Improved Nutrient Management and Conservation Planning

- Nutrient Management Plan Reporting and Review - managing fields to ***maximize*** profitability and ***minimize*** runoff risks
- Working Lands Initiative - tax credits for conservation & protecting farmland
- Snap Plus Software & Maps - a field record keeping system for past and present crops and applications

Sue.Porter@wi.gov WDATCP 608-224-4605

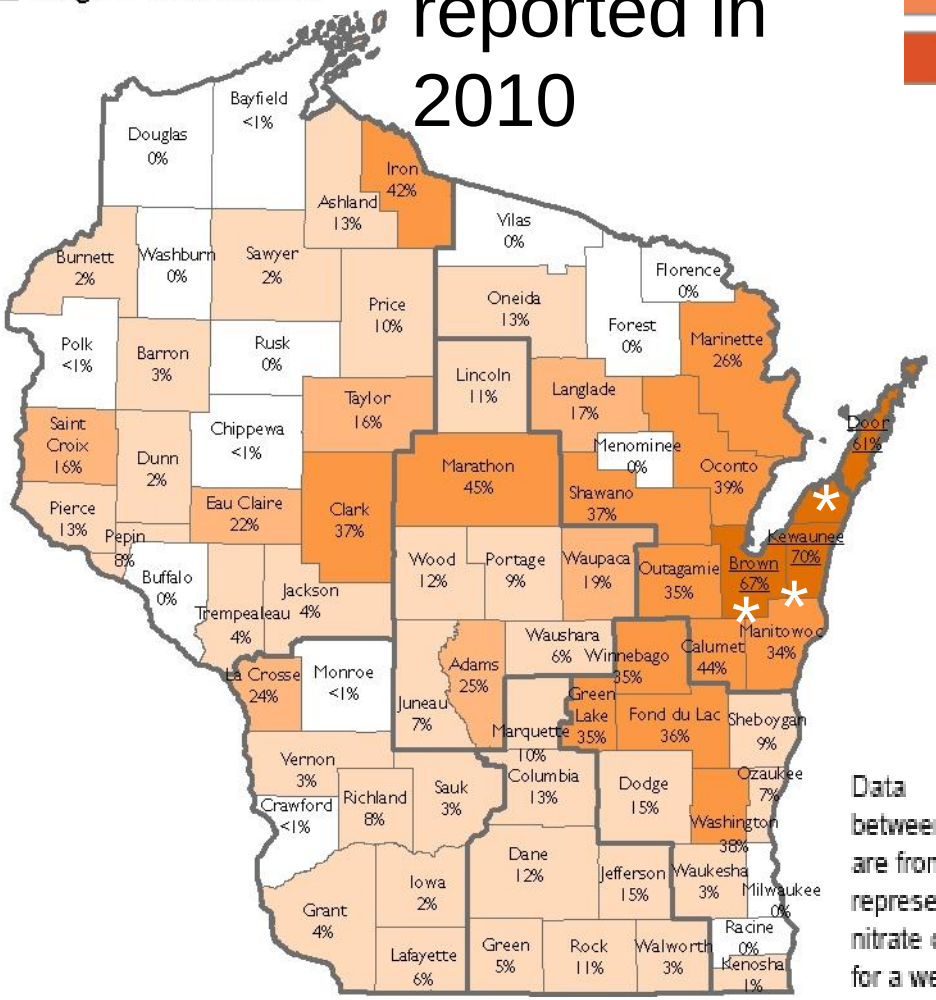
When Are Producers Required to Have a Nutrient Management Plan?

- When participating in **Working Lands Initiative** (**farmland preservation, PACE,** or **AEA**)
- When offered **cost-share for NM**
- When accepting **manure storage cost-share**
- When regulated under a **county** manure storage or livestock siting **ordinance**
- When regulated under a DNR **WPDES** permit
- When required to prevent or **mitigate imminent harm** to waters of the state as an emergency or interim response to a grossly negligent pollution discharge

Percentage of Cropland Reported from NM Plan Checklists 2010

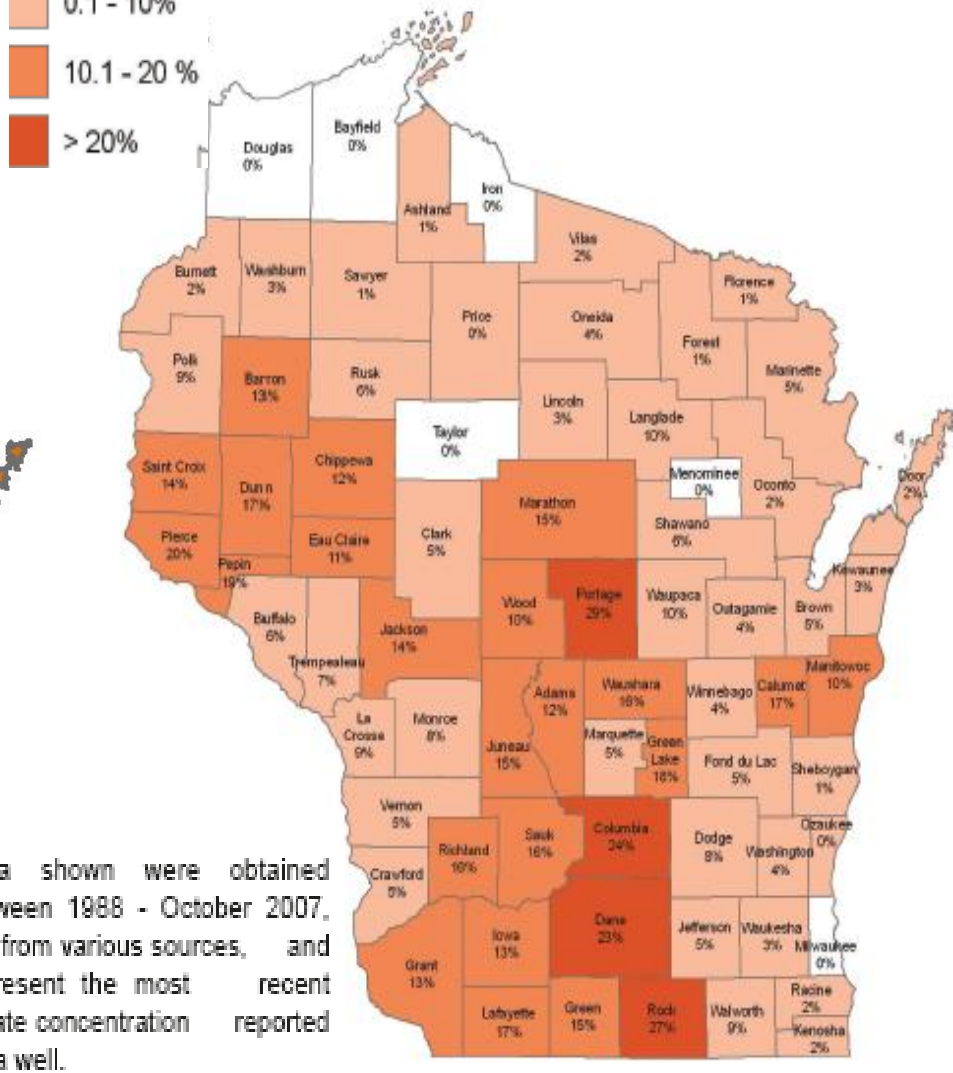
- < 1
- 1 - 15
- 16 - 25
- 26 - 50
- * > 50
- Region Boundaries

