST P consistent with 2005 and 2015-590 NM Stds. CAFOs use both P strategies. CAFOs are not required to follow the current PI performance standard in NR 151.04.
3. Requires NM planners to follow ATCP 50.04(3). Complete a NM plan Checklist, substantiate responses, and provide to DATCP or DATCP's agent if requested.
4. Prevents a conflict of interest for a privately owned DATCP certified soil testing laboratory to not perform soil test analysis on cropland managed or owned by a person managing or having a substantial financial interest in the laboratory.
5. Clarifies that a local manure storage ordinance may include provisions to monitor the adequacy of manure storage systems including the annual submission of a NM plan that complies with ATCP 50.04(3).

590 Changes Surface water and groundwater protection



- Control soil erosion. When applying **manure** or organic by-products use either P strategy **during the crop rotation** of 8 yrs. or less:
 - Phosphorus **P Index** ≤ 6 or
 - Manage the **Soil Test P**, balance **STP** 50-100, draw down when is >100 PPM
- No applications within 50' of direct conduits to groundwater unless deposited by gleaning or pasturing animals or as corn starter fertilizer.
- Do not apply to areas locally delineated by the Land Conservation Committee or in a conservation plan as areas contributing runoff to direct conduits to groundwater unless manure is substantially buried within 24 hours
- New: Provides methods for rescue N applications and refining NM recommendations through on-farm research using 590's Technical Note Appendix 3, Guidelines for Adaptive Nutrient Management
- New: Do not apply to areas near public water supplies unless manure is treated to substantially eliminate pathogens. Area within:
 - 1000' of a **Community potable water well** = **30,000** [0.3%] cropland acres; or
 - 100' of a **Non-community potable water well** = **~ 7,000** [0.1%] cropland acres (church, school, restaurant, taverns, etc....)

Total Cropland Data Layer 2015, 2014 NASS with grass/pastures fields = 11,866,674 crop acres 9

590 criteria for surface water protection



Nutrients Applied In **Surface Water Quality Management Area**

(**SWQMA**) 1000' from ponds or lakes = **1.33 M** [11%] cropland acres and
300' from rivers or streams = **0.5 M** [4%] cropland acres

In fall, spring, summer use 1 or more of the following:

- Effective incorporation within 72 hours of application
- Establish crops prior to, at, or promptly following application
- Install/maintain vegetative buffers or filter strips
- Maintain $\geq 30\%$ cover after nutrient application
- Apply nutrients within 7 days of planting on fields with $< 30\%$ cover and have 3 or more consecutive years of no-till example corn silage
- In the **SWQMA** or where subsurface drainage is present limit mechanical applications of unincorporated liquid manure with 11.0% or less dry matter to 12,000 gals/acre. Sequential applications may be made to meet the nutrient need waiting at least 7 days between applications. Visually monitor accessible tile outlets before, during, and after applications for discharge of liquid manure or organic by-product. If a discharge is observed, stop applications.

Winter - when temperature/snow prevents effective incorporation:

- Do not **mechanically** apply nutrients within the **SWQMA**; but gleaning or **pasturing** animals are allowed in **SWQMA** and on all slopes in winter while following 590.



590 Protecting surface and ground water

Winter, when temperature or snow prevents effective incorporation:

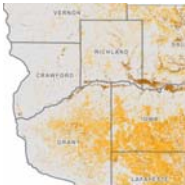
No commercial N or P fertilizer application except on pastures and winter grains.

Farms mechanically applying **manure** or organic by-products must have a Winter Spreading Plan: amount available storage, winter applied, or generated in 14 days, whichever is greater.

- Do not exceed the P removal of the following growing season's crop. Limit liquid manure applications to 7,000 gal/acre. All winter manure applications 60 lbs. of P2O5/ac or less. **New:**
- Do not apply within **300 feet** of direct conduits to groundwater.
- Do not surface apply **liquid manure during February and March** on:
 - DNR Well Compensation** areas funds provided to replace wells when contaminated with livestock manure = **6,400 [0.1%] cropland acres** or
 - Silurian dolomite within 60 inches** of soils surface = **83,500 [1%] cropland acres.**
- Do not apply **where concentrated flow channels are present** (options 1.- 7) or on **slopes > 6%** (C,D,E,F options 1.- 5.) = **3.1 M [26%]** unless 2 practices are used:

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

11



590 criteria for groundwater protection

New: Nitrogen (N) restricted soils limit N applications to A2809 and these 590 rates for all N sources to reduce leaching.

