Better-Faster NM Planning

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NM Then and Now

1997 WI's legislature amended Statute 281.16 & 92 requiring NM – WI's Admin. Codes NR 151 & ATCP 50 passed NM requirements in 2002

2005 590 Std. with N & P requirements – P management started in 2008

2009 New Farmland Preservation Program $7.50 & $5/ac/year in Ex-Ag Zoning & Ag Enterprise Area – 1st PDF Application Restriction maps available for all WI

2011 Snap Plus checking applications with field attributes for meeting 590 standard – GIS web service and interactive web based restriction maps

2012 NEW NR 151 performance standards promulgated – requiring ATCP 50 to detail how to implement – Runoff Risk weather maps – NEW national 590 standard released requiring states to address new requirements – Snap Plus Ver. 2

A WI 590 Nutrient Management Plan is Updated Annually if plans change

Accounts for all N-P-K applied to fields each year of the crop rotation

79% (42 of 53) of plans had N recommendations that complied with the 590 standard for every field, a 10% increase from 2011.

70% (37 of 53) managed all the manure and P fertilizer for each year of the rotation, most improved this year, a 22% increase from 2011.

Meets tolerable soil loss and has waterways

79% (42 of 53) of the plans had every field meeting tolerable soil loss (T) for sheet and rill erosion, a 13% increase from 2011.

51% (27 of 53) of plans mentioned concentrated flow channels were protected from erosion, most problematic last year, a 12% increase from 2011.

Follows calibrated manure application rates

51% (27 of 53) of the plans used calibrated manure applications, most problematic this year, a 4% decrease from 2011.

A WI 590 Nutrient Management Plan addresses water quality with seasonal 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 Dots No fall apps of fertilizer N. Fall manure apps limited. Best to Spring apply.

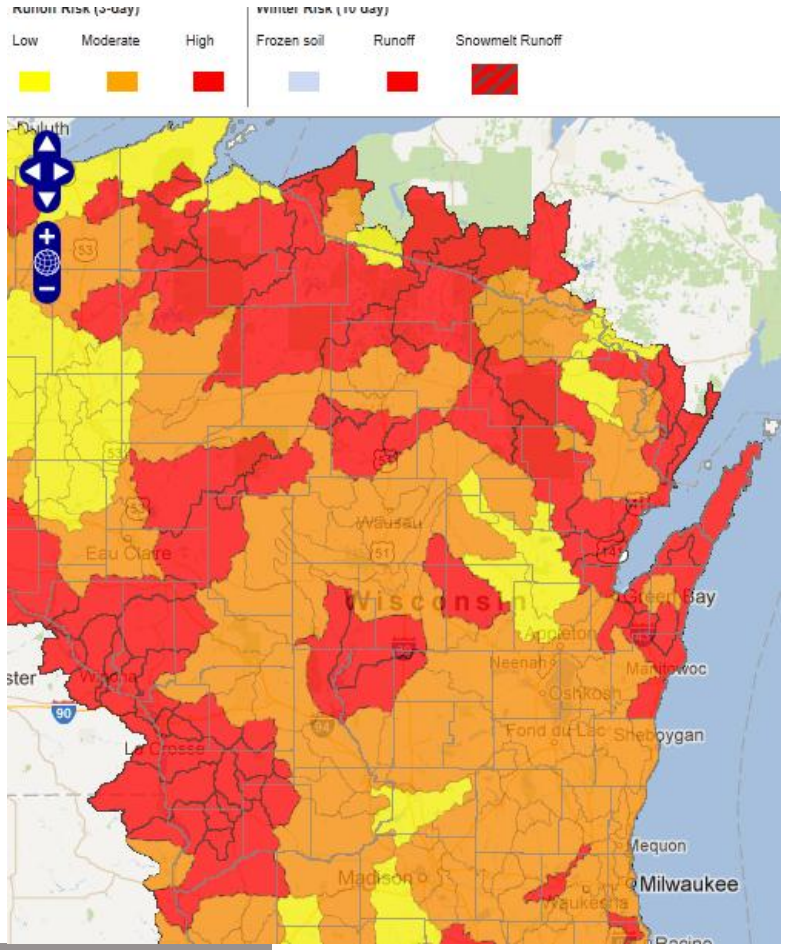
74% (39 of 53) of the plans had **wells** identified

94% (50 of 53) of plans highlighted **surface waters** since these areas require application incorporation, 30% plant cover on soil surface, cover crops, or filter strips. Unincorporated liquid applications also have rate limits.

89% (47 of 53) of plans followed **winter spreading restrictions** on steep slopes and areas near surface waters.

92% (49 of 53) of the plans correctly addressed **soil N restrictions** helping to reduce nitrate losses to groundwater.

www.manureadvisorysystem.wi.gov



Forecast updated: Oct 23 12PM CDT

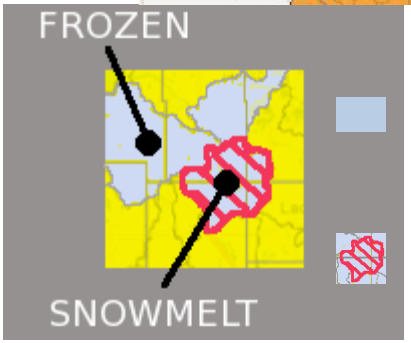
Oct 23 Oct 24 Oct 25

Please take the survey

Runoff Risk Advisory Forecast Maps from National Weather Service's flood forecasting

Assess the risk for each field before an application, fields can be saturated and still have a low risk of runoff if no rainfall is predicted

Liquid manure applications increase soil moisture so runoff risk of liquid manure will be higher than what is shown on the risk map