1.5 million acres NM plans reported in 2010



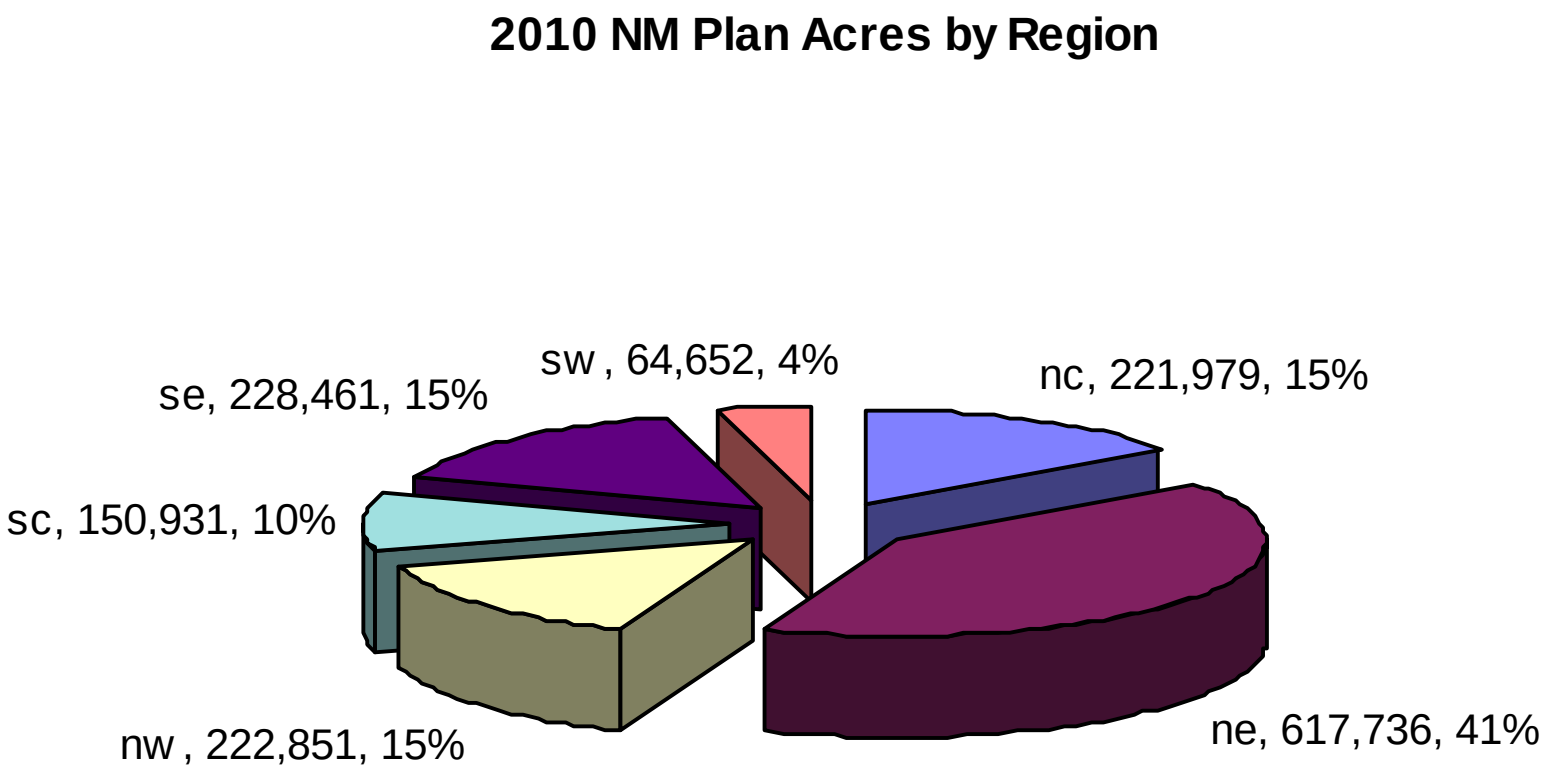
% of Drinking Wells Exceeding the Health Std. 10 PPM Nitrate-N

- 0%
- 0.1 - 10%
- 10.1 - 20 %
- > 20%



Data shown were obtained between 1988 - October 2007, are from various sources, and represent the most recent nitrate concentration reported for a well.

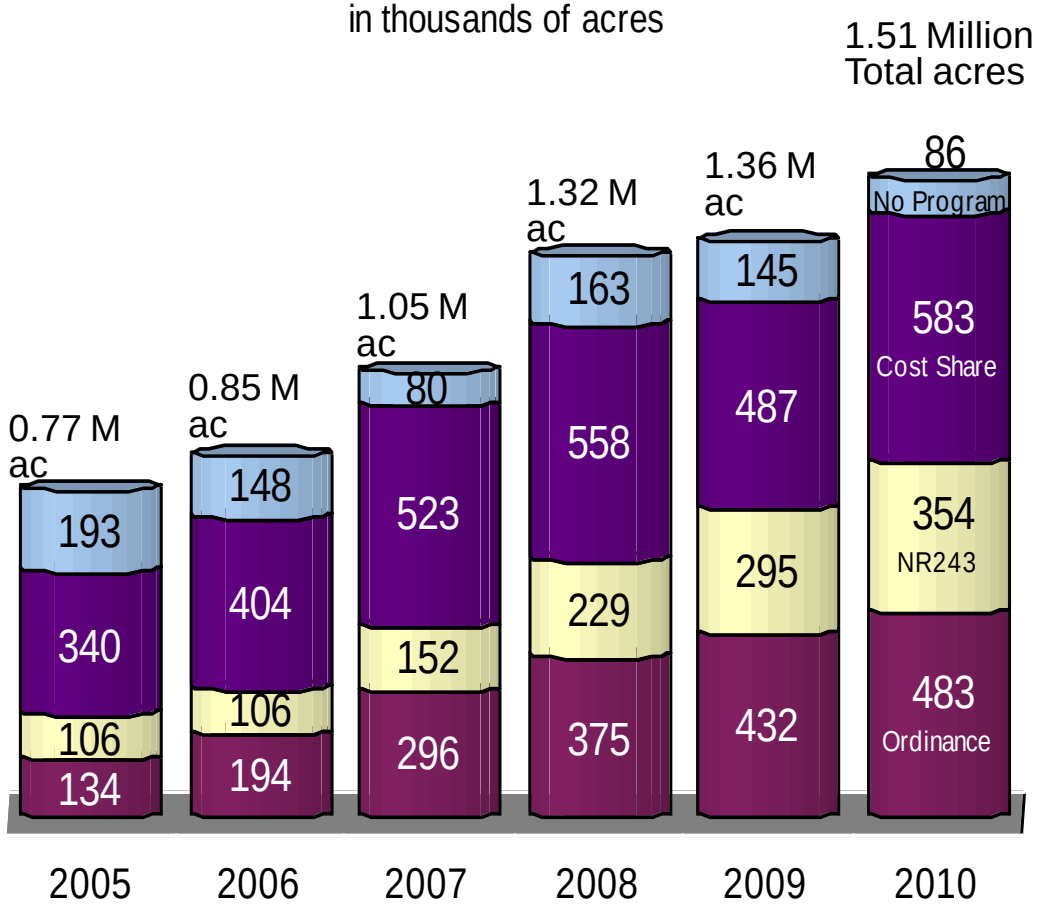
NM Planning has increased



Compared to 2009, NM planning has increased in every region of WI by: 20% in the south east; 15% in the south central; 14% in the north central; 11% in the north east; 8% in the north west; and 1% in the south west.