- Late summer or fall **commercial N fertilizer rates** on fall seeded crops or commercial fertilizers blends needed, Pub. A2809. Do not exceed **36 lbs. N/ac.** on these features:

(P) **high permeability soils** = 1.3 M [11%] cropland acres] Use 1 of 3 practices to reduce **spring** leaching

(R) **rock soils** with less than 20 inches to bedrock = 235,000 [2%] cropland acres]

(W) **wet soils** with less than 12 inches to apparent water table = 1.5 M [13%] cropland acres]

Soil depth 5 feet or less over bedrock = 1.8 M [15%] cropland acres]

Within 1,000 feet of a community well = 30,000 [0.3%] cropland acres] All = 4.7 M [39%] cropland acres

- Late summer or fall **manure or organic by-products rate limits** do not smother crops:

Use ≤ 120 lbs. available N/acre

P & R soils on all crops, except annual crops.

Additionally, manure with ≤ 4% DM wait until after soil temp. < 50°F or Oct. 1 use either a nitrification inhibitor or leave on surface for 3 days.

W soils or combination W soils on all crops.

Additionally, manure with ≤ 4% DM on all crops use at least 1 of 5 practices:

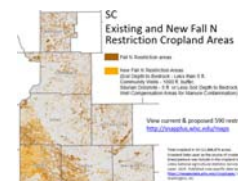
- Use nitrification inhibitor.
- Apply on an established cover crop, an overwintering annual, or perennial crop.
- Establish a cover crop within 14 days of application.
- Surface apply and do not incorporate for at least 3 days.
- Wait until after soil temp. < 50°F or Oct. 1.

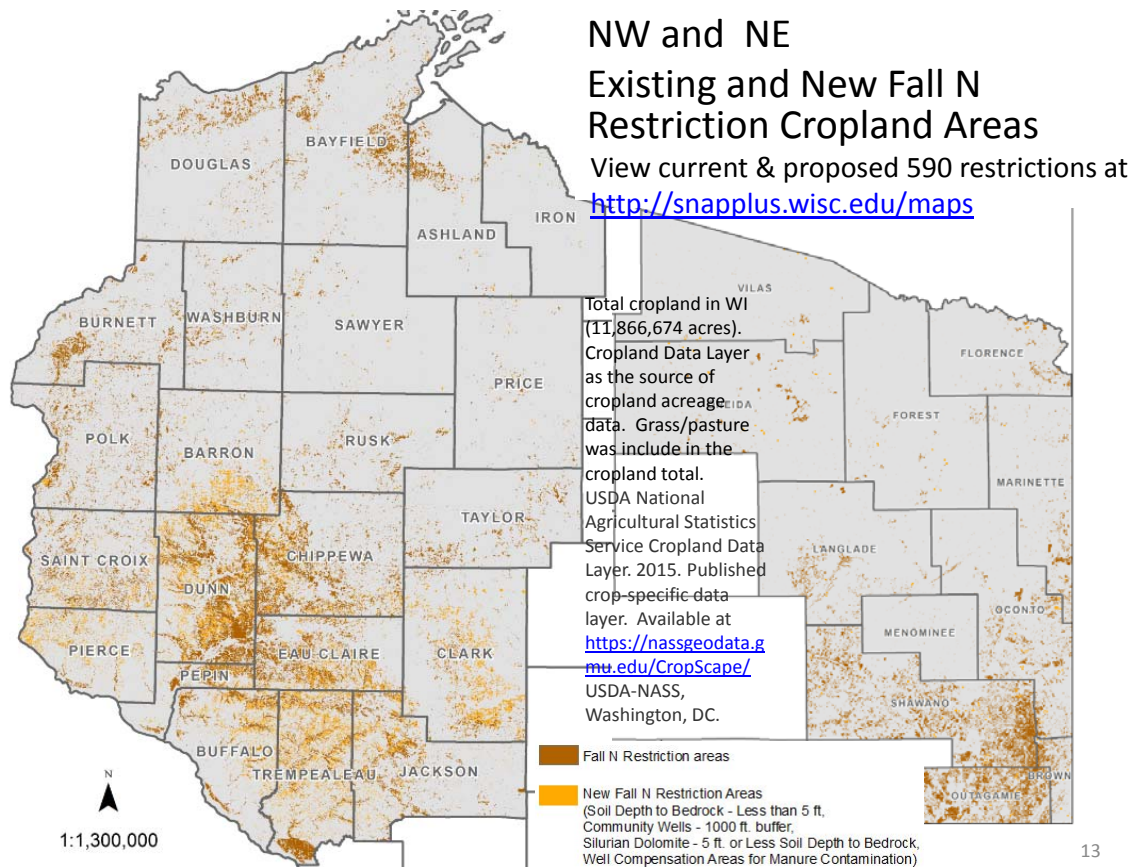
Use ≤ 90 lbs. available N/acre

P & R soils wait until after soil temp. < 50°F or Oct. 1 on annual crops.

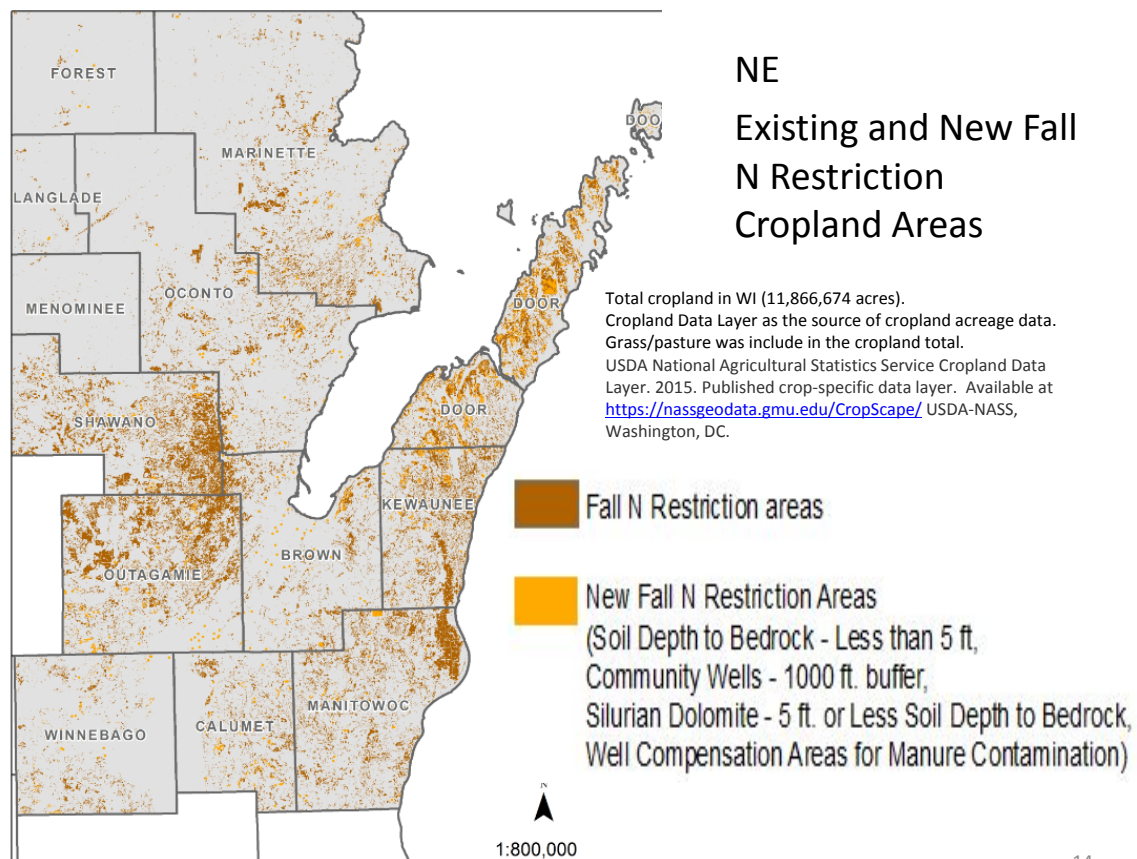
Additionally, manure with ≤ 4% DM on all crops use either a nitrification inhibitor or leave on surface for 3 days.

W soils or combination W soils ≤ 4% DM on all crops.

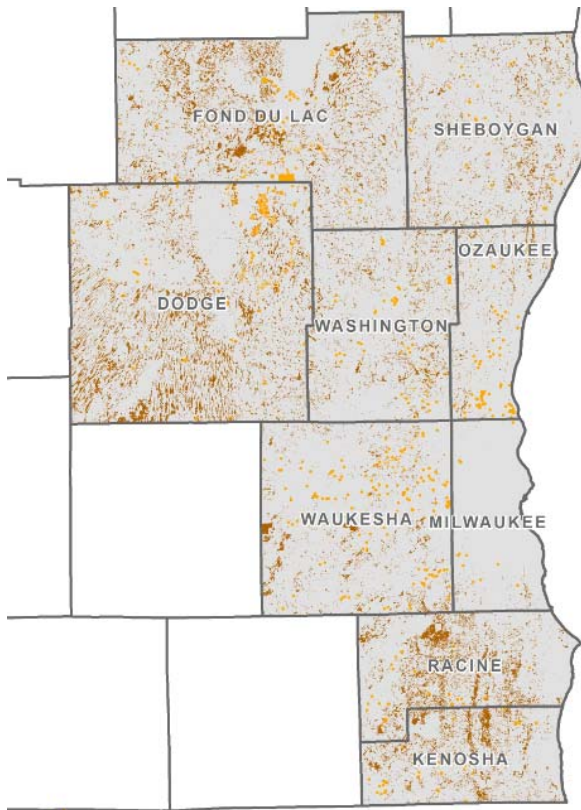




13



14



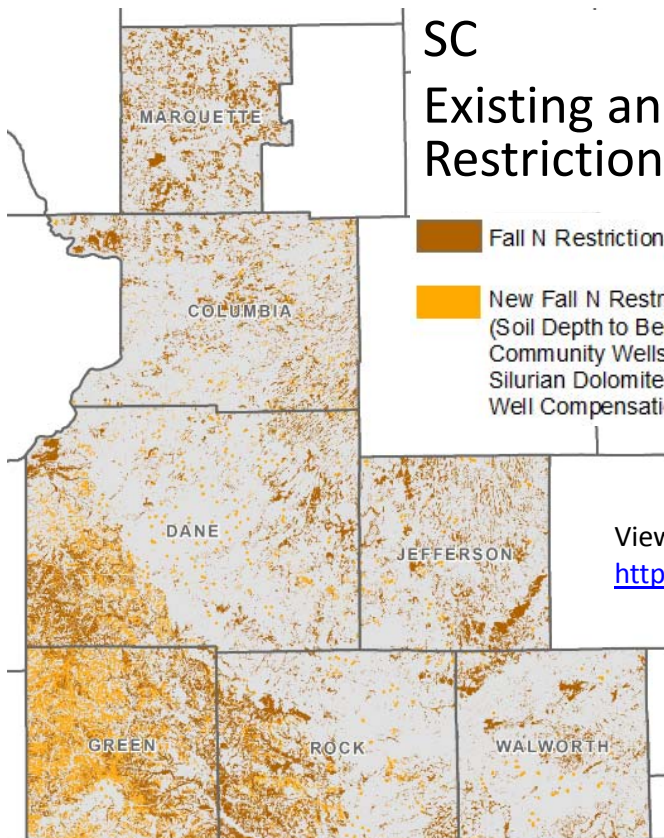
SE Existing and New Fall N Restriction Cropland Areas

Total cropland in WI (11,866,674 acres).
Cropland Data Layer as the source of cropland acreage data. Grass/pasture was include in the cropland total.
USDA National Agricultural Statistics Service Cropland Data Layer. 2015. Published crop-specific data layer.
Available at <https://nassgeodata.gmu.edu/CropScape/>
USDA-NASS, Washington, DC.

View current & proposed 590 restrictions at
<http://snapplus.wisc.edu/maps>

- Fall N Restriction areas
- New Fall N Restriction Areas
(Soil Depth to Bedrock - Less than 5 ft,
Community Wells - 1000 ft. buffer,
Silurian Dolomite - 5 ft. or Less Soil Depth to Bedrock,
Well Compensation Areas for Manure Contamination)

