

Nutrient management glossary

590 restrictions: Nutrient application restrictions from the 590 standard, which include winter spreading, surface water quality management area (SWQMA), fall nitrogen application, set-backs from conduits to groundwater, and other restrictions.

Adjusted UW recommendations: P₂O₅ and K₂O recommended by University of Wisconsin for that crop and soil test minus the P₂O₅ and K₂O carryover since the last soil test.

Concentrated flow channel: Areas within or on field edges where water flow channelizes and can erode soil.

Cropping year: For a field, the new cropping year starts after the previous crop has been harvested and spans the time to the next harvest. For example, if a winter wheat field is harvested in July 2013 and manure is applied following the harvest, then the manure application would be included in the 2014 cropping year (same for any fertilizer applications or tillage following harvest).



Note: This example shows single crops with general harvesting/planting dates. See **A Guide to SnapPlus crop abbreviations** for more variations on crops combinations.

Dominant critical soil: The most erodible soil type that covers at least 10% of the field. Used to determine soil loss and the P Index in SnapPlus.

Field "T": Tolerable soil loss (the amount the field can lose in tons/acre/year) as determined by soil type.

Filter areas: A grass strip within a field or an area on the edge of a field designed to capture sediment in runoff. These selections in SnapPlus assume there are no concentrated flow channels through the grass filters.

N restricted soil: Soils that have the potential for nitrate leaching to ground water. Definition of symbols: (P) High permeability soils, (R) Less than 20 inches to bedrock, (W) Less than 12 inches to apparent water table, (+) This map unit may have any of the N restrictive features, however an on-site investigation is needed to identify which restrictions may actually be present.

On-contour: A field that is consistently planted and tilled on the contour across the slope.

P Index: The Wisconsin Phosphorus Index, a planning tool used to rank fields by runoff P loss potential. Annual total PI is calculated by estimating the average annual runoff P delivery from a field to surface water. Particulate PI is an estimate of P delivered with eroded sediment, and Soluble PI is an estimate of dissolved P delivered from soil and nutrient applications.

Spread method: Unincorporated—broadcast on surface with more than 72 hours before tillage; Incorporated—surface-applied and incorporated into soil by tillage or infiltration; Injected (manure)—injected below soil surface or incorporated by tillage within 1 hour; SubSurface (fertilizer)—applied below the soil surface; Grazing (manure)—deposited directly from the animal.

Soil condition Index (SCI): A positive number indicates soil organic matter is likely increasing across the rotation, while a negative number indicates it is likely to be decreasing.

Strip crop: Contour strips of alternating row and hay crops. Assumes at least two strips on the field slope length.

SWQMA: A Surface Water Quality Management Area is an area within 300 ft of a perennial stream/river or 1,000 ft of a lake/pond.

SnapPlus Tip: If you save an archived .snapDB files on your PC and send it as an email attachment, the data in the file cannot be altered in any way. **It is read-only.**

Finding and fixing 590 issues in SnapPlus

Issue list is for **non** WPDES-permitted farms (CAFOs). CAFOs have more compliance issues that are not listed in this publication.

- 1 Run the Compliance Report for the plan year and rotation.
- 2 If problems are listed for the plan year and rotation, first go back and check that the information entered for the fields and years is correct (problems listed for previous years do not need to be addressed). Then review the following sections for suggestions to common problems. **When making adjustments to reach compliance, be sure that the solutions can be implemented.**
- 3 For more help with specific compliance issues, consult the resources listed below and/or contact DATCP or your local land conservation department (LCD).

SnapPlus Tip: Selecting a P strategy

- 1 If soil test P levels are already below 50 ppm, select **Soil Test P** to maintain P levels at their current state.
- 2 If soil test P levels are at or above 50 ppm, select **P Index** to allow for higher P applications on crops as long as there is no risk for P loss on the field.
- 3 Select both to ensure optimum P levels and lower environmental risk.