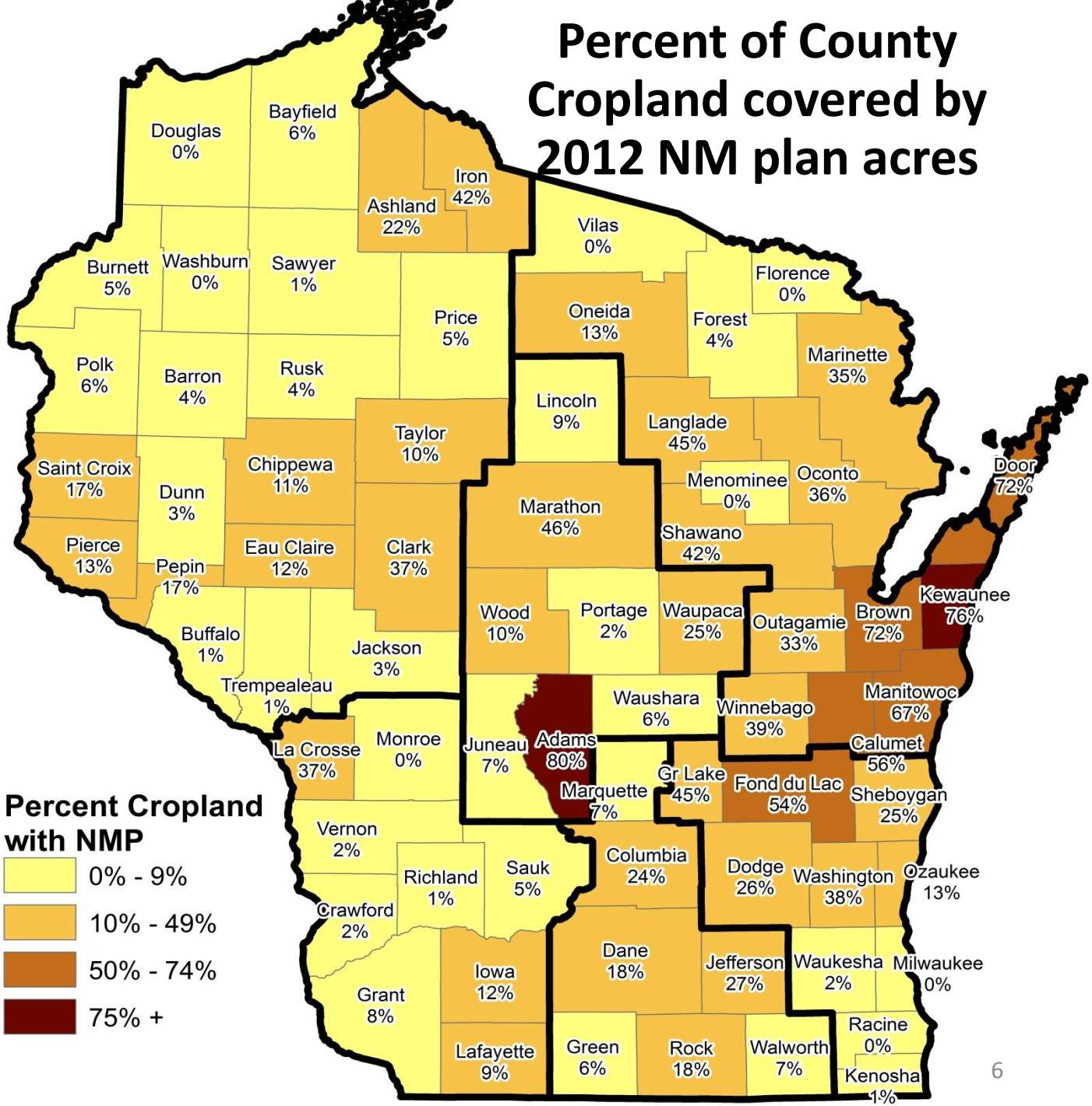
Winter Runoff Risk

Soils are **frozen** or snow-covered and not yet forecasted for runoff. Caution - applications will have limited soil contact and infiltration.

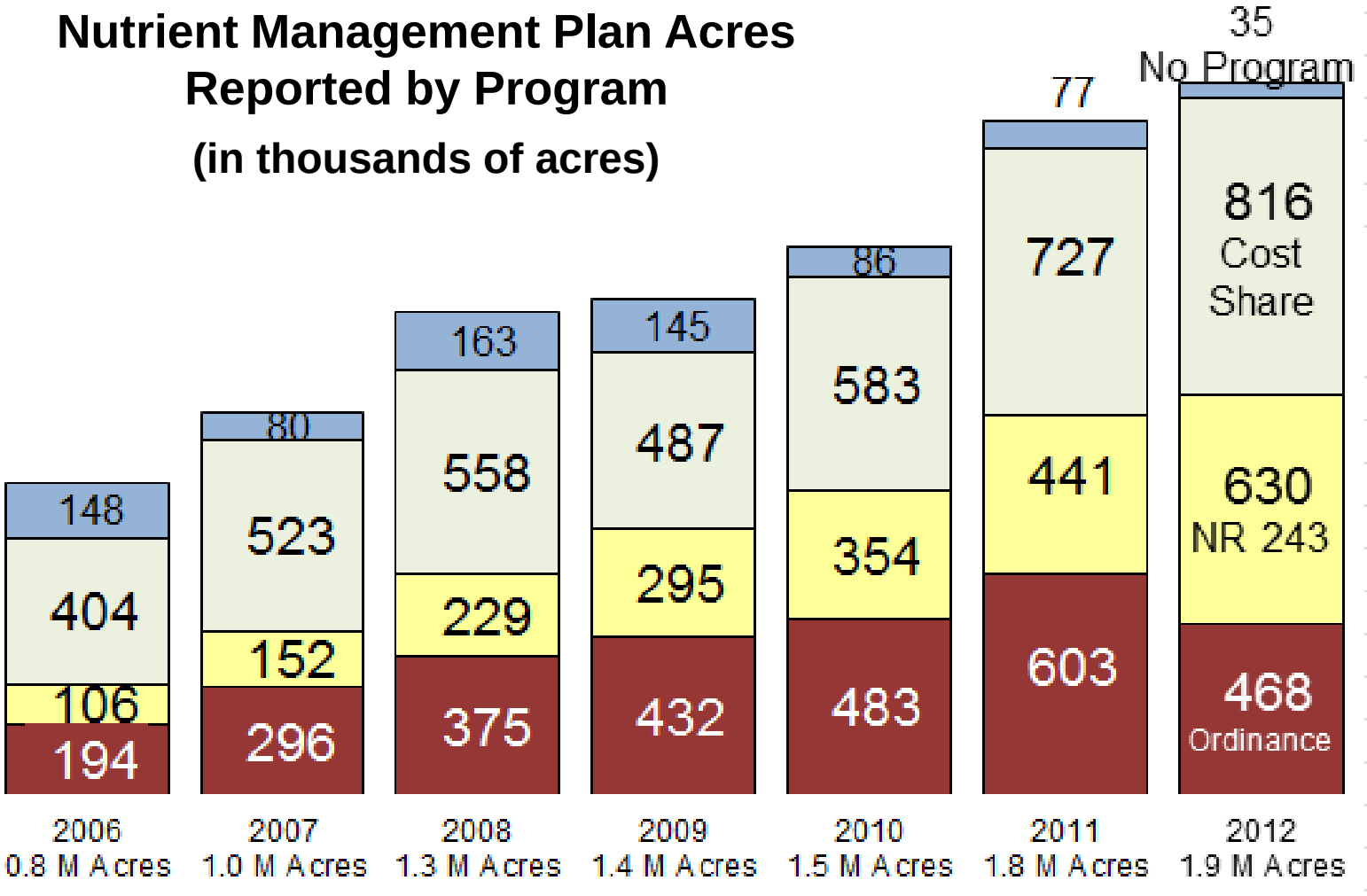
High snowmelt risk and runoff is predicted within 10 days

2012 NM

3,867plans were submitted for **1,949,856 acres** covering 22% of WI's 9 M cropland acres **5% increase** in acres compared to 2011



2006-2012
Nutrient Management Plan Acres
Reported by Program
(in thousands of acres)



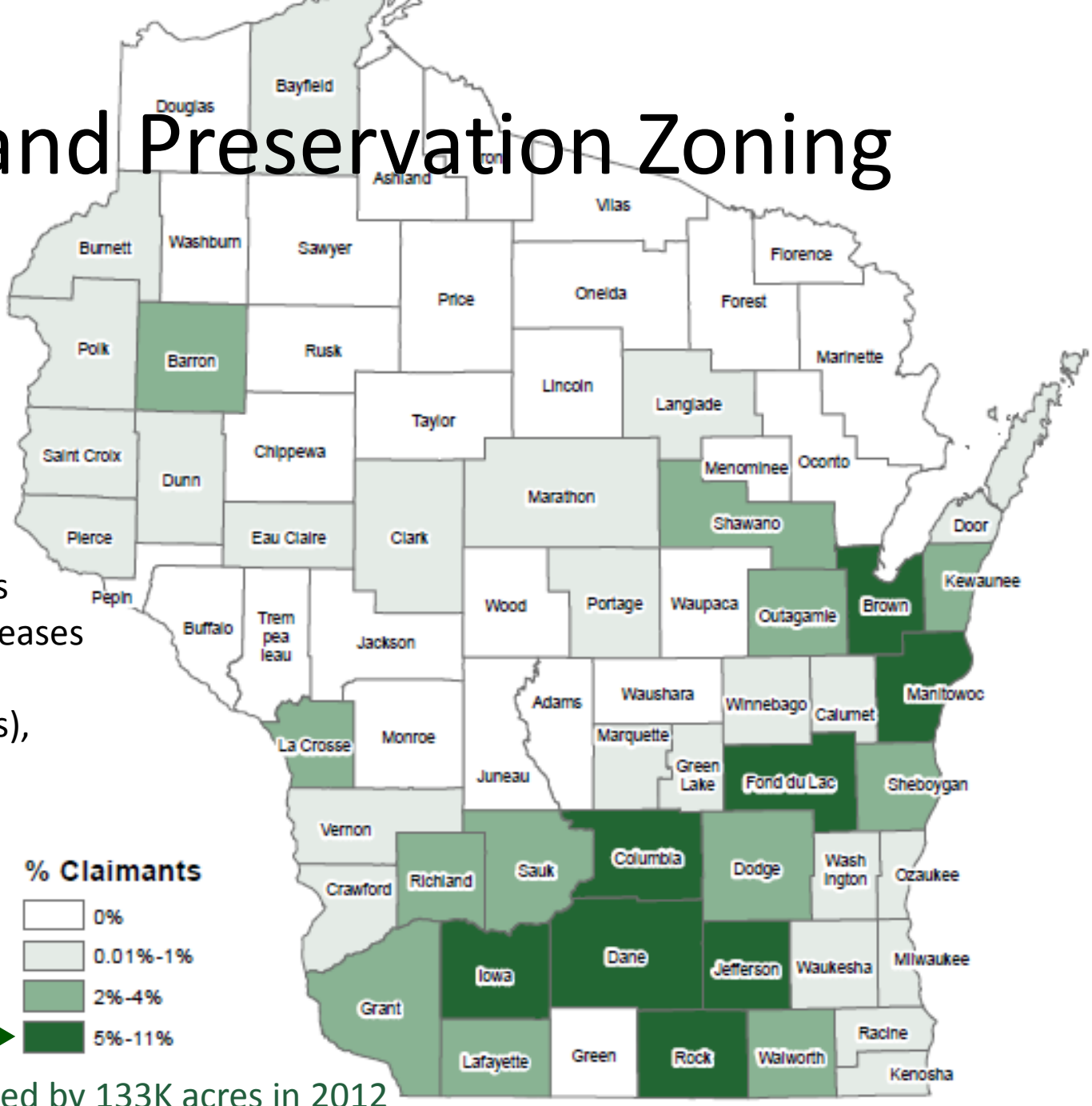
DATCP increased acres 24% and NR243 increased 30% all other categories lower in 2012 than in 2011

Farmland Preservation Zoning

% of 2010
13,000 Claimants
Under FP Zones

15,000 total
FPP claimants

Out of all WI the counties reporting the largest increases in NMP acres are: **Manitowoc** (57,000 acres), **Columbia** (27,000 acres), **Sheboygan** (25,000), and **Rock** (23,000).



6,600 or 53% of **FP zoned claimants**

600K NMPs acres increased by 133K acres in 2012

2011 Farmland Preservation

protecting water resources & soil productivity

http:workinglands.wi.gov

Working Lands Initiative Started July 1, 2009 for tax year 2010

$27M to WI farmers **decreasing tax due or increasing tax refund** in exchange for keeping land in AG use and complying with soil and water conservation requirements

$7.50/acre in a Certified farmland preservation zoning district

$5.00/acre if farmland preservation agreement in Agricultural Enterprise Area AEA (15 year agreements)

$10.00/acre if agreement in AEA and zoning

Existing WI Agricultural Performance Standards

counties will monitor compliance and may suspend eligibility for tax credits

- **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

NR 151 NEW AG PERFORMANCE STANDARDS

requires ATCP 50 to add NM plan requirements to limit **Phosphorus Index** for cropland and pastures to average of **6 over the rotation** and **12 or less annually**

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

1. *participating in the Farmland Preservation Program*
2. *required by local manure storage or livestock siting ordinances*
3. *accepting cost share for manure storage*
4. *causing a discharge*
5. *regulated by a WPDES permit*

Current Cropland P Management

For non-permitted animal operations

590 requires P assessment <u>where manure or other organic by-products are applied</u>

- ✓ P Index (PI) PI> 6 then no manure

OR

- ✓ Soil Test P >100 PPM then P2O5 balance <25% of crop removal over 8 yrs or less

For CAFO permitted animal operations

<u>NR 243.14 requires 590 P management if <100 PPM soil test P</u>

<u>soil test P 100 to 200 PPM</u>

- ✓ PI> 6 then no manure app allowed

AND

- ✓ Soil Test P >100 PPM then P2O5 balance <50% of crop removal over 4 yrs or less

<u>Above 200 PPM soil test P no CAFO manure allowed</u>

The PI is not available for:

- some soils
- fruit crops like cranberries and apples
- some vegetable crop sequences
- crops without a RUSLE2 soil loss estimate
- crops without a UW soil test recommendation

Current Pastureland P Management

1. *where nutrients are <u>mechanically</u> applied*
2. *where pastures are in SWQMA & winter grazed*

ATCP 50(ATCP 50.04(3))
Follow 590 where nutrients are <u>mechanically</u> applied.

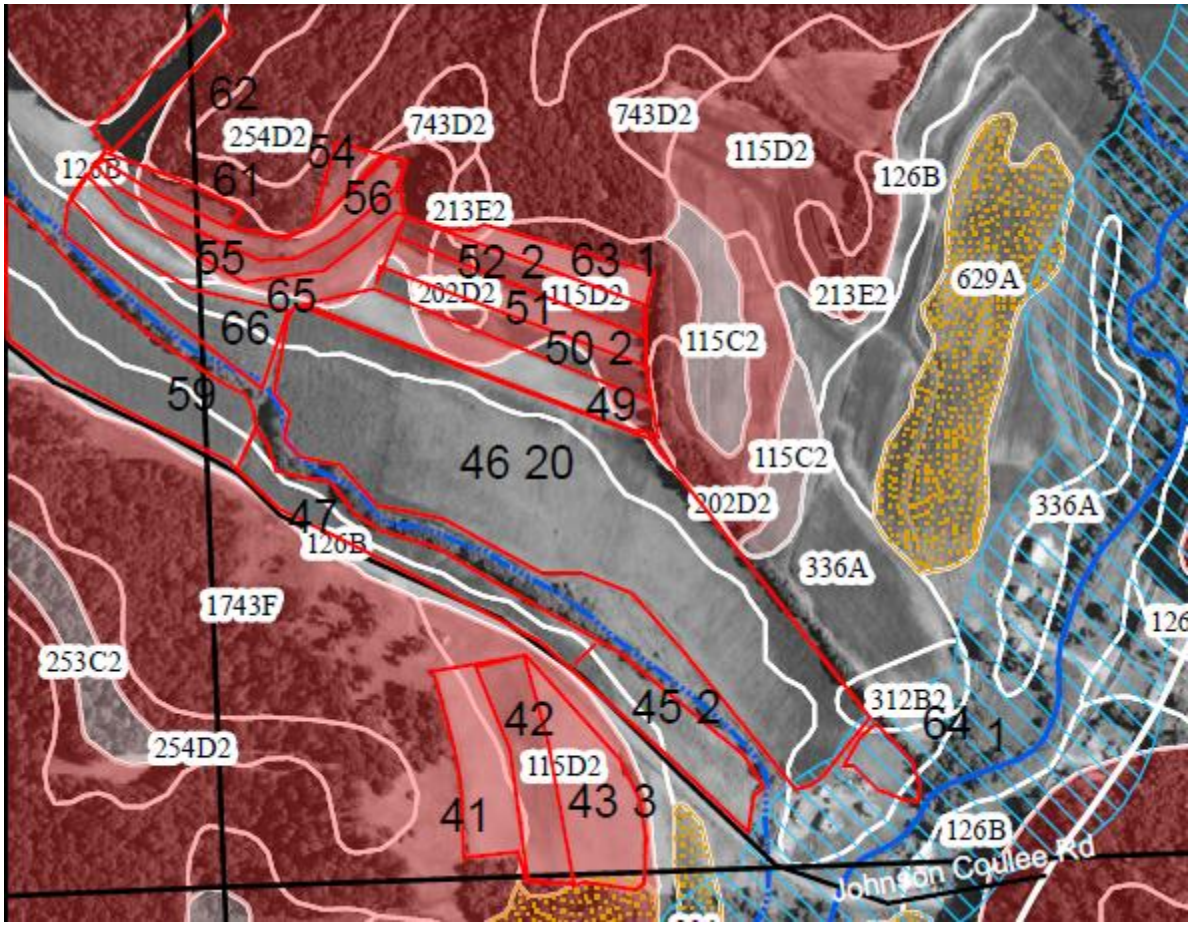
NRCS 590 Std. (A.2.b.(1) page3&4)
Prohibits winter applications in SWQMA – EXCEPT when winter grazing and the field is included in the NM plan.

NRCS 590 Std. (A.1.m. page 3)
Where pasturing occurs, verify through computations that the nutrients do not exceed the N and P requirements of 590.

NM planning on Pasture in WI

- About 1.5 million acres of land is non-woodland pasture (2007 WI Census of Ag)
- If all get NM planning cost share @ $28/ac = $40 million
- If targeting high risk areas near water (20%) reduces costs to $8 million

NR 151 PI of 12 annually & 6 over the rotation



LaCrosse farm handwritten 128 acres with 35 fields

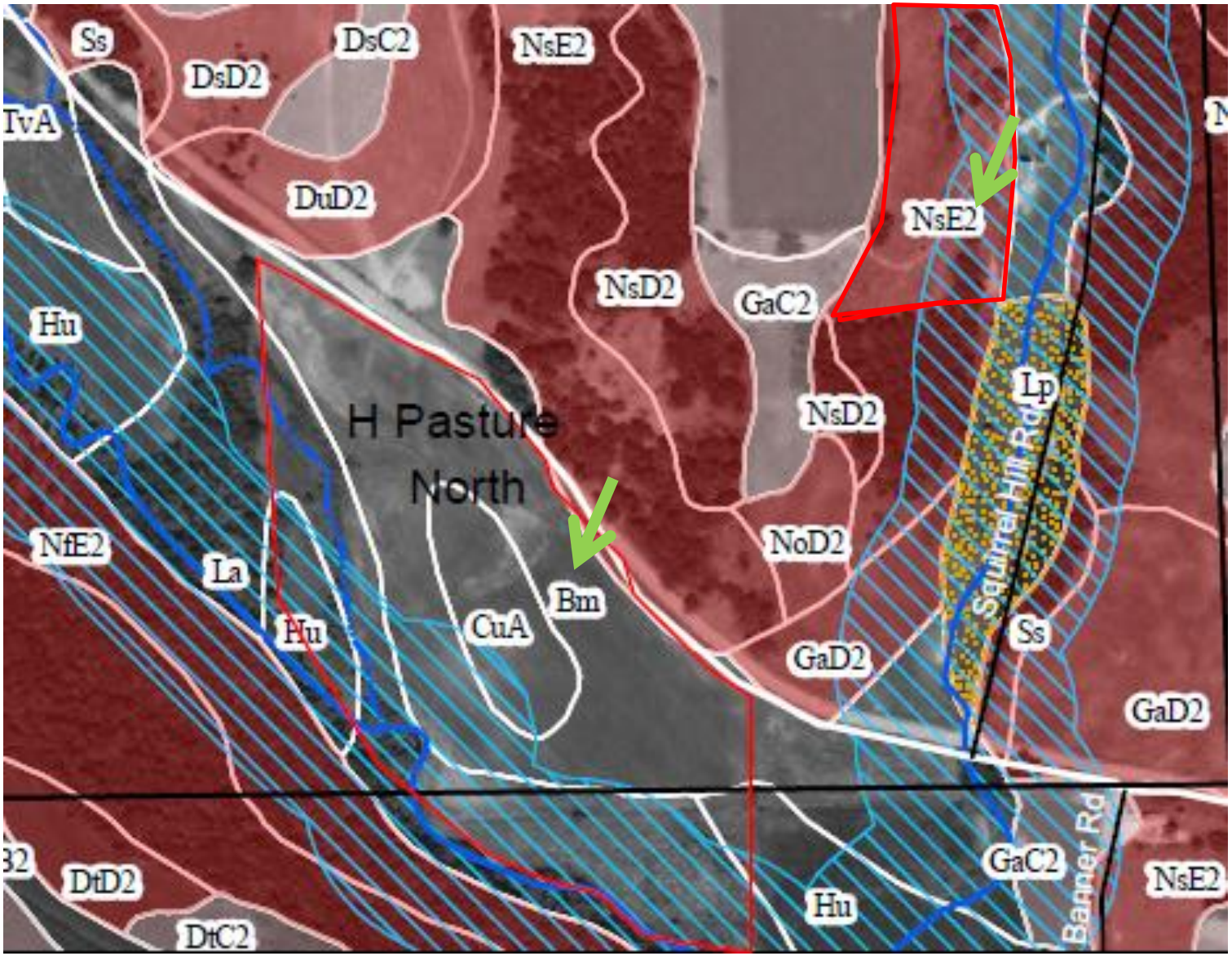
Appears to meet soil test P requirements for fields exceeding 50 PPM soil test P.

- For future NR 151 compliance problem annual PI above 12
- 9 fields exceed PI of 6
- 14 exceed an annual PI of 12 on the second year corn

Lower the annual PI below 12 in the future requires

  - no-tilled 1st year corn
  - single pass 2nd year corn

NM Planning of Pasture



Snap-Plus 1.132.8

File Edit Tools Reports Options Help

Farm Name: Pasture Farm — Farm data directory: C:\SnapPlus\MySnapPlusData\Pasture farmTables.10-04-2012

Farm | Field | Soil Tests | Nutrient Sources | Cropping

Field Name: H North Pasture

County	Acres	Slope	Soil Name	Symbol	Restrictions	Soil Group	Soil Text
WI-Iowa	32	1.5	BOAZ	Bm	YES ?	A	SILT_LO

Subfarm:

Rotation Wizard | NPM Fast Facts | Calculate all years | **2014 soil test date: 10/4/2012**

pH	OM %	P (ppm)	K (pp
7.1	3.0	33	72

First Year | Page Back | Prev Year | Next Year | Page Fwd | Last Year

	2012			2013			2014								
Crop:	Pasture/dry lot, spars			Pasture, rotationally g			Pasture, rotationally g								
Yield Goal:	0-0			3.1-4.0			3.1-4.0								
Tillage:	None			None			None								
Soil Test Date:	10/4/2012			10/4/2012			10/4/2012								
Lime Rec:	NA			0			0								
Irrigation / MRTN info:	Irrigated			Irrigated			Irrigated			Irrigated			Irrigated		
Season notes:															
(lbs/acre)	N	P2O5	K2O	N	P2O5	K2O	N	P2O5	K2O	N	P2O5	K2O	N	P2O5	K2O
Recommendation:	0	0	0	0	0	180	0	0	180						
Prior years' extra:		0	0		96	173		141	74						
Adjusted recommendation:	0	0	0	0	0	7	0	0	106						
1st & 2nd year legume credit:	0			0			0								
Ext. manure credits (unused):	0	0	0	0	0	0	0	0	0						
This year's manure:	77	96	173	36	45	81	36	45	81						
This year's fertilizer:	0	0	0	0	0	0	0	0	0						
Total credits & applications:	**77**	**96**	**173**	**36**	**45**	**81**	**36**	**45**	**81**						
Over(+)/Under(-) adj UW rec:	**77**	**96**	**173**	**36**	**45**	**74**	**36**	**45**	**-25**						
Annual Total PI Details	**6**			**4**			**3**								
Particulate PI:	**1.7**			**0.2**			**0.0**								
Soluble PI:	**4.7**			**3.9**			**3.0**								
Acute loss (frozen) PI:	**3.0**			**3.2**			**2.7**								

Field notes:

Rotation Settings

3 year crop rotatio starting in 2012

Contouring: None | On contour | Strip cropping

Filter str: Nor | Des field | Des in-fie

Rotation Summe Results 2012 - 20

Avg soil loss	0.3	
Field "T"	5	t/a
Avg P Index	4	
P2O5 removal	90	lb/a
K2O removal	360	lb/a
P2O5 balance	96	lb/a
K2O balance	-25	lb/a

Soil test P is 50 or less so no P2O5 balance target is need

Snap-Plus Nutrient Application Planner

Farm nutrient source availability

Values are for first year available nutrients in lbs/ton or lbs/1000 gallons

By Season

Souce name	Nutrient type	Units	N	N incorp	P2O5	K2O	S	Available annual volume	Planned applications	Remaining volume
Beef graze	Beef, grazing	Tons	4.0	5.0	5.0	9.0	1.0	539	614	-75
							Total solid:	539	614	-75
							Total liquid:	0	0	0

Field: H North Pasture	Acres: 32	Crop: Pasture/dry lot, sparse grass	N	P2O5	K2O
	Year: 2012	Field Over(+)/Under(-) Application (lbs/acre)	77	96	173

Field Application Restrictions: N Winter Slope SWQMA Groundwater Conduit Other

View Field Restrictions

Manure / Biosolid Applications

Add nutrient app | Delete nutrient app | Crop Year: Fall 2011 - Summer 2012.

Season	Source name	Spread method	Rate	Units	Applied
Winter	Beef graze	Grazing	9.6	T/A	☐
Summer	Beef graze	Grazing	9.6	T/A	☐

Fertilizer Applications

Add fert app | Delete fert app

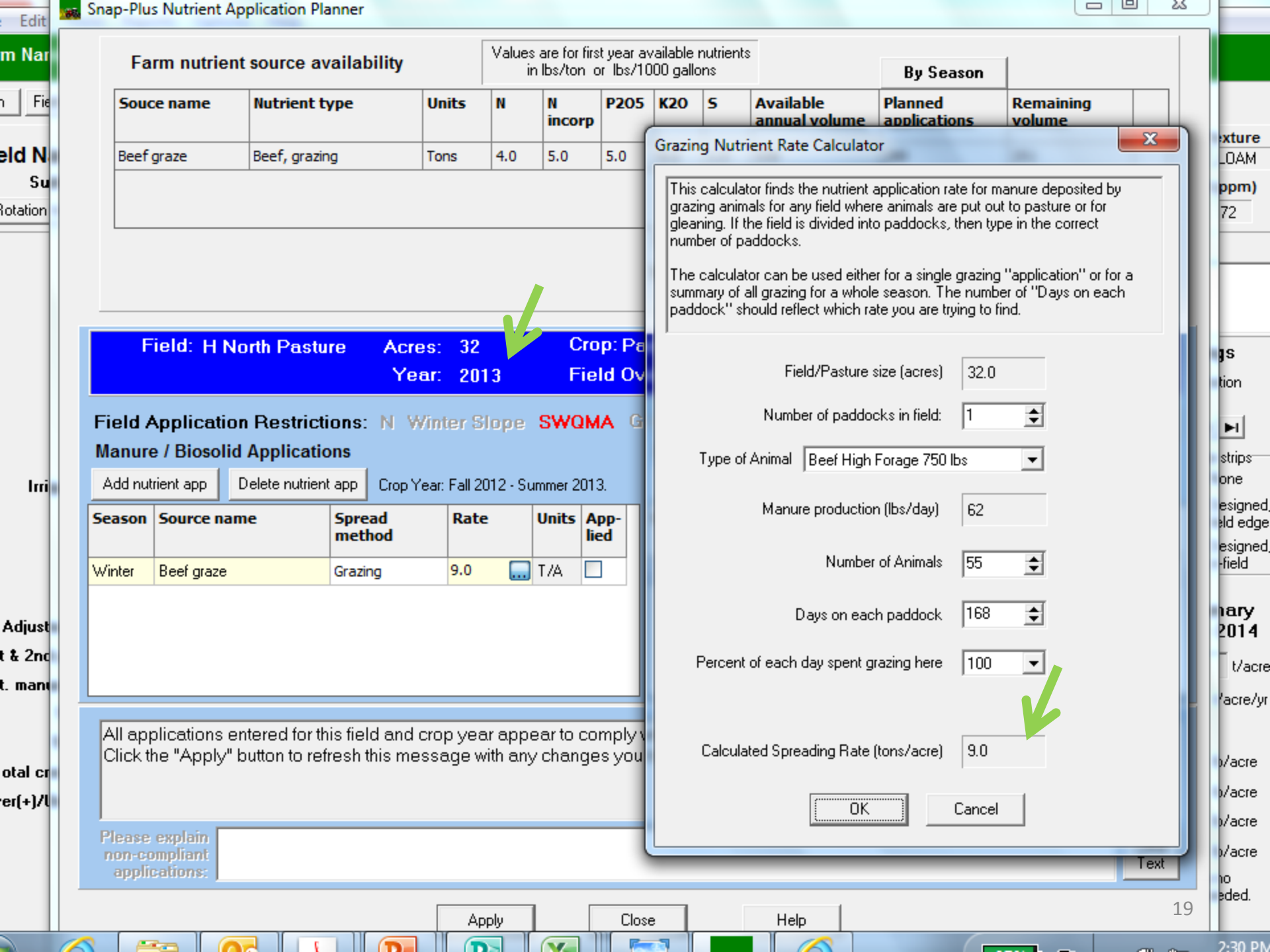
Season	Fertilizer Name	Spread method	Rate	Units	Applied
					☐

This field is within a SWQMA and is receiving manure nutrients in the winter that are not being recycled by a crop.

Please explain non-compliant applications:

Clear Text

Apply | Close | Help


Snap-Plus Nutrient Application Planner
Farm nutrient source availability
Values are for first year available nutrients in lbs/ton or lbs/1000 gallons
By Season
Souce name
Nutrient type
Units
N
N incorp
P2O5
K2O
S
Available annual volume
Planned applications
Remaining volume
Beef graze
Beef, grazing
Tons
4.0
5.0
5.0
Field: H North Pasture
Acres: 32
Year: 2013
Field Application Restrictions: N Winter Slope SWQMA
Manure / Biosolid Applications
Add nutrient app
Delete nutrient app
Crop Year: Fall 2012 - Summer 2013.
Season
Source name
Spread method
Rate
Units
App-lied
Winter
Beef graze
Grazing
9.0
T/A
All applications entered for this field and crop year appear to comply
Click the "Apply" button to refresh this message with any changes you
Please explain non-compliant applications:
Text
Apply
Close
Help
Grazing Nutrient Rate Calculator
This calculator finds the nutrient application rate for manure deposited by grazing animals for any field where animals are put out to pasture or for gleaning. If the field is divided into paddocks, then type in the correct number of paddocks.
The calculator can be used either for a single grazing "application" or for a summary of all grazing for a whole season. The number of "Days on each paddock" should reflect which rate you are trying to find.
Field/Pasture size (acres)
32.0
Number of paddocks in field:
1
Type of Animal
Beef High Forage 750 lbs
Manure production (lbs/day)
62
Number of Animals
55
Days on each paddock
168
Percent of each day spent grazing here
100
Calculated Spreading Rate (tons/acre)
9.0
OK
Cancel

File Edit Tools Reports Options Help

Farm Name: Pasture Farm — Farm data directory: C:\SnapPlus\MySnapPlusData\Pasture farmTables.10-04-2012

Farm | Field | Soil Tests | Nutrient Sources | Cropping

Field Name: H North Pasture

Subfarm:

Rotation Wizard | NPM Fast Facts | Calculate all years

County	Acres	Slope	Soil Name	Symbol	Restrictions	Soil Group	Soil Text
WI-Iowa	32	22	NORTHFIELD	NsE2	YES	E	LOAM