15



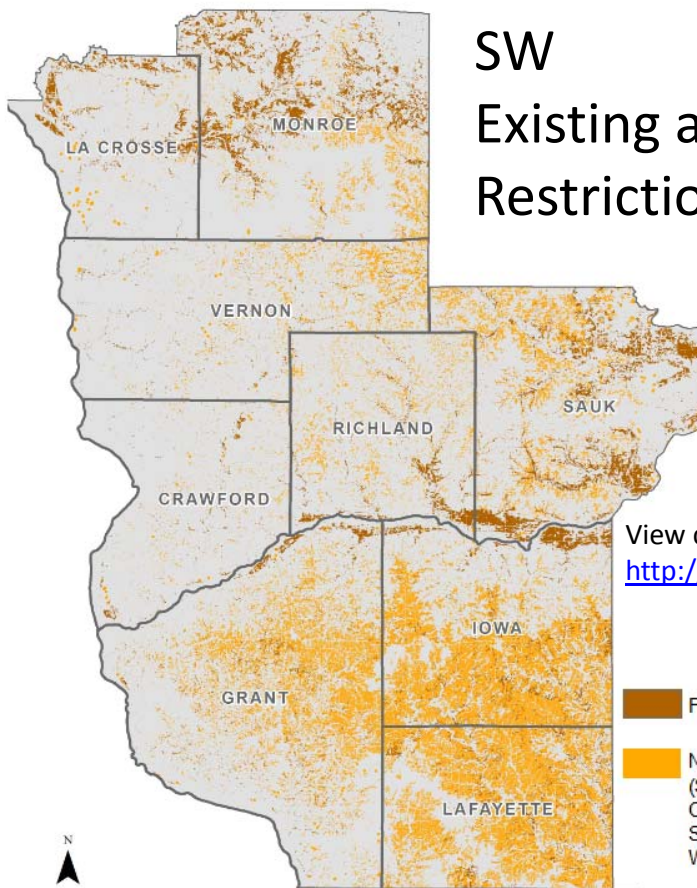
SC Existing and New Fall N Restriction Cropland Areas

- Fall N Restriction areas
- New Fall N Restriction Areas
(Soil Depth to Bedrock - Less than 5 ft,
Community Wells - 1000 ft. buffer,
Silurian Dolomite - 5 ft. or Less Soil Depth to Bedrock,
Well Compensation Areas for Manure Contamination)

View current & proposed 590 restrictions at
<http://snapplus.wisc.edu/maps>

Total cropland in WI (11,866,674 acres).
Cropland Data Layer as the source of cropland acreage data.
Grass/pasture was include in the cropland total.
USDA National Agricultural Statistics Service Cropland Data Layer. 2015. Published crop-specific data layer. Available at <https://nassgeodata.gmu.edu/CropScape/> USDA-NASS, Washington, DC.

16

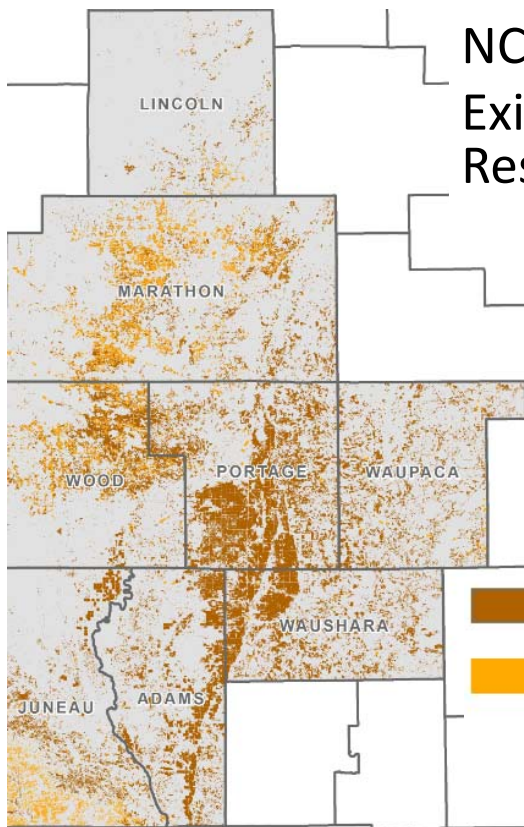


SW Existing and New Fall N Restriction Cropland Areas

Total cropland in WI (11,866,674 acres).
Cropland Data Layer as the source of cropland acreage data.
Grass/pasture was include in the cropland total.
USDA National Agricultural Statistics Service Cropland Data
Layer. 2015. Published crop-specific data layer. Available at
<https://nassgeodata.gmu.edu/CropScape/> USDA-NASS,
Washington, DC.