COMPLIANCE REPORT ANATOMY

ROTATIONAL RESTRICTION PROBLEMS:

- Rotational P₂O₅ balance target is exceeded (only applies to Soil Test P method)
- Rotational soil loss is too high
- Rotational average PI is too high (rotational PI cannot exceed 6)

MISSING INPUTS: Summarizes any missing inputs that are needed to run the report.

SOIL TEST PROBLEMS:

- Soil test sample density has too few samples (<1 sample per five acres)
- Soil test data is too old (soil test results for plan year need to be < 4 years old)

APPLICATION RESTRICTIONS: Application restrictions are listed by field and year.

- Overapplication of manure or fertilizer N
- No winter spreading on slopes steeper than 12% or on uncountoured slopes between 9 and 12% (make sure you check Contouring in the Rotation Summary if applicable)
- Local restrictions may prohibit winter spreading (local prohibitions for winter applications box is checked in Field Restrictions dialog box)
- Winter spreading rate must be less than 7,000 gallons/acre
- Planned rate is too high for single, unincorporated liquid manure application in SWQMA
- Planned unincorporated application in SWQMA is not likely to have 30% canopy cover or residue for runoff reduction, and no filter strips or cover crops are planned
- Winter applications prohibited within SWQMA
- One or more applications are not compatible with None or No till selected (this is not actually a restriction, but shows up as a warning)

ROTATIONAL RESTRICTIONS: If rotational soil loss is too high, make adjustments in the future to reduce soil disturbance and increase residue or year-round cover (i.e. reduce tillage, leave fodder on field, use cover and nurse crops, add grasses to alfalfa mix, move silage around to different fields). If rotational PI is too high, look at the annual PI rows at the bottom of the cropping screen or in the Annual PI report. If particulate P is high, then reduce soil loss using strategies listed above. If soluble P is high, then avoid winter manure applications, reduce application rates, or incorporate manure.

MANURE-RELATED RESTRICTIONS: To address most problems, move applications during times of the year with increased run-off or leaching potential to different fields and/or reduce or eliminate applications. For fields in SWQMAs, move winter manure applications to summer, spring, or fall. If not possible, then spread at least 300 ft from streams/riders and 1,000 ft from lakes/ponds. These problems will cause **orange highlights** in This year's manure or This year's fertilizer.

P-RELATED RESTRICTIONS: If soil tests are in the non-responsive range, then do not apply commercial P fertilizer with the exception of 20 lb of P₂O₅ in a starter fertilizer. When applying manure in winter, do not exceed the next year's crop P removal. These problems will cause **orange highlights** in This year's manure or This year's fertilizer.

N-RELATED RESTRICTIONS: For most problems, reduce manure or fertilizer applications for the field. If it is an N restricted soil, do not apply commercial N fertilizer in the fall, including any N that is part of a P or S-related fertilizer (i.e. DAP). See Excessive Nitrogen Applications on page 2 for more information. These problems will cause **red highlights** in This year's manure or This year's fertilizer cells.

GROUNDWATER RESTRICTIONS: Manure and fertilizer (N and P) cannot be spread without incorporation within 200 ft upslope of a conduit to groundwater (incorporated or sub-surface applications are acceptable). For residential wells, manure cannot be spread within 50 ft. Move these manure applications to different fields. These problems will cause **orange highlights** in This year's manure or This year's fertilizer.

- Winter manure P₂O₅ applications exceed this year's crop removal
- Annual PI > 12 (annual PI cannot exceed 12)
- Excess fertilizer P₂O₅. More than the entire P₂O₅ recommendation for the planned rotation on this field has already been applied as manure or fertilizer

- Overapplication of manure or fertilizer N
- No fall fertilizer N can be applied to this crop on soils with a high N-leaching potential
- This field has fall or late summer N applications in excess of what is allowed for soils with a high N-leaching potential

- Farms are not allowed to apply manure within 50 feet of a drinking water well
- Unincorporated or grazing applications upslope of conduits to groundwater: sinkhole, fractured bedrock, tile inlet, well within 200 feet, or other conduit

EXCESS N: Summarizes any excessive N applications by field and year.

SnapPlus

Version 2014

Wisconsin's Nutrient Management Software

fast facts

SnapPlus Tip: For the fastest response to SnapPlus questions: email support@snapplus.wisc.edu

View SnapPlus tutorial videos at snapplus.wisc.edu View NPM publications & videos at ipcm.wisc.edu

8 basic steps to developing a new nutrient management plan using SnapPlus

- 1 Install SnapPlus version 2.0
- 2 Create a new farm
- 3 Import your farm's soil tests
- 4 Enter field information
- 5 Enter nutrient sources
- 6 Enter crop and nutrient application information
- 7 Run reports
- 8 Archive your files

Archive saves a zipped database with a time-stamp appended to the name. Recommended for saving a database for historical/reporting purposes.

5 basic steps to updating a nutrient management plan using SnapPlus

- 1 Add any new field, crop, soil test, or nutrient information
- 2 Click on File>Save Snapshot
- 3 Update crop and nutrient application information for multiple years and fields using the Rotation Wizard. If you make a mistake, you can select File>Revert to Last Snapshot to start again.
- 4 Run reports
- 5 Archive your files

Save Snapshot allows you to save the database at a specific point in time. This gives you the option to revert the file back to that point during a session if needed. **You can save multiple snapshots.**

SnapPlus tillage codes and explanations

SnapPlus uses the most soil-disturbing tillage options available in the RUSLE2 database for each primary tillage category. If you meet "T" with SnapPlus, then you are protecting the field from excess soil erosion. Fall and spring chisel and moldboard options listed include secondary tillage.

Code	Tillage	RUSLE2 operations (assumptions for soil loss calculations)
FCD 3-pass	Fall chisel, disked	Fall chisel plowing (twisted shovel) with spring disking (tandem) and field cultivation before planting.
FCND 2-pass	Fall chisel, no disk	Fall chisel plowing (twisted shovel) and field cultivation before planting.
FP 3-pass	Fall moldboard plow	Fall moldboard plowing with spring disking (tandem) and field cultivation before planting.
FVT 2-pass	Fall vertical tillage	Fall pass plus a spring pass with same seedbed conditioner: double gang coulter caddy, rotary harrow, and rolling basket incorporator.
NT	No-till	No soil disturbance except for planter using a double-disk opener and fluted coulter.
SCD 3-pass	Spring chisel, disked	Spring chisel plowing (twisted shovel) followed by disking (tandem) and field cultivation before planting.
SCND 2-pass	Spring chisel, no disk	Spring chisel plowing (twisted shovel) and field cultivation before planting.
SFC 1-pass	Spring cultivation	One field cultivation before planting, use for most 1-pass systems.
SP 3-pass	Spring moldboard plow	Spring moldboard plowing followed by disking (tandem) and field cultivation before planting.
ST	Strip-till	No soil disturbance except for 30% of the surface at planting with a strip-till planter.
SVT 1-pass	Spring vertical tillage	Spring pass using a seedbed conditioner with a double gang coulter caddy, rotary harrow, and rolling basket incorporator.

SnapPlus Tip: Tillages should be entered by cropping year, not calendar year (see the glossary for full explanation).

Excess nitrogen applications (No flag will occur until >9 lb N/a over the maximum allowable amount)

MAXIMUM ALLOWABLE NITROGEN APPLICATION FOR CORN	
The maximum allowable N rate for corn is set at the high end of the range for the 0.05 Corn: N price ratio. These are the highest N rates in the UW-Extension guidelines and are recommended where manure and legume credits provide all the corn crop's nitrogen needs.	
Soil group: Yield potential	Maximum N rate (lb/a) ¹
Previous crop	
Loamy: High yield potential soils	
Corn, forage legumes, legume vegetable, or green manures	210
Soybean or small grains	160
Loamy: Medium yield potential soils	
Corn, forage legumes, legume vegetable, or green manures	160
Soybean or small grains	150
Sands/loamy sands	
All crops-irrigated	230
All crops-not irrigated	150

¹ Includes Legume credits, Manure credits, This year's manure and This year's fertilizer.