2014 soil test date: 10/4/2012 — pH 7.1 | OM % 3.0 | P (ppm) 33 | K (pp 72

First Year | Page Back | Prev Year | Next Year | Page Fwd | Last Year

	2012	2013	2014		
Crop:	Pasture/dry lot, spars	Pasture, rotationally g	Pasture, rotationally g		
Yield Goal:	0-0				
Tillage:	None				
Soil Test Date:	10/4/2012	10/4/2012	10/4/2012		
Lime Rec:	NA	0	0		
Irrigation / MRTN info:	Irrigated	Irrigated	Irrigated	Irrigated	Irrigated
Season notes:					

Crop dropdown options:
- CRP
- Pasture seeding, grass/legume
- Pasture, rotationally grazed, grass/legume
- Pasture/dry lot, sparse grass

(lbs/acre)	2012 N	2012 P2O5	2012 K2O	2013 N	2013 P2O5	2013 K2O	2014 N	2014 P2O5	2014 K2O
Recommendation:	0	0	0	0	25	180	0	25	180
Prior years' extra:		0	0		96	87		116	0
Adjusted recommendation:	0	0	0	0	0	93	0	0	180
1st & 2nd year legume credit:	0			0			0		
Ext. manure credits (unused):	0	0	0	0	0	0	0	0	0
This year's manure:	77	96	173	36	45	81	36	45	81
This year's fertilizer:	0	0	0	0	0	0	0	0	0
Total credits & applications:	77	96	173	36	45	81	36	45	81
Over(+)/Under(-) adj UW rec:	77	96	173	36	45	-12	36	45	-99

	2012	2013	2014
Annual Total PI (Details)	34	7	2
Particulate PI:	30.0	4.0	0.4
Soluble PI:	4.3	2.6	1.1
Acute loss (frozen) PI:	1.1	1.7	1.0

Field notes:

Rotation Settings

3 year crop rotation starting in 2012

Contouring: None | On contour | Strip cropping

Filter strip: None | Desig field | Desig in-fie

Rotation Summa Results 2012 - 20

Avg soil loss	6.8	t
Field "T"	2	t/ac
Avg P Index	14	
P2O5 removal	90	lb/a
K2O removal	360	lb/a
P2O5 balance	96	lb/a
K2O balance	-25	lb/a

Soil test P is 50 or less so no P2O5 balance target is neede

Snap-Plus 1.132.8

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Snap-Plus Nutrient Application Planner

Farm nutrient source availability

Values are for first year available nutrients in lbs/ton or lbs/1000 gallons

By Season

Souce name	Nutrient type	Units	N	N incorp	P2O5	K2O	S	Available annual volume	Planned applications	Remaining volume
Beef graze	Beef, grazing	Tons	4.0	5.0	5.0	9.0	1.0	539	286	253
							Total solid:	539	286	253
							Total liquid:	0	0	0

Field: H North Pasture Acres: 32 Crop: Pasture, rotationally grazed, grass/leg N P2O5 K2O

Year: 2013 Field Over(+)/Under(-) Application (lbs/acre) 36 45 -12

Field Application Restrictions: N Winter Slope SWQMA Groundwater Conduit Other

View Field Restrictions

Manure / Biosolid Applications

Add nutrient app | Delete nutrient app | Crop Year: Fall 2012 - Summer 2013.

Season	Source name	Spread method	Rate	Units	App-lied
Winter	Beef graze	Grazing	9.0	T/A	☐

Fertilizer Applications

Add fert app | Delete fert app

Season	Fertilizer Name	Spread method	Rate	Units	App-lied
					☐

No winter spreading on slopes steeper than 12% or on uncontoured slopes between 9 and 12%.

Please explain non-compliant applications:

Clear Text

Apply | Close | Help

Snap-Plus 1.132.8

File Edit Tools Reports Options Help

Farm | Field | Soil Tests | Nutrient Sources | Cropping

Field Name: H North Pasture

Subfarm:

Rotation Wizard | NPM Fast Facts | Calculate all years

County	Acres	Slope	Soil Name	Symbol	Restrictions	Soil Group	Soil Text
WI-Iowa	32	22	NORTHFIELD	NsE2	YES ?	E	LOAM

2014 soil test date: 10/4/2012 — pH 7.1 | OM % 3.0 | P (ppm) 33 | K (pp 72

First Year | Page Back | Prev Year | Next Year | Page Fwd | Last Year

Field notes:

	2012			2013			2014		
Crop:	Pasture/dry lot, spars			Pasture/dry lot, spars			Pasture/dry lot, spars		
Yield Goal:	0-0			0-0			0-0		
Tillage:	None			None			None		
Soil Test Date:	10/4/2012			10/4/2012			10/4/2012		
Lime Rec:	NA			0			0		
Irrigation / MRTN info:	Irrigated			Irrigated			Irrigated		
Season notes:									
(lbs/acre)	N	P2O5	K2O	N	P2O5	K2O	N	P2O5	K2O
Recommendation:	0	0	0	0	0	0	0	0	0
Prior years' extra:		0	0		96	87		141	84
Adjusted recommendation:	0	0	0	0	0	0	0	0	0
1st & 2nd year legume credit:	0			0			0		
Ext. manure credits (unused):	0	0	0	0	0	0	0	0	0
This year's manure:	77	96	173	36	45	81	36	45	81
This year's fertilizer:	0	0	0	0	0	0	0	0	0
Total credits & applications:	77	96	173	36	45	81	36	45	81
Over(+)/Under(-) adj UW rec:	77	96	173	36	45	81	36	45	81
Annual Total PI ☑ Details	71			53			54		
Particulate PI:	61.7			48.9			50.7		
Soluble PI:	9.2			3.8			3.0		
Acute loss (frozen) PI:	2.5			2.2			2.4		

It is about P source and delivery

Rotation Settings

3 year crop rotation starting in 2012

Contouring: None | On contour | Strip cropping

Filter stri: None | Desig field | Desig in-fie

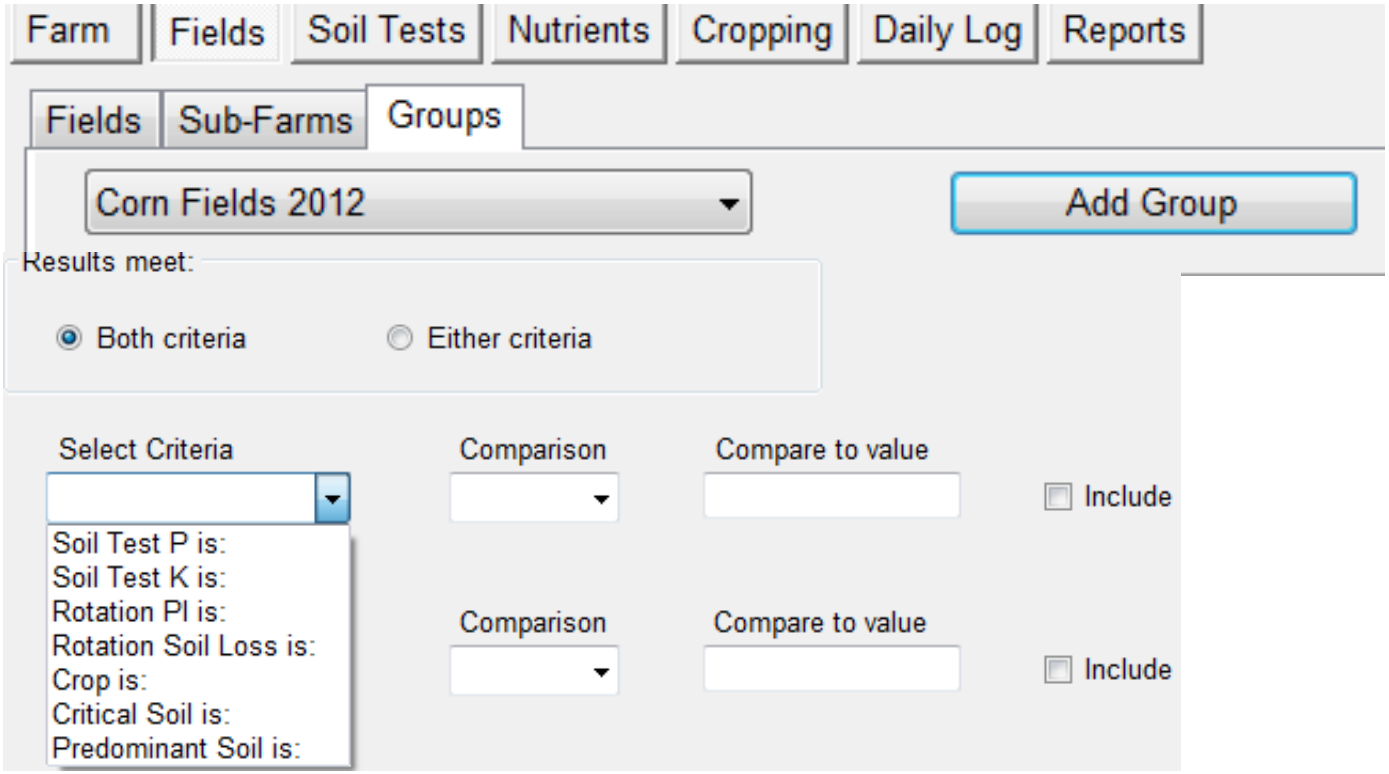
Rotation Summa Results 2012 - 20

Avg soil loss	37.2	t
Field "T"	2	t/ac
Avg P Index	59	
P2O5 removal	0	lb/a
K2O removal	0	lb/a
P2O5 balance	186	lb/a
K2O balance	335	lb/a

Soil test P is 50 or less so no P2O5 balance target is neede

Simplifying NM planning and applications with Ver. 2 of Snap Plus

- 1 file for 1 database
- Query fields for Groups



Will include UWEX A2809 updates from November 2012

Ver. 2 More flexible soil testing based on SAMPLE size, not FIELD size

Old Snap FIELD size

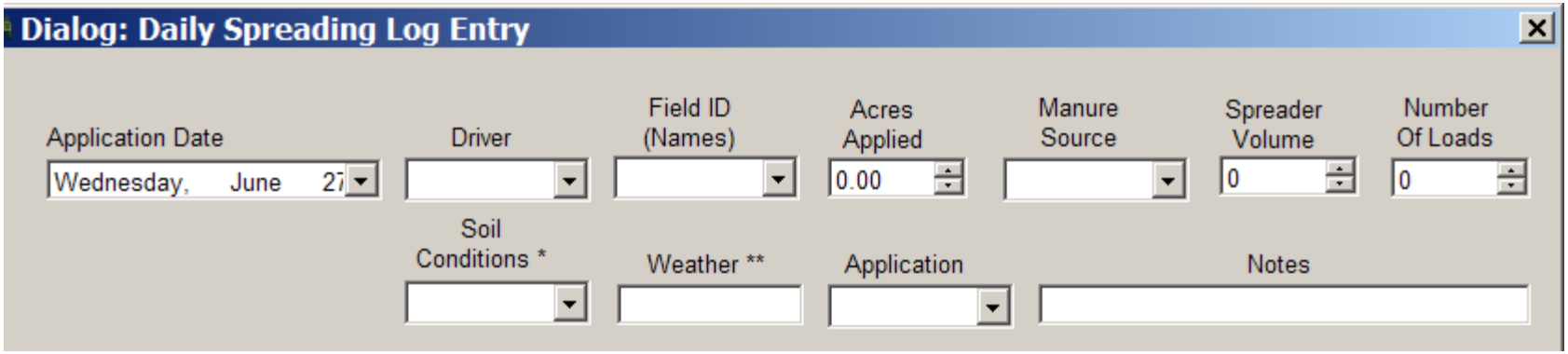
- 25.5 acre field needs 6 samples (rounded up to a 26 acre field)

Snap Plus V2 looks at Sample size

- a 27-acre field will require 5 samples (27/5 =5.4 rounded to 5).
- Fields that have tested very high or excessively high for both P and K in the last four years need fewer samples according to UW-Extension sampling guidelines.
- Snap Plus' **Soil Sample Log Report** indicates the recommended number of samples per field and helps maintain the exact field names for the new results when resampling.

42% (22 of 53) of the plans followed the 5 acre per sample, every 4 years soil testing requirement on every field, equal to last year.

SnapPlus V2 Daily Spreading Log



Importing your spreading data into Snap Plus from an Excel worksheet similar to DNR Daily Spreading Log for farms with DNR CAFO permits

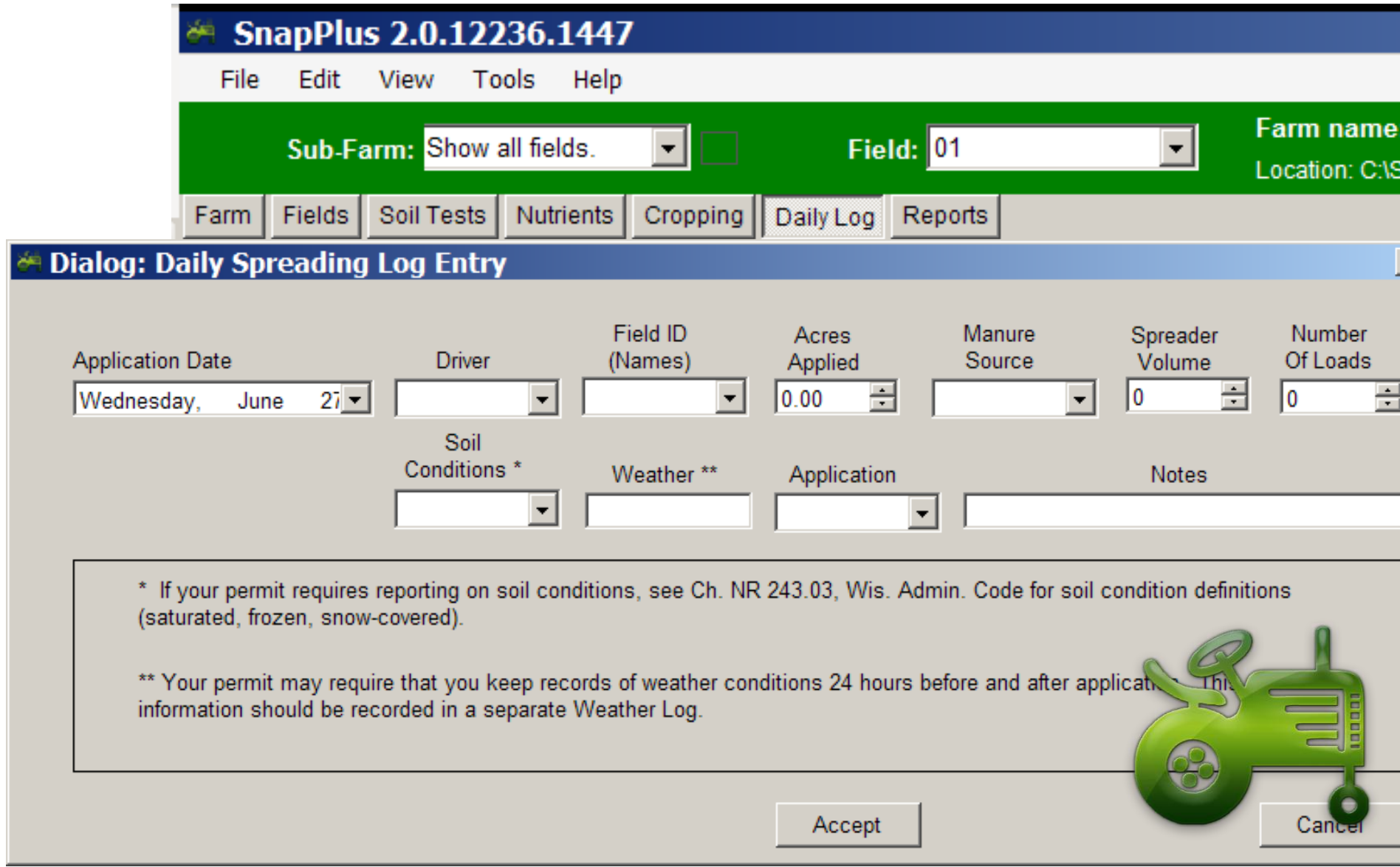
- Application Date
- Driver
- Field ID (Snap Plus field name)
- Acres Applied
- Manure/Process Wastewater Source
- Spreader load Volume or weight
- Number of Loads
- Soil Conditions (saturated, non-sat., frozen, snow)
- Weather During Application (temp & precipitation)
- Application (Inject, Incorporated, or Surface)