View current & proposed 590 restrictions at
<http://snapplus.wisc.edu/maps>

- Fall N Restriction areas
- New Fall N Restriction Areas
(Soil Depth to Bedrock - Less than 5 ft,
Community Wells - 1000 ft. buffer,
Silurian Dolomite - 5 ft. or Less Soil Depth to Bedrock,
Well Compensation Areas for Manure Contamination)



NC Existing and New Fall N Restriction Cropland Areas

Total cropland in WI (11,866,674 acres).
Cropland Data Layer as the source of cropland
acreage data. Grass/pasture was include in
the cropland total.
USDA National Agricultural Statistics Service
Cropland Data Layer. 2015. Published crop-
specific data layer. Available at
<https://nassgeodata.gmu.edu/CropScape/>
USDA-NASS, Washington, DC.

View current & proposed 590 restrictions at
<http://snapplus.wisc.edu/maps>

- Fall N Restriction areas
- New Fall N Restriction Areas
(Soil Depth to Bedrock - Less than 5 ft,
Community Wells - 1000 ft. buffer,
Silurian Dolomite - 5 ft. or Less Soil Depth to Bedrock,
Well Compensation Areas for Manure Contamination)

Proposed 590 Restrictions

<http://snapplus.wisc.edu/maps>

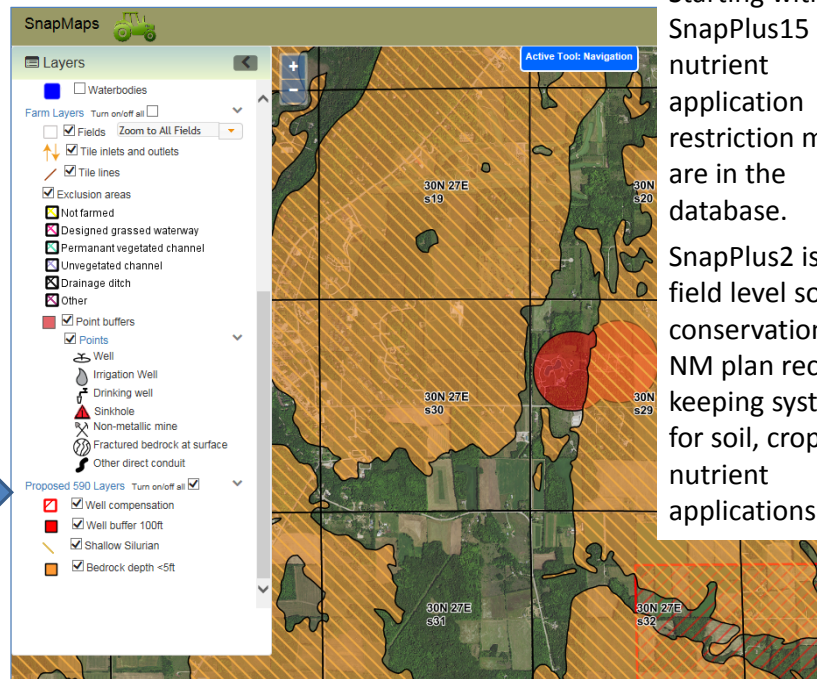
FTP layers for GIS available

Starting with SnapPlus15 - 590 nutrient application restriction maps are in the database.

SnapPlus2 is a field level soil conservation and NM plan record keeping system for soil, crops, and nutrient applications.

1. Search
2. Zoom
3. View

Check the Proposed 590 Layers Box



19

Meeting Tolerable Soil Loss Levels

1. Restart the rotation in 2015 and plan forward up to 8 years with tillage and crops they can use.
2. With alfalfa after 3 years use the crop "alfalfa grassy 3 yrs plus" because it does get grassy and controls more erosion. SnapPlus "alfalfa" means pure stand of alfalfa with no grass.
3. Contour when you can.
4. Try no-tilling the first crop after alfalfa.
5. Try one less tillage pass than usual.
6. Surface apply manure.
7. No-till corn and soybeans or stop growing soybeans on fields with low T.
8. Maintaining good pastures can be a good option for some farms.
9. Double crop corn silage and winter rye with as little tillage as possible.
10. If the critical soil is a now a complex, try picking the other soil.