Note: If the entire amount shown here is supplied through organic sources, some starter N fertilizer (up to 20 lb N per acre) can be applied before the SnapPlus warning notices are given.

Nutrient Management Resources:

NPM Understanding Soil Phosphorus

(<http://ipcm.wisc.edu/download/pubsNM/UnderstandingSoilP04.pdf>)

NPM Nutrient Management Fast Facts

(<http://ipcm.wisc.edu/download/pubsNM/NutrientManagementFastFacts.pdf>)

NPM Management Options for Farms with High Soil Test Phosphorus Levels

(<http://ipcm.wisc.edu/download/pubsNM/PMngmtOpt.pdf>)

UWEX A2809 Nutrient Application Guidelines for Field, Vegetable, and Fruit Crops in Wisconsin

(<http://learningstore.uwex.edu/assets/pdfs/A2809.pdf>)

SnapPlus Tip: To adjust UW recs to reflect current soil nitrate test results, go to the Cropping Screen and click on a cell in the UW Recommendation row to open the Nutrient Recommendation Details dialog box. Click on the cell in the Adjustment row to record the new data.

SnapPlus Tip: The **Grazing herd estimator** can be opened by clicking on the Grazing Est. button, which is located on the Grazing Herd Setup tab (Nutrients Screen) or the Nutrient Application Planner. To open the planner, clicking on any cell in This year's manure or This year's fertilizer (Cropping Screen).

SnapPlus Tip: To record liming info, go to the Cropping Screen>Click on a cell in Lime Rec row.

MAXIMUM ALLOWABLE NITROGEN APPLICATION FOR WHEAT		
Soil group	Maximum N rate (N lb/a) ¹	
	Previous crop	Winter wheat
Loamy ²		
Corn, forage legumes, legume vegetable, or green manures	85	75
Soybean or small grains	65	55
Sandy (sands/loamy sands)-All crops	115	105
Organic -All crops	0	0

² Soils in the loamy group that have less than 2% organic matter (OM) use the sandy group maximum allowable N rate. Loamy soils with greater than 10% OM have maximum allowable N rates that are 30 lb N per acre lower than those shown in the table.

MAXIMUM ALLOWABLE NITROGEN APPLICATION FOR CROPS OTHER THAN MRTN OR LEGUME CROPS	
	Maximum N rate (N lb/a) ¹
All N from manure/legume credits	1.2x UW recs
Commercial N	UW recs

MAXIMUM ALLOWABLE 1 ST YEAR MANURE NITROGEN APPLICATION RATES FOR LEGUME & (LEGUME + COMPANION) CROPS ³		
	Yield range	Manure N allowed
		(lb/a) ¹
Alfalfa, alfalfa with brome, red clover, or birdsfoot trefoil; established	2.6-3.5 ton	170
	>3.6 ton	220
Alfalfa, alfalfa with brome, red clover, or birdsfoot trefoil; seeding	no harvest	60
	1.0-2.5 ton	170
	2.6-3.5 ton	220
	3.6-4.5 ton	280
Barley with alfalfa, alfalfa with brome, or red clover seeding	25-50 bu	150
	51-75 bu	180
	76-100 bu	210
Dry beans	10-20 cwt	60
	21-30 cwt	100
	31-40 cwt	140
Oats with alfalfa, alfalfa with brome, or red clover seeding	30-60 bu	150
	61-90 bu	170
	91-120 bu	190
Pasture seeding, grass with legume, or legume more than 30%	0.5-1.9 ton	80
Pasture, not-rotational or rotational, grass with legume, or legume more than 30%	2-3 ton	110
	3.1-4.0 ton	150
	4.1-5.0 ton	200
Small grain silage underseeded with alfalfa, Small grain and legume silage, or Small grain and legume silage underseeded with alfalfa	2-3.5 ton	220
Soybean	15-25 bu	80
	26-35 bu	120
	36-45 bu	160
	46-55 bu	200
	56-65 bu	240
	66-75 bu	280
	76-85 bu	320

³ Some SnapPlus legume crops such as peas and snap beans are not included in this table because N removal in the harvested portions of the crop is similar to their N fertilizer recommendation.

A guide to SnapPlus crop abbreviations

SnapPlus Tip: When creating rotations in the Rotation Editor, enter the abbreviations. The full crop names will automatically be entered into the table.

SnapPlus crops are based on a crop year that generally runs from the day after the fall harvest to the next fall's harvest, with some variation for crops that do not fit this schedule. When two crops are planted or harvested in a single crop year, it is a double crop. If one of the crops grown is not harvested, then it is a cover crop. If an annual crop is used to assist in the establishment of a perennial crop, it is a nurse crop. Below is the syntax used in the different cropping systems. Note that these combinations must already exist in SnapPlus. A full list of available cropping systems is listed on the Farm Screen.

- double crops use brackets and a dash: **[F-Sg]**
- cover crops (or straw) use a plus sign: **Csl+cv**
- nurse crops and perennial crops are typed together: **BfAs**
- the syntax can be combined (i.e. **[PE-CU]+cv**)

A Alfalfa
F Alfalfa (1st cut) to Corn grain
Ag Alfalfa (grassy, yr 3+)
Asls Alfalfa seeding fall
As Alfalfa seeding spring
Afk Alfalfa, fall killed
AB Alfalfa/Brome
ABsIs Alfalfa/Brome seeding fall
ABs Alfalfa/Brome seeding spring
ABfk Alfalfa/Brome, fall killed
AG Alfalfa/Grass
AGsIs Alfalfa/Grass seeding fall
AGs Alfalfa/Grass seeding spring
AGfk Alfalfa/Grass, fall killed
acv Annual cover crop
AP Apple
APe Apple, establishment
AS Asparagus, established
AS Asparagus, planting
AS Asparagus, year 2
Bf Barlage to Sorghum-Soybean
Bg Barley
BT Beets table
BL Blueberry
BLe Blueberry, establishment
BF Brassica forage
BR Broccoli
BRU Brussels sprouts
BU Buckwheat
CRP CRP
CB Cabbage
CN Canola
CR Carrots
CA Cauliflower
CE Celery
CH Cherry
ChE Cherry, establishment
Cg Corn grain
Cg18 Corn grain, 18 inch rows
Cg18bs Corn grain, 18 inch rows, baled stalks
Cgbs Corn grain, baled stalks
Cp Corn popcorn

Csl Corn silage
Csl18 Corn silage, 18 inch rows
Cs30 Corn silage, 30 inch rows
CU Cucumber
Bnd Dry beans
Fs Direct seeded Legume Forage
FL Flax
GN Ginseng, established
GN Ginseng, harvest year
GN Ginseng, planting year
GH Grass hay
GHs Grass hay, seeding
Gnh Grasslands, permanent, not harvested
HP Hop
IL Idle land
IR Interseeded rye cover
Lsl Legume silage
Icv Legume cover crop, underseeded
Lcv Legume cover crop, interseeded
LE Lettuce
LB Lima bean
ME Melon
ML Millet
MT Mint, established
MT Mint, seeding
Of Oatlage
OPf Oat-Pea Forage
Og Oats
Og+s Oats grain plus straw
ON Onion
Psg Pasture seeding, grass
Psl Pasture seeding, grass/legume
PsmI Pasture seeding, legume more than 30%
Pu Pasture, continuous stocking, high density
Pcl Pasture, continuous stocking, low density
Pdl Pasture, dry lot, exercise area
Prg Pasture, rotational stocking, grass
PrI Pasture, rotational stocking, grass/legume
PrI>30 Pasture, rotational stocking, legume more than 30%
Pg Pasture, variable stocking, managed continuous
PI Pasture, variable stocking, managed continuous, grass/legume
PI>30 Pasture, variable stocking, managed continuous, legume more than 30%
PF Pea, field
PE Peas
GP Pepper
POe Potatoes, early harvest
POe+cv Potatoes, early harvest, to small grain cover crop
POI Potatoes, late harvest
PU Pumpkin
RA Raspberry
RAe Raspberry, establishment
RC Red clover
RCcv Red clover cover crop, interseeded
RCg Red clover (grassy, yr 3+)
RCss Red clover, seeding spring
RC Red clover, fall killed
SB Snapbean
SBe10 Snapbean, early plant, less than 10 inch rows
SBe30 Snapbean, early plant, 30 inch rows
SBl10 Snapbean, late plant, < 10 inch rows
SBl30 Snapbean, late plant, 30 inch rows
SG Small grain
SGsl Small grain, silage
cvr Small grain, cover
cv Small grain cover crop, not harvested
SD Sod, established
SDh Sod, harvest year
SDs Sod, seeding, fall
SDs Sod, seeding, spring
Sf Soybean forage
SGf Sorghum-sudan forage
Sg15 Soybean 15-20 inch rows
Sg30 Soybean 30-36 inch rows
Sg7 Soybean 7-10 inch rows
SP Spinach
SQ Squash
SRg Sorghum, grain
s Straw
s7 Straw 7-10 inch rows
s15 Straw 15-20 inch rows
s30 Straw 30-36 inch rows
ST Strawberry, established
STp Strawberry, planting
SU Sunflower
SC Sweet corn
SCe Sweet corn, early plant (before May 20)
SCI Sweet corn, late plant (June10 or Later)
SCm Sweet corn, middle plant (May 20-June 10)
SW Switchgrass
SWs Switchgrass, seeding
T Tobacco
TM Tomato
BFT Trefoil, birdsfoot, established
BFTs Trefoil, birdsfoot, seeding
TRgs Triticale (winter) grain plus straw
TRg Triticale (winter), grain
Wsg Wheat spring
Wsg+s Wheat spring grain plus straw
Wwg Wheat winter
Rwf Winter rye (forage)
Rwg Winter rye
SGwsl Winter small grain silage
TTwf Winter triticale (forage)
Wwf Winter wheat (forage)
Wwg Winter wheat (grain)

Speedy ways to update and fine-tune crop management information:

View>Nutrient Applications by Season to find out if the plan distributes all manure when it is available, so storage capacities will not be exceeded.

Fields>Groups to designate a group of fields that need the same updates. Groups can be selected in the Rotation Wizard.

Daily Log to update planned manure applications with actual application rates used.

Tool>Rotation Wizard to make changes across multiple fields and/or crop years.

Changes to make	Rotation Wizard selection
Crop, yields or tillage	
Legume stand information for N credits	Change existing ... >Cropping data
Add season notes	
Add/delete manure or fertilizer application	Change existing... >Application
Remove a single manure or fertilizer application Note: Enter application information and set rate to 0.	Change existing>Application>Edit existing
Spread method or rate for a planned application	
Delete crop years	Delete crop and application data...
Contouring or filter strips	
Rotation length and start year	Edit rotational settings for fields
Price ratio or range point for MRTN crop N recs	Edit MRTN data for fields

Groups can be used to logically organize fields by any means that might be useful. **Fields may be in more than one group.** Groups can also be used to reduce the number of fields displayed on the Fields tab or in the Rotation Wizard.

Sub-farms can be used to identify fields that are located together geographically, fields that share the same manure sources, or rented fields with the same owner. **Fields may only be in one sub-farm.**