2010 Nutrient Management plans cover ~ 17% of WI cropland

- 695 farmer wrote their own plans on 204K ac 77 more farmers than last year
- 2383 agronomist written plans (77%)
- 81% of plans reviewed were written in Snap Plus computer software developed & maintained by UW Soil Science & DATCP, a 6% increase from last year

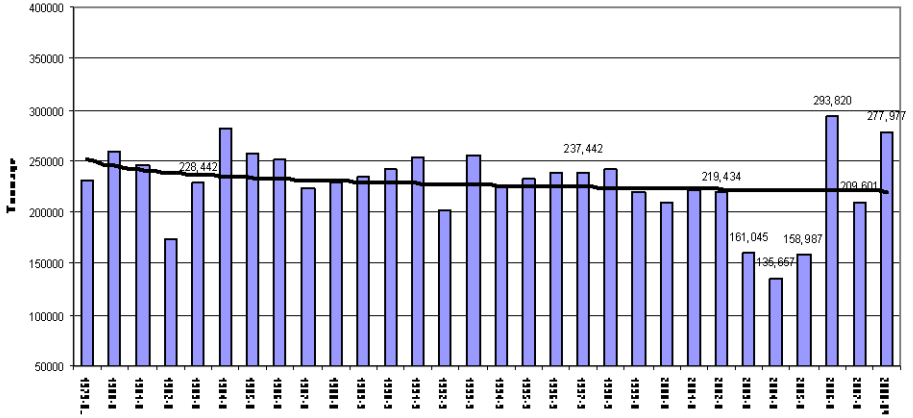


Snap Plus allows the farms to keep cropping records, calculate soil loss, estimate fertilizer costs, and manage to the 590 standard

Fertilizer Tonnage Reporting 1980-2009

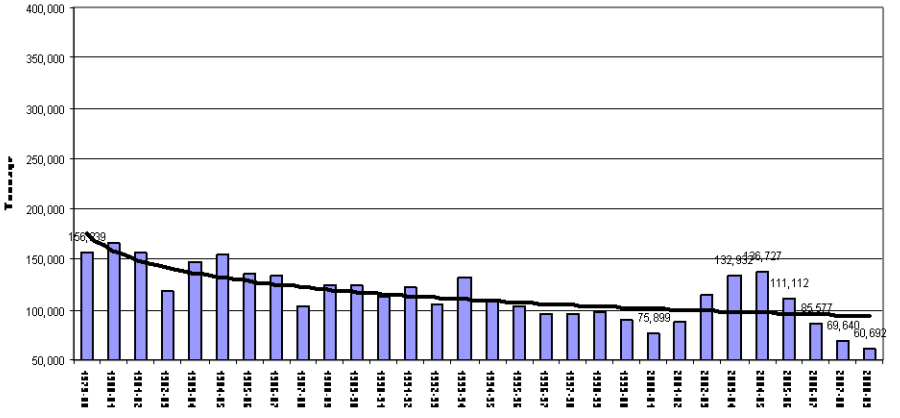
Commercial Nitrogen Consumption

2008-09 0.28 million tons



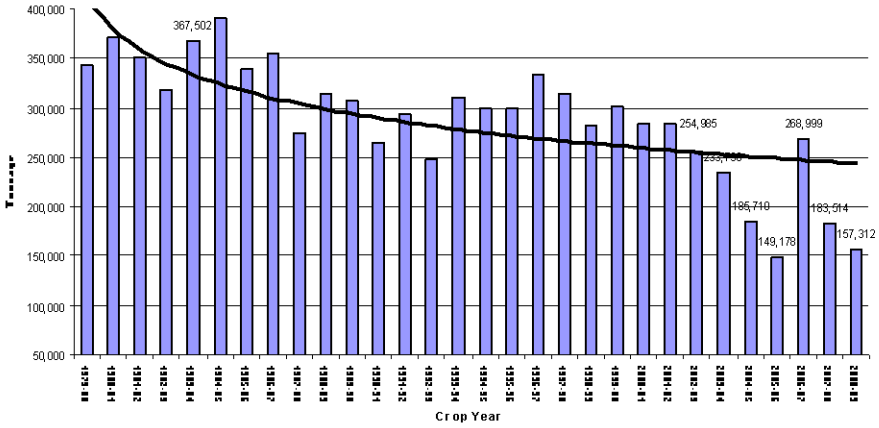
Commercial Phosphates Consumption

2008-09 0.06 million tons



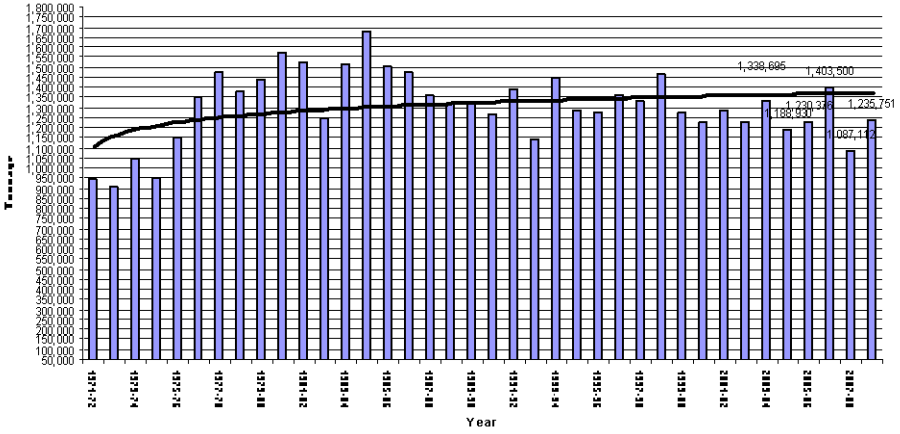
Commercial Potash Consumption

2008-09 0.16 million tons



WI Reported Fertilizer Tonnage

2008-09 1.2 million tons



Working Lands Initiative

Farmland Preservation Program
Agricultural Enterprise Areas
Purchase of Agricultural Conservation Easement

Agriculture is a $59 billion annual business responsible for more than 10% of jobs in the state, so it's essential that we protect our working lands

Effective July 1, 2009

Working Lands Initiative brings $27M to participating WI farmers

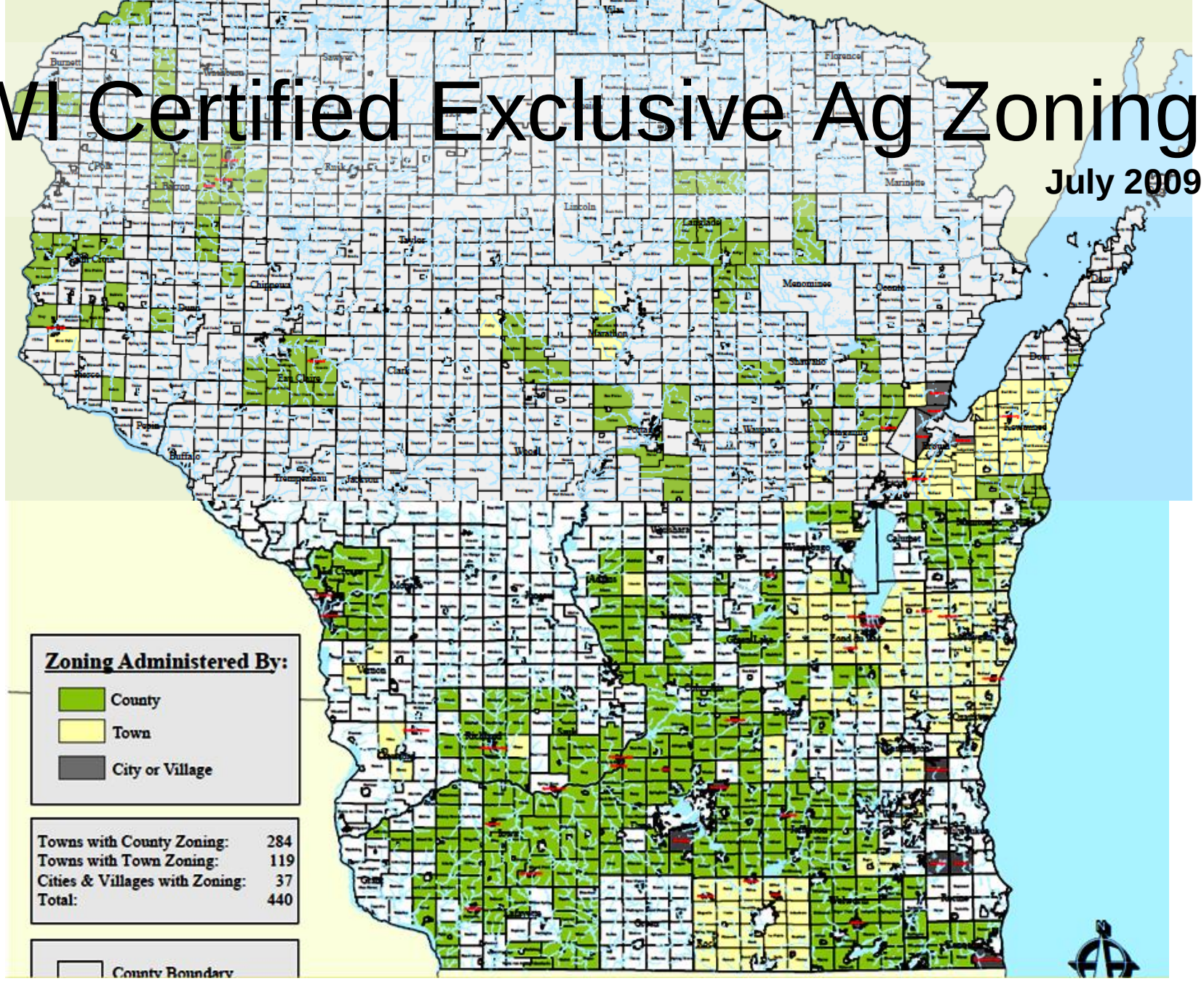
Expands the existing Farmland Preservation Program ~18,000 participants

Participants with 2004 agreements or later & Exclusive Ag Zoning participants

MUST follow ATCP 50 & NR 151 performance stds

WI Certified Exclusive Ag Zoning

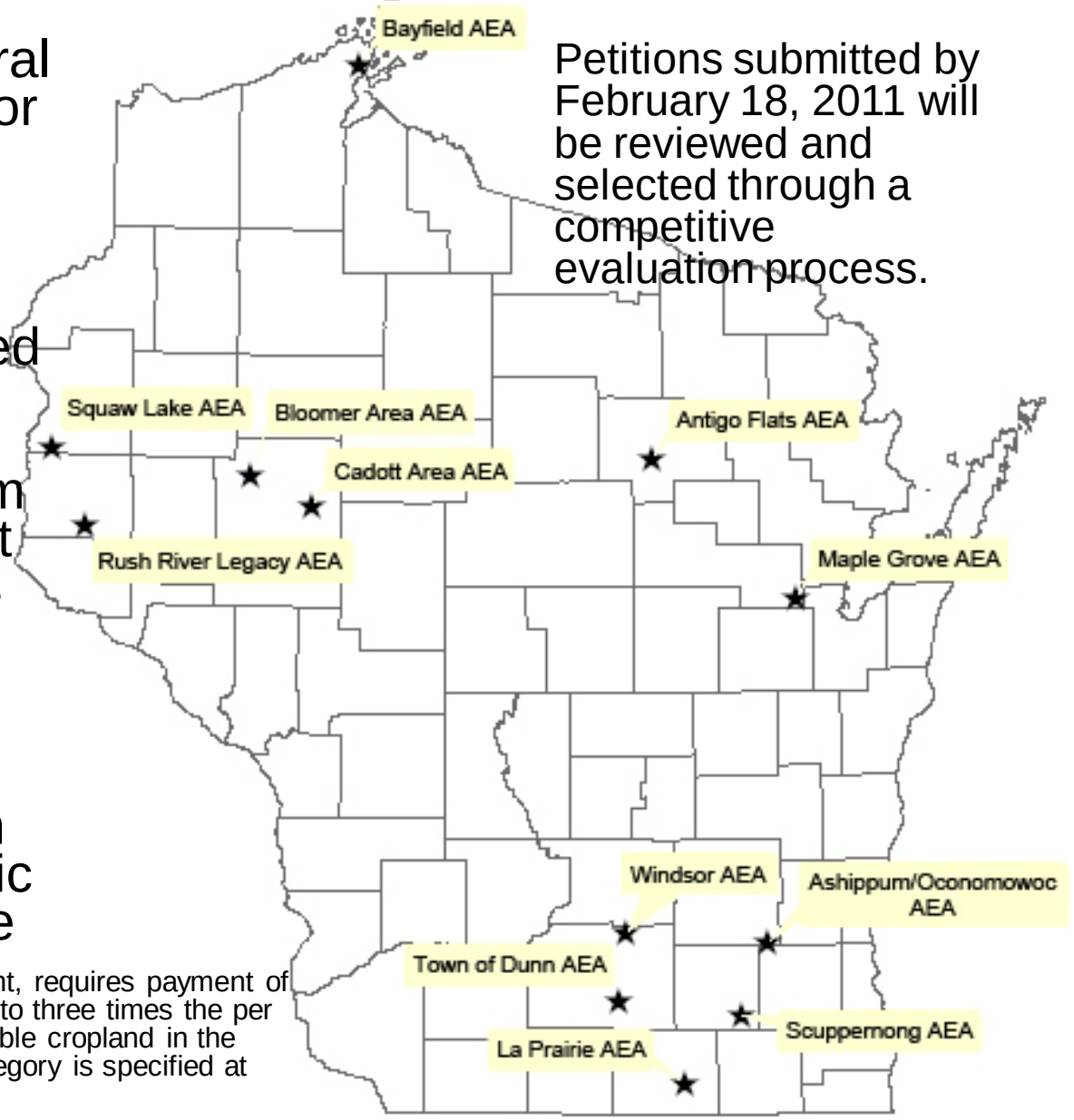
July 2009



Agricultural Enterprise Areas

- Area devoted to agricultural use and locally targeted for agricultural preservation
- After July 1, 2009 FPP agreements must be 15 years & within an approved AEA
- Petitioners to DATCP from the municipality of at least 5 owners of eligible farms located in a contiguous area - primarily in agricultural use
- State designates, through Administrative Rule, Public hearing, Legislative notice

Petitions submitted by February 18, 2011 will be reviewed and selected through a competitive evaluation process.



To be released from the terms of the agreement, requires payment of a conversion fee. This conversion fee is equal to three times the per acre value of the highest value category of tillable cropland in the place of the agreement. The highest value category is specified at http://www.revenue.wi.gov/report/a.html.

Purchase of Agricultural Conservation Easements Grant Program

Voluntary

Protects agriculture

Deed restriction

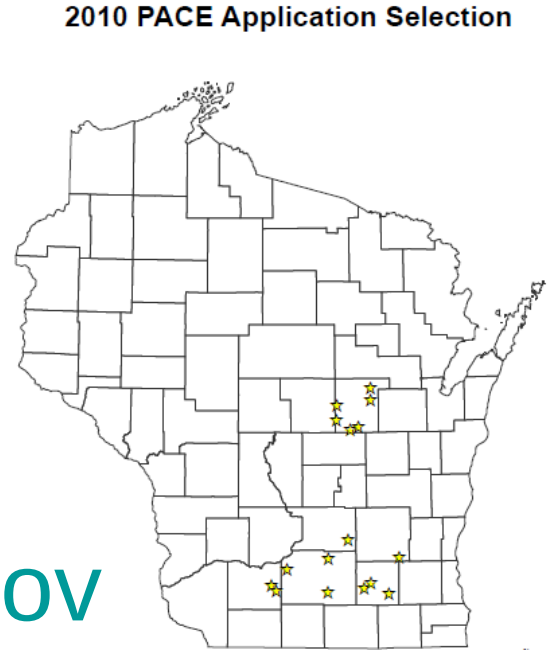
Permanent

- $12 million available to provide
  - 50% matching grants to purchase permanent easements that permanently restricts non-agricultural development
- Conversion Fee establishes a Working Lands Trust Fund for future PACE purchases

16 farms are selected to participate in the state's Purchase of Agricultural Conservation Easement (PACE) program to protect Wisconsin's best farmland

The farms cover more than 5,000 acres in Columbia, Dane, Dodge, Iowa, Jefferson, and Waupaca counties.

A deadline for 2011 applications is anticipated in February 2011.



http:workinglands.wi.gov

Income Tax Credits

decreases tax due or increases tax refund

Average credit prior to **2010 tax year** $650/yr
~$3.30/acre

- **$7.50/acre if located in a Certified farmland preservation zoning district**
- **$10.00/acre if agreement in AEA and zoning**
- **$5.00/acre if farmland preservation agreement in Agricultural Enterprise Area**
  AEA (15 year agreements)

FC Wisconsin farmland preservation credit

Schedule FC and instructions 2010

FPP tax credits claimants can only certify they are in compliance on their tax return if the farm either:

- (1) **Is certified in compliance by the county** with the state agricultural performance standards under NR 151 & ATCP 50
- (2) **Will be covered by a schedule of compliance** that enables claimants to comply with state conservation standards by a specific deadline set by the county (2009 claimants schedules can not extend beyond December 31, 2015)

county may issue a notice of non-compliance to suspend eligibility for tax credits

Soil & Water Conservation

- Counties must **monitor participant compliance** through farm inspections every 4 years
- DATCP must monitor each county every 4 years
- DATCP sent out 12,000 letters to 2008 claimants in participating counties asking land owners to contact the conservation department for assistance
- Counties may require landowners to **certify** their compliance *not more than* annually

http://www.datcp.state.wi.us/workinglands/soil-water_compliance.jsp

WI Agricultural Performance Standards

- **Meet tolerable soil loss** (T) on cropped fields
- **Follow 590 NM plan technical standard**
- **Prevent direct runoff from feedlots** or stored manure to waters of the state
- **Limit livestock access** along waters to maintain vegetative cover
- **Maintain manure storage** structures to prevent leaking and overflow
- **Follow manure storage technical standards** for constructing and abandoning

Near surface water or
areas susceptible to groundwater contamination

- **Do not stack** manure in an unconfined pile
- **Divert clean water** away from feedlots, manure storage, and barnyards

Plan Development & Review
What's in a NM plan?

- UW Soil test Crop need – nutrient credits = fertilizer to apply
- Accounts for **all** N-P-K nutrients for the crop rotation
- Assess P management for runoff control
- Based on UW soil test recommendations (Pub.A2809) with sampling every 4 yrs (UW Pub. A2100, certified lab)
- **Update 590 NM plan annually** to feed crops and protect water

Requires qualified planners

CCA's, CPAg, SSSA, CPCC, farmer planners

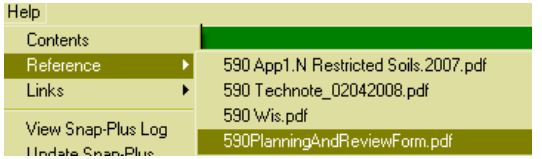
UW Snap Plus developers, helping NM planners address basic needs

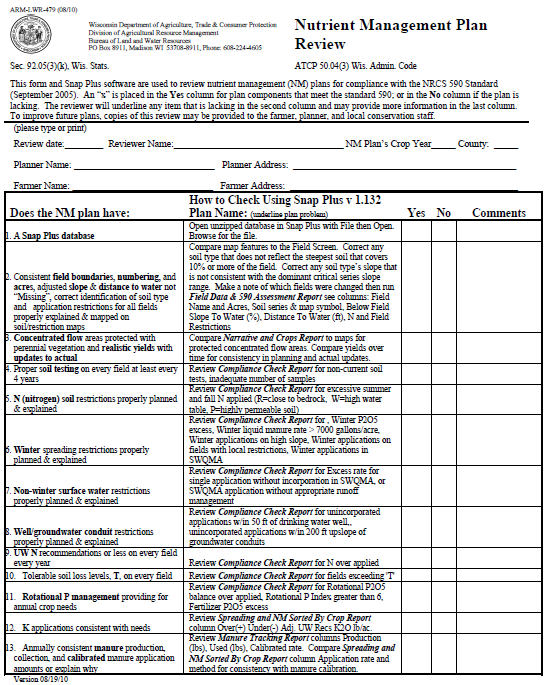
linking spreading restriction maps to NM plans

new restriction feature tagging

new reports in the Snap Plus computer software

- Snap Plus V 1.132 was tested on 48 NM plans in the 2010 Quality Assurance Team review.
- 9 plans were hand written but entered into Snap Plus as part of the review process 39 used Snap Plus for compliance with the 590 standard
  - soil loss calculations
  - P balancing, and
  - nutrient limits flagging





ARM-LWR-479 (08/10)

Wisconsin Department of Agriculture, Trade & Consumer Protection
Division of Agricultural Resource Management
Bureau of Land and Water Resources
PO Box 8911, Madison WI 53708-8911, Phone: 608-224-4605

Nutrient Management Plan Review

Sec. 92.05(3)(k), Wis. Stats. ATCP 50.04(3) Wis. Admin. Code

This form and Snap Plus software are used to review nutrient management (NM) plans for compliance with the NRCS 590 Standard (September 2005). An "x" is placed in the Yes column for plan components that meet the standard 590; or in the **No** column if the plan is lacking. The reviewer will underline any item that is lacking in the second column and may provide more information in the last column. To improve future plans, copies of this review may be provided to the farmer, planner, and local conservation staff.

(please type or print)

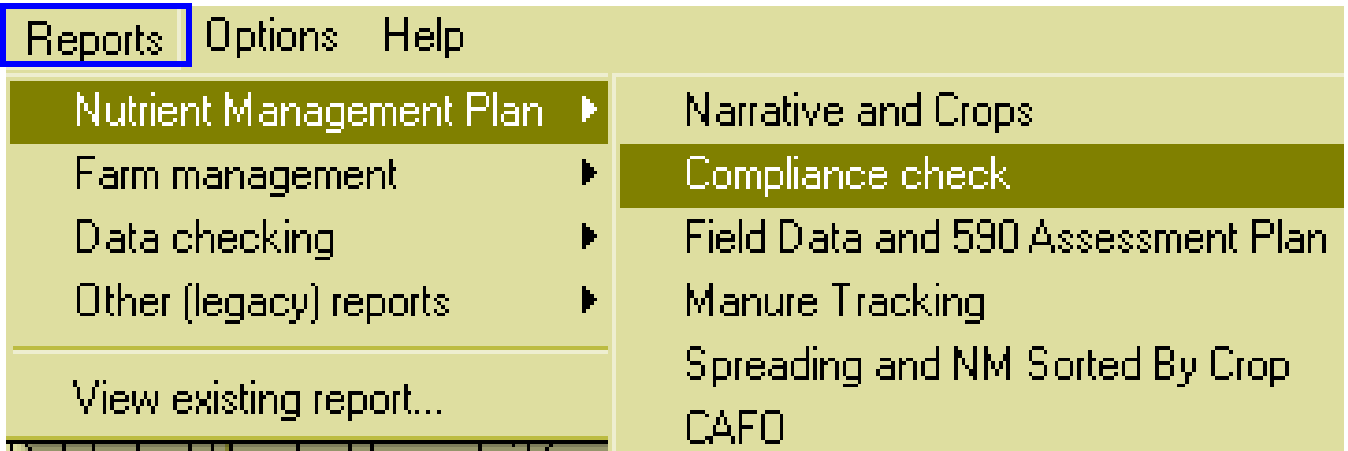
Review date:_____ Reviewer Name:_____ NM Plan's Crop Year_____ County: _____

Planner Name: _____ Planner Address: _____

Farmer Name: _____ Farmer Address: _____

Does the NM plan have:	How to Check Using Snap Plus v 1.132 Plan Name: (underline plan problem)	Yes	No	Comments
1. A **Snap Plus database**	Open unzipped database in Snap Plus with File then Open. Browse for the file.			
2. Consistent **field boundaries**, **numbering**, and **acres**, adjusted **slope** & **distance to water** not "Missing", correct identification of soil type and applicable restrictions for all fields properly explained & mapped on soil/restriction maps	Compare map features to the Field Screen. Correct any soil type that does not reflect the steepest soil that covers 10% or more of the field. Correct any soil type's slope that is not consistent with the dominant critical series slope range. Make a note of which fields were changed then run *Field Data & 590 Assessment Report* see columns: Field Name and Acres, Soil series & map symbol, Below Field Slope To Water (%), Distance To Water (ft), N and Field Restrictions			
3. **Concentrated flow** areas protected with perennial vegetation and **realistic yields** with **updates to actual**	Compare *Narrative and Crops Report* to maps for protected concentrated flow areas. Compare yields over time for consistency in planning and actual updates.			
4. Proper **soil testing** on every field at least every 4 years	Review *Compliance Check Report* for non-current soil tests, inadequate number of samples			
5. **N (nitrogen) soil** restrictions properly planned & explained	Review *Compliance Check Report* for excessive summer and fall N applied (R=close to bedrock, W=high water table, P=highly permeable soil)			
6. **Winter** spreading restrictions properly planned & explained	Review *Compliance Check Report* for _Winter P2O5 excess, Winter liquid manure rate > 7000 gallons/acre, Winter applications on high slope, Winter applications on fields with local restrictions, Winter applications in SWQMA			
7. **Non-winter surface water** restrictions properly planned & explained	Review *Compliance Check Report* for Excess rate for single application without incorporation in SWQMA, or SWQMA application without appropriate runoff management			
8. **Well/groundwater conduit** restrictions properly planned & explained	Review *Compliance Check Report* for unincorporated applications w/in 50 ft of drinking water well., unincorporated applications w/in 200 ft upslope of groundwater conduits			
9. **UW N** recommendations or less on every field every year	Review *Compliance Check Report* for N over applied			
10. Tolerable soil loss levels, **T**, on every field	Review *Compliance Check Report* for fields exceeding 'T'			
11. **Rotational P management** providing for annual crop needs	Review *Compliance Check Report* for Removal P2O5 balance over applied, Rotational P Index greater than 6, Fertilizer P2O5 excess			
12. **K** applications consistent with needs	Review *Spreading and NM Sorted By Crop Report* column Over(+) Under(-) Adj. UW Recs K2O lb/ac.			
13. Annually consistent **manure** production, collection, and **calibrated** manure application amounts or explain why	Review *Manure Tracking Report* columns Production (lbs), Used (lbs), Calibrated rate. Compare *Spreading and NM Sorted By Crop Report* column Application rate and method for consistency with manure calibration.			

Version 08/19/10



2010 NM plan reviews

most problematic issues

- properly soil testing
- identifying the dominant critical soil
- spreader calibration
- phosphorus management

most improvement

- nutrient spreading restrictions

Does the NM plan properly test soil?

- 19% (9 of 48) of the plans strictly followed the 5 acre per soil sample requirement on every field, a 31% decline from last year.

Of the farms that did not soil test properly:

- 20 of the farms needed to add another sample on 1 to 5 fields; 14 farms missing samples on more than 5 fields;
- 3 farms only provided the average soil test with no sample data;
- 11 farms had old tests.

Field Name	Year	Problem
01	2011	Soil test too old: 11/21/2005
01	2011	Too few soil samples for field size. Required 2 samples, actual 1 samples
02	2011	Soil test too old: 11/21/2005
03	2011	Soil test too old: 11/21/2005
03	2011	Too few soil samples for field size. Required 2 samples, actual 1 samples
04	2011	Soil test too old: 11/21/2005
04	2011	Too few soil samples for field size. Required 2 samples, actual 1 samples

Have your soil testing lab email you the soil test in Snap Plus format. Import them into Snap Plus saves time and allows for calculating lime recommendations. To review plans we use the Snap Plus ***Compliance Check Report.***

Wisconsin DATCP Certified Soil Testing Laboratory

5 Acre Samples Every 4 Years

http://www.datcp.state.wi.us/arm/agriculture/land-water/conservation/nutrient-mngmt/planning.jsp

UW Soil & Plant Analysis Laboratory Madison, WI	**UW Soil & Forage Lab** Marshfield, WI	**Agsource Soil & Forage Lab** Bonduel, WI	**Rock River Laboratory** Watertown, WI
Dairyland Laboratories Arcadia, WI	**A&L Great Lakes Laboratories** Fort Wayne, IN	**Mowers Soil Testing Plus, Inc.** Toulon, IL	

Does the NM plan have a spreader calibration?

- 35% (17 of 48) of the plans mentioned using calibrated manure applications to account for application speed and manure consistency, a 30% decline from 2009
  - *Use manure production book values to start.*
  - *Subsequent plans should track all manure applied by counting loads or storage volume.*

Annual Manure Production and Use by source

		2011	2012	2013	2014	2015
Dairy Grazed	Production (Tons)	0	0	0	0	0
	Used (Tons)	680	640	0	0	0
	Analysis Date					
	Analysis (N/Ni-P-K)	3/4-3-7	3/4-3-7	3/4-3-7	3/4-3-7	3/4-3-7
	Dry Matter (%)	12	12	12	12	12
	Total Value (total source volume, incorporated, includes sulphur)					
Dairy Pit	Production (Gallons)	1100000	1100000	1100000	1100000	1100000
	Used (Gallons)	2500400	2754400	1497000	762000	344000
	Analysis Date					
	Analysis (N/Ni-P-K)	7/10-5-16	7/10-5-16	7/10-5-16	7/10-5-16	7/10-5-16
	Dry Matter (%)	6	6	6	6	6
	Total Value (total source volume, incorporated, includes sulphur)					

Estimated Livestock Manure Production for 2011

Animal Type	# of animals	Total No. of days	% Solid Collected	% Liquid Collected	Yearly Tons	Yearly Gallons
Dairy Lactating Cows 1000 lbs	25	365	0	100	0	209875
Dairy Lactating Cows 1400 lbs	100	365	0	100	0	1168000
Dairy Dry Cows 1000 lbs	30	365	0	100	0	197100
Dairy Dry Cows 1400 lbs	25	365	0	100	0	228125
Dairy Heifer 750 lbs	20	365	100	0	237	0
				Farm Totals	237	1803100

Manure Storage Pits for 2011

Pit Name	Volume	Number of Times Emptied per Year	Total Collected Annually
Pit1	900000 Gallons	2	1800000 Gallons

Total Pit Tons = 0 **Total Pit Gallons** = 1800000

Spreaders for 2011

Spreader Name	Load Size	Number of Loads per Year	Total Collected Annually	Calibration Date	Calibration Notes
Spreader1	5 Tons	50	250 Tons	11/03/2010	20 T/A rate

Total Spreader Tons = 250 **Total Spreader Gallons** = 0

*To review plans we use the Snap Plus **Manure Tracking Report** to show annual manure production and use by source, livestock numbers, storage capacity, and spreader calibrations.*

Does the NM plan have protected concentrated flow areas?

- 46% (22 of 48) of plans mentioned they protected areas of **concentrated flow** with perennial cover nutrients should not be applied to established water ways, a 4% decline from last year.

Concentrated Flow Notes:

Maps show concentrated flow channels protected with perennial cover.

Field Name	2010	2011	2012	2013	2014
01	Pasture (not rotational), grass/legume None 3.1-4.0 ton/Acre	Pasture (not rotational), grass/legume None 3.1-4.0 ton/Acre	Alfalfa/Brome Seeding Spring Fall Chisel, disked 2.6-3.5 ton/Acre		
02	Pasture (not rotational), grass/legume None 3.1-4.0 ton/Acre	Alfalfa/Brome Seeding Spring Fall Chisel, disked 2.6-3.5 ton/Acre	Pasture (not rotational), grass/legume None 3.1-4.0 ton/Acre		
03	Wheat winter grain + straw Fall Chisel, disked 61-80 bu/Acre	Corn grain Fall Chisel, disked 131-150 bu/Acre	Corn silage Fall Chisel, disked 21-25 ton/Acre	Soybeans 15-20 inch row Fall Chisel, disked 36-45 bu/Acre	
04	Wheat winter grain + straw Fall Chisel, disked 61-80 bu/Acre	Corn grain Fall Chisel, disked 131-150 bu/Acre	Corn silage Fall Chisel, disked 21-25 ton/Acre	Soybeans 15-20 inch row Fall Chisel, disked 36-45 bu/Acre	

*Mention waterways on maps or in the narrative. To review plans we compare the new **Narrative and Crops Report** to maps, looking for protected concentrated flow areas.*

This report also compares yields over time for consistency in planning and actual updates.

Updating the NM plans with the nutrient applications and crop management that really occurred, allows the farmer to maintain compliance with the 590 NM standard.

Does the NM plan have phosphorus management?

- 40% of plans (19 of 48) included P management for each year of the crop rotation, a 15% decrease from 2009.
- New Snap Plus flags for **excess fertilizer P2O5** show when a field has more than the entire P2O5 recommendation for the planned rotation applied as manure or fertilizer.
- **Proper P management must account for all the manure produced annually** and allocate additional P fertilizer if applicable **for each year of the rotation**.

*Snap Plus keeps track of soil-banked P & K between soil tests on the Cropping Screen so farmers do not apply more than they need. Use the Snap Plus **Compliance Check Report** to know if the plan follows the 590 Std.*

This farm uses both PI and soil test P for P2O5 590 compliance.

Rotational restriction problems

Field Name	Rotation Years	Problem
01	2009-2012	Soil test P is greater than 100 ppm so P2O5 balance should be less than -44 lb/acre.
02	2009-2012	Soil test P is greater than 100 ppm so P2O5 balance should be less than -44 lb/acre.
13-14	2009-2012	Soil test P is greater than 100 ppm so P2O5 balance should be less than -44 lb/acre.

Application restriction problems

Field Name	Year	Problem
01	2011	Excess fertilizer P2O5. More than the entire P2O5 recommendation for the planned rotation on this field (0) has already been applied as manure or fertilizer.

Does the NM plan have the correct soil type and meet T?

- 33% of the (16 of 48) NM plans used the proper soil type on all fields, a 3% increase from last year.
- 54% (26 of 48) plans had every field meeting **tolerable soil loss** (T) for sheet and rill erosion, a 26% decrease from 2009.
  - Of the 22 plans found with fields exceeding tolerable soil loss levels 11 of the planners chose the predominant soil type and not the more erosive, "**Dominant Critical Soil**" type that covers 10% or more of the field.
  - The other 11 of 22 plans exceeded soil loss because of incomplete rotations or crop and tillage choices.

Snap Plus allows farmers & planners to update crops, tillage, calculate soil loss over the crop rotation, making it an excellent tool for conservation planning and to meet 590

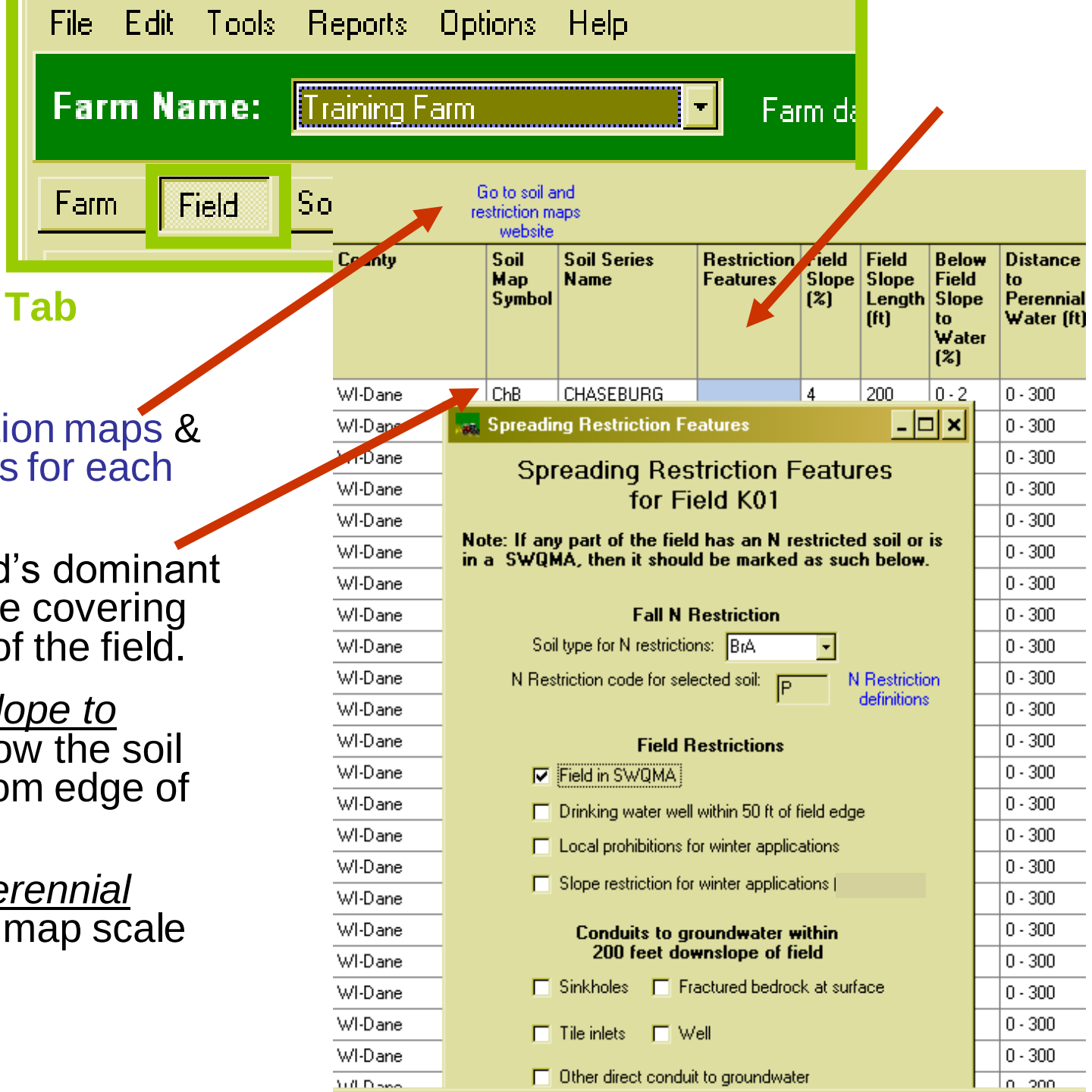
Snap Plus is available free

http://www.snapplus.net/

Developing or Reviewing a plan

Snap Plus Field Tab

- Link to restriction maps & List restrictions for each field
- Select the field's dominant critical soil type covering 10% or more of the field.
- *Below Field Slope to Water (%)* follow the soil types slope from edge of field down hill
- *Distance to Perennial Water (ft)* use map scale



Does the NM plan have correct application restrictions?

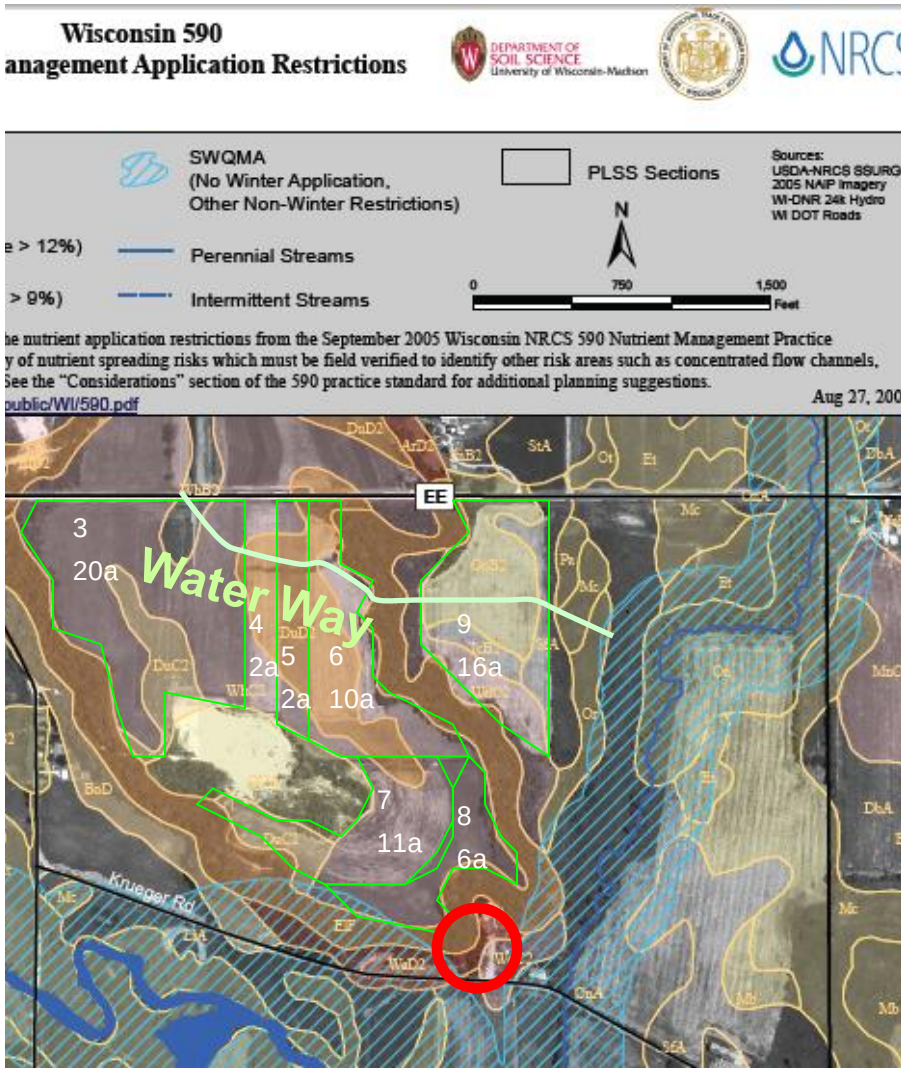
- 200’ setback from wells, sinkholes, fractured bedrock at the surface - nutrient applications must be incorporated within 72 hours.

- **Blue** No winter apps 300’ from perennial streams, 1,000’ from lake and ponds. Other non-winter application restrictions required.

- **Red** No winter apps.

- **Pink** and **clear** can have winter manure apps if contoured or if slopes are 9% or less. Winter manure apps can not exceed 7,000 gals/acre or P removal of the crop.

- **Yellow** No fall apps of fertilizer N. Fall manure apps limited. Best to Spring apply.



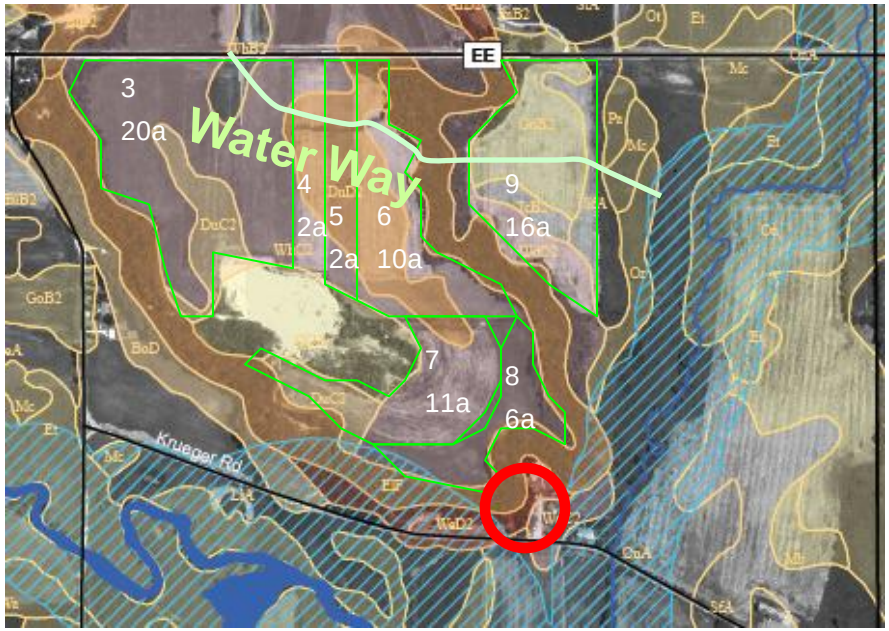
Does the NM plan have correct application restrictions?

O 65% (31 of 48) of the plans correctly incorporated applications 200’ up slope of **wells**, a 5% improvement from 2009.

Blue 83% (40 of 48) of plans included spreading restrictions for **surface waters**, a 38% increase from last year.

Nutrient and Manure Application Restriction Maps
available free for all of Wisconsin

Blue & Red 75% (36 of 48) of plans properly planned for **winter spreading restrictions**, a 10% increase from last year. The 590 standard restricts winter spreading on steep slopes and close to surface waters.



Yellow 79% (37 of 48) of the plans properly planned for **N soil restrictions**. A 24% improvement from 2009. These soils are likely to leach N to groundwater.

http://mmas-mapping.soils.wisc.edu/

Summary

- Keep good records of all manure & fertilizer applied each year of the rotation
- Farmer can receive tax credits $5 to $10/acre/yr for preserving farmland & protecting water quality
- Use the new application restriction maps to identify: water restrictions, soils, slope, concentrated flow channels, wells & other groundwater conduits
- SNAP Plus helps farmers keep NM plans flexible and updated with correct soil loss and applications that meet the 590 standard www.snapplus.net
- For NM information http://www.datcp.state.wi.us/arm/agriculture/land-water/conservation/nutrient-mngmt/planning.jsp

Sue Porter, DATCP 608-224-4605 sue.porter@wi.gov