County	Soil map symb	Soil series name	590 Fall N restrictio ns	CAFO manure prohibitio	Default slope	Default slope length	Soil Loss Tolerance: T ton/a/yr	Soil Erodibility. K Factc	Erosion Sensitivity Index
Dane	1180D2	DUNBARTON	r	r	16	100	1	0.49	1.3906
Dane	1180D2	NEWGLARUS	r	r	16	100	2	0.43	0.6102

Quality Assurance Team Reviews % of Plans Following 590

60 plans covering
31,167 acres

2009 to 2016

The Good

N Soils 55% to 94%

SWQMAs 45% to 92%

Rotational P management
55% to 76%

Meeting T 80% to 72%

**Protected flow channels
with perennial cover from
gully erosion** 50% to 72%

The Ugly

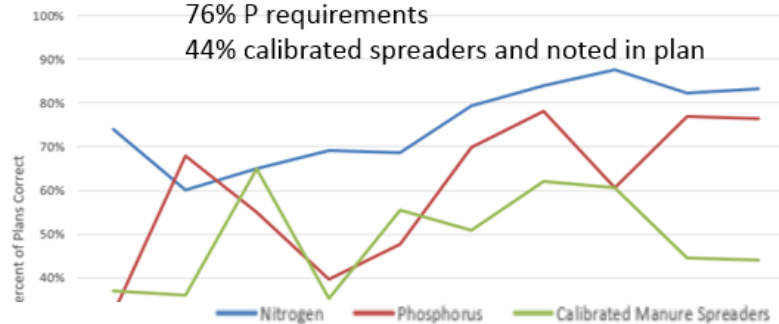
**Calibrated manure
spreaders** 65% to 44%

UW Recs and Spreaders

80% plans followed N

76% P requirements

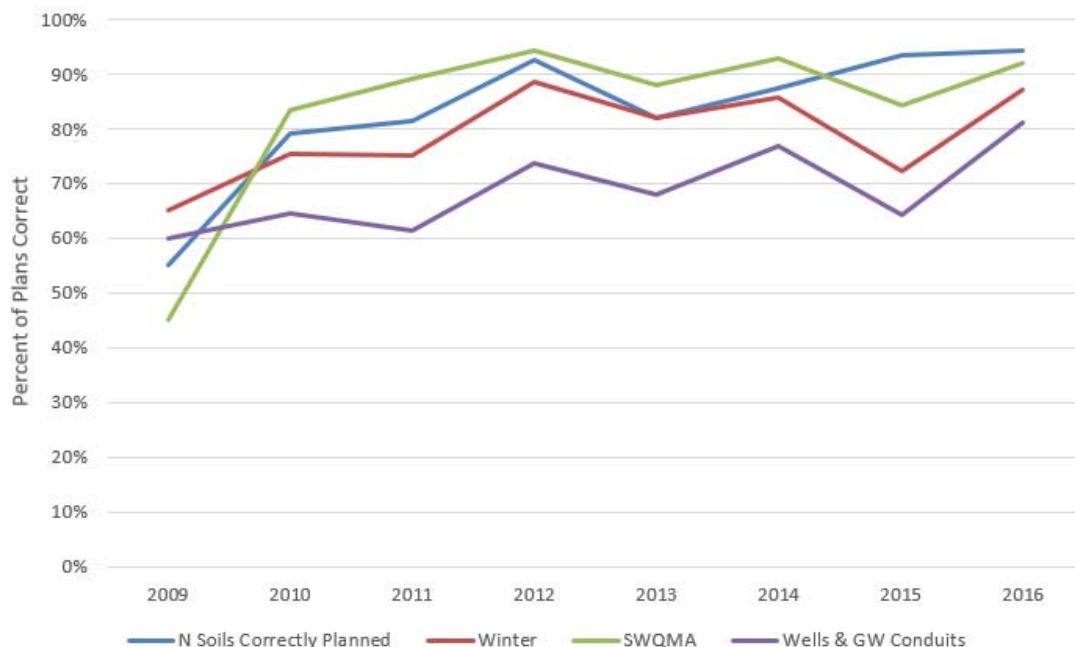
44% calibrated spreaders and noted in plan



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	
							<none> Spreader weight / area Spreader load(s) / area Manure density X volume / area Custom application	