Predominant Soil

N rate follow predominant soil if entered

unty	Soil Map Symbol (critical)	Soil Series Name (critical)	Soil Map Symbol (pre-dominant)	Soil Series Name (pre-dominant)	Re striction Features	Field Slope (%)	Field Slope Length (ft)
yette	EdC2	EDMUND	TaB2	TAMA	yes	9	174
yette	TaB2	TAMA	TaB2	TAMA		4	250
yette	CaA	CALAMINE	CaA	CALAMINE		1	249
yette	EdC2	EDMUND	TaB2	TAMA	yes	4	249
yette	AsD2	ASHDALE	AsB2	ASHDALE		4	250
yette	AsB2	ASHDALE	AsB2	ASHDALE		4	280

Daily Spreading Log for CAFOs



Grazing Herds

Crop Year: 2010

Nutrient sources | Manure production estimator | Animal Units calculator | Grazing herd setup

Add herd | Delete this herd

Grazing/gleaning herd: Heifers

Animal group: Dairy

Add Animal | Delete Selected Animal | View grazing rate estimator

Animal Type	Number of Animals	Daily Manure Production (lbs/animal)	Total Daily Manure Production (lbs/day)
Dairy Heifer 1000 lbs	15	82	1230

Total daily production (all animals): 0.6 tons/day

Grazing Manure Application Rate Estimator

Dialog: Grazing Estimator

Grazing application rate estimator

☑ Use herd information to fill daily manure production (optional)

Crop year: 2010

Herd name: Heifers

Total daily herd manure production: 0.6 tons/day

Field/Pasture size: 22.0 acres

Days on pasture: 365 days

Percent of each day spent grazing: 100 %

Estimated application rate: 10.2 tons/acre

Calculate

Survey Simplifying NM Planning Suggestions from 97 CAFOs

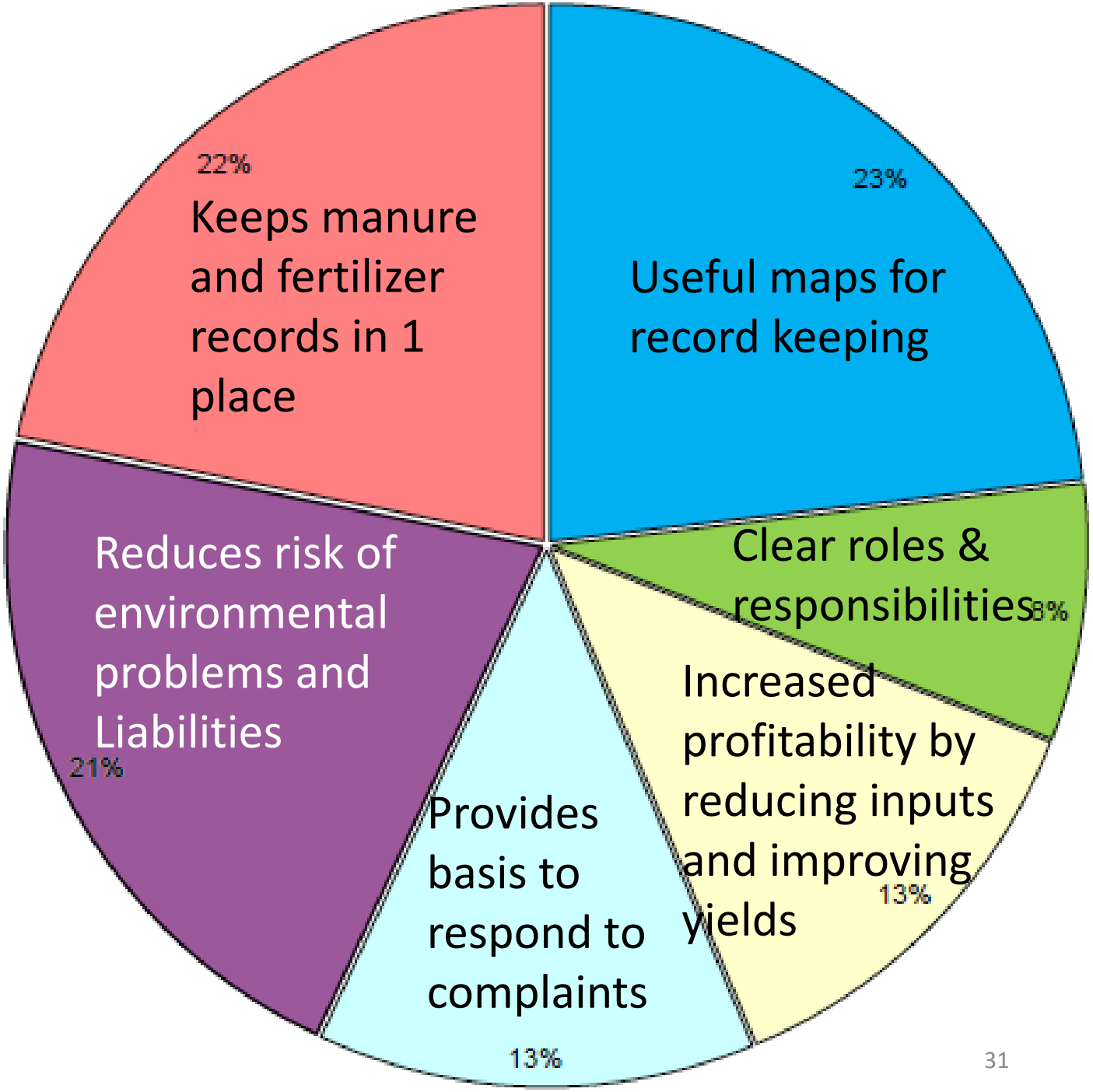
CAFO owners find their NMPs moderately to very easy to implement

- they update them regularly
- are supported by their consultant in understanding and implementing the plan and they recognize that the NMP serves several important functions

Important improvements could be

- better tools for recordkeeping
- electronic options for submittal & updating
- field maps that include setbacks and application rates
- a simple user interface so farmers could update the plan themselves

What CAFOs Liked Most About Their NMP



Simplifying NM Planning

Suggestions from Agronomists for Cons. Staff

- Shoot C slopes verify soils and assist with contouring
- Planning and installing waterways
- Look for substantial compliance
- Use management to fix issues

Summary

- More acres are implementing NM plans because of the Farmland Preservation Program and CAFO permits
- SNAP Plus helps farmers keep 590 NM plans flexible and updated with current soil loss for improved water quality and profitability
- ATCP 50 rule revision and hearings coming
- Snap Plus Ver.2 training at WCMC
- New maps will be released with Snap Plus Ver.2

For NM information

http://datcp.wi.gov/Farms/Nutrient_Management/Planning/index.aspx

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