

SnapPlus Prep

Understanding the information you need to write a nutrient management plan using SnapPlus software

Developing a nutrient management plan using SnapPlus software can be easy when you understand and have compiled all the information you need before sitting down in front of a computer.

This publication is designed to help you understand what steps are involved in developing a new plan and what information you will need for each step. Words **in this font** are defined in the glossary on the back page. Note that if you are a **WPDES**-permitted farm, some of the things you will need are not covered in this publication. There is also a checklist to help you keep track of what information you have or will need to obtain (helpful resources are included). The good part is once you have your farm set-up in SnapPlus, updating it in future years is a Snap! This publication is going to focus on the information you will need to gather for steps 2-6 in the eight basic steps.

Quick Overview

Starting with step 2, the information you will need to for this step is fairly straight-forward. You will need to enter the farm name along with some contact information and choose if you want to use 2nd or 3rd year **Manure nutrient credits**. You will need to select from lists both the county (or counties) that your farm is in and what crops you grow.

In step two, there are two text boxes, the Farm narrative and the **Concentrated flow channel** protection, where you can type a short description. The Farm narrative gives you a chance to explain any unique aspects of your farm or components of the plan that you need to highlight. If you have any channelized flow areas on your farm, you can explain how they are protected. You can return to these text boxes at any time to add details.

For step 3, you will need your farm's soil test results. You can enter them by hand in SnapPlus, but it is much easier to import them from a **DATCP**-certified lab's electronic file. If you haven't soil sampled yet, then be sure to check out the University of Wisconsin resources listed under Step 3 on the next page.

In step 4, you will enter or select information about your fields. Some items will automatically fill-in based on the soil test results entered in step three. To complete the information for some of the columns, you will need spreading restriction maps for your farm (see the checklist for how to obtain these). These maps will help you determine the **Soil map symbol** for the **Dominant critical soil type** and the **Predominant soil type** for each field. The maps will also indicate if you have any spreading restrictions that need to be indicated in SnapPlus.



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The Eight Basic Steps

- 1 Install SnapPlus software (available at snapplus.wisc.edu)
- 2 Create a new farm file
- 3 Import your farm's soil tests
- 4 Enter field information
- 5 Enter nutrient sources information
- 6 Enter crop and nutrient application information
- 7 Run SnapPlus reports
- 8 Back up your files

For each field, the **Below field slope to water** and **Distance to perennial water** need to be selected. These are both used to calculate the **P index**. To estimate the distance to perennial water, you can use the scale on the map. The below field slope to water should describe the average slope percentage from the edge of the field to perennial water. You can use the **Slope class** for guidance. Use the dominant slope class of the area between the field and perennial water.

Step 5 is where you enter all the manure and fertilizers that you use on the farm. There are a few calculators available to help you estimate manure volumes by entering the number of animals per size class or by grazing animal numbers. You should also enter manure storage volumes and manure spreader calibrations on this screen.

For step 6, you will enter both crop and nutrient application information for all of your fields over an entire rotation. This is often the most challenging step in the SnapPlus process. For each field, you will need crop, yield goal, tillage, and nutrient applications for each year in the rotation.

During this step, you will be able to see if you are currently over or under the University of Wisconsin recommendations for nutrient applications on your fields. You will also be able to calculate the P Index and **Soil loss** for your fields. These are important calculations if you are submitting a plan that needs to meet the **590 standard**. You will also have the opportunity to adjust future nutrient applications and run different crop rotation scenarios on your farm.

SnapPlus Prep Checklist

▶ video, 📄 publication and 📖 website links listed on the back page

Step 2. Create a new farm file

▶ SnapPlus: Starting a SnapPlus Farm and Completing the Farm Screen

- ❑ **Farm name and contact information.**
- ❑ **County (or counties) that your farm is in.** There is a list that you can select from.
- ❑ **Crops grown on your farm.** There is a list that you can select from.
- ❑ **What manure credits to use.** There are three choices: 1) Do not use 2nd and 3rd year credits. 2) Use 2nd year manure credits. 3) Use 2nd and 3rd year credits. A basic 590 plan is not required to use 2nd and 3rd manure credits. No second- or third-year credit is given for manure P or K. Any manure P or K applied but not credited in the first year, is best accounted for by subsequent soil testing.
📄 NPM Credit What You Spread
- ❑ **Farm narrative.** This is where you can explain components of the plan, manure handling, unique aspects of your farm, and any compliance concerns.
- ❑ **Concentrated flow channel explanation.** The 590 standard requires that these areas within fields need to be protected with perennial cover (i.e., establishing a grassed waterway).

Step 3. Import your farm's soil tests:

▶ NPM Basic Soil Sampling for Wisconsin Agriculture

📄 NPM Soil Testing Basics

📄 UWEX Sampling Soils for Testing, A2100

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

- ❑ **Electronic soil test results.** The easiest way to do this step is to obtain your soil test results in electronic form from a DATCP certified soil testing laboratory. If you haven't sampled yet, make sure your sample bags are clearly marked with a sample number and field number that matches your farm's map. The combination of these numbers must be unique for the farms samples. Be sure to take 10 cores for every 5 acre soil sample and sample at least every 4 years.
▶ SnapPlus: Importing Soil Samples into an Existing SnapPlus Database
- ❑ **Paper soil test results.** You can also enter the information by hand. If you do, you should skip to Step 4 and get your field information entered first. Enter soil test results for each field. However, it is highly recommended that you import the data electronically.