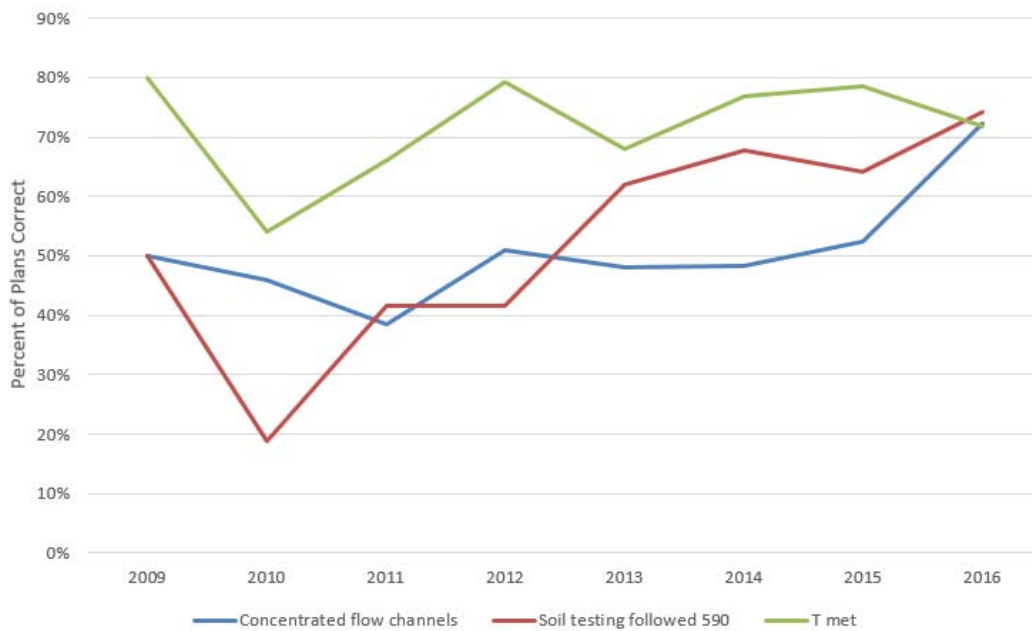
590 Map Restriction

80-94% of the 2016 NM plans followed restrictions



Soil Erosion and Tests

72% controlled erosion and tested accordingly



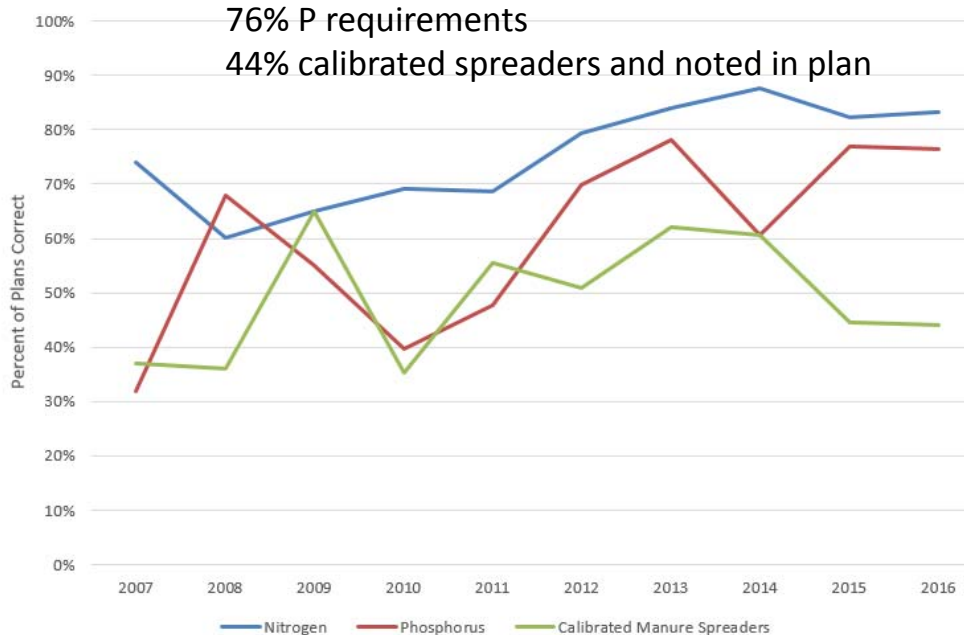
23

UW Recs and Spreaders

80% plans followed N

76% P requirements

44% calibrated spreaders and noted in plan



24