Step 4. Enter field information:

- ❑ **Field names and size in acres.** If you imported your soil test results in Step 2, then your field names and acreages will automatically be filled in. If you are starting a database prior to receiving soil sample results, you will have to enter each field manually (be sure to double-check the data for errors).
▶ SnapPlus: Completing the Field Screen—Part 1
- ❑ **Sub-farm.** If you are operating more than one farm, the use of the sub-farm feature may be helpful to you.
▶ SnapPlus: Completing the Field Screen—Part 2
- ❑ **Dominant critical soil map symbol for each field.** For this step, you will need a soil map for your fields. The dominant critical soil is the most erodible, usually the steepest, soil that occupies at least 10% of the field. This soil is used to determine the soil loss for the field and is used in determining the P Index. As an example if you have two soils in a field, DuC2 and DsD2, the second capitalized letter in the soil symbol represents the field slope. The slopes follow alphabetical order, A being no to low slope, F being a steep slope. Note: in SnapPlus, Dominant critical soil map symbol is written as Soil Map Symbol (Critical).
📖 Nutrient Applications Restrictions maps
📄 DATCP Choosing the Critical Soil Type
▶ SnapPlus: Completing the Field Screen—Part 2
- ❑ **Predominant soil map symbol for each field.** For this step, you will also need soil maps for your fields. The predominant soil is the **Soil series (name)** that occupies the majority of the field and is used when determining the N-P-K recommendation for the field.
📖 Nutrient Applications Restrictions maps
▶ SnapPlus: Completing the Field Screen—Part 2
- ❑ **Below Field Slope to Water.** You will need to estimate the average slope from the edge of the field to any perennial water.
▶ SnapPlus: Completing the Field Screen—Part 2
📖 Nutrient Applications Restrictions maps
- ❑ **Distance to the nearest surface water.** For this step, you will need maps that show perennial waters. It is important to note that the distance to the nearest surface water is a linear measurement along the route as the water flows, not as the crow flies.
📖 Nutrient Applications Restrictions maps
▶ SnapPlus: Completing the Field Screen—Part 2
- ❑ **590 Restrictions.** Location of soils and landscape features with seasonal or other application restrictions. For this step, you will need maps with the **590 Restrictions**.
📖 Nutrient Applications Restrictions maps
▶ SnapPlus: Completing the Field Screen—Part 3
- ❑ **Tiled.** Check the box for any field that is **Tile drained**.

Step 5. Enter nutrient source information:

- ❑ **Annual manure volume produced by species on the farm.** If you do not have this information, then you can calculate it in SnapPlus with the information below.
 - ❑ **Number of animals, sizes and % collected.** You will need to name each source by selecting the nutrient type from a list (dairy liquid, beef solid). Then you can use the manure production estimator to calculate the annual volume produced. You will need to have the number of animals and their respective sizes and what % of the manure is collected and available for spreading
- And/Or**
- ❑ **Manure storage volume(s) and/or loads spread.** For the most accurate estimation, your manure spreader should be calibrated.
 - 📄 NPM Know How Much You Haul
 - ▶ NPM Calibrating a Manure Spreader
 - ❑ **If you have a manure N-P-K and dry matter content analysis, you can enter it in this step.** If not, then book values will automatically fill-in.
 - ❑ **Fertilizers used on your farm.** You can select these from a list of either dry or liquid fertilizers. You can also add a fertilizer and analysis if it is not on the list.

Step 6. Enter crop & nutrient application information:

Special Note. SnapPlus calculations are based on **cropping years**, not calendar years. When entering tillage, manure and fertilizer applications on a field, be sure to enter them in the same cropping year they were performed in. For example, if you fall-chisel a field in 2013 following harvest and then plant corn in spring 2014, you would enter the fall chisel tillage in the 2014 cropping year.

▶ SnapPlus: Cropping Screen Basics

- ❑ **Current & planned crops, yield goals, and tillage.** For each field, you will need the entire crop rotation, yield goal for each crop and tillage used or planned for the current plan year. It is also recommended that you enter at least one year's prior data for each field.
- ❑ **Current & planned manure applications.** For each field, you will need the application rate, season of application, and application method (unincorporated, incorporated, injected, or directly by animals). Before planning applications, be sure to check whether planned manure applications align with the 590 Restrictions, specifically the winter spreading restrictions on slopes and near surface water. Also, verify that the fields chosen are the best options for optimizing manure with upcoming crop and current soil test levels in mind.
- ❑ **Prior year legume & forage stand condition.** For each field with a prior legume crop, you will need to know the

stand condition and amount of regrowth. These criteria are used to calculate **legume credits**.

📄 NPM Credit Legume Nitrogen and Reap the Profits

- ❑ **Current & planned fertilizer applications.** For each field, you will need to have the fertilizer type, application rate, season of application, and application method (unincorporated, incorporated, subsurface). It is recommended that you wait to add additional fertilizer applications after accounting for all manure and legume credits and adjusted field recommendations are shown.
- ❑ **Lime applications.** For each field that has been limed, you will need the neutralizing index, such as 60-69, and rate of the liming material applied.
- ❑ **Rotational settings.** You can adjust the settings to reflect what year your rotation starts and how many years the rotation lasts before repeating.
- ❑ **Contour farming and filter areas.** For each field, you will need to select whether the whole field is farmed **on-contour** or **contour strip-cropped** and whether the field has **filter areas** at the field edge or within the field.

Once you collect and understand all of the information from the checklist, you are ready to sit down and get started with SnapPlus.

SnapPlus has tools that can make data entry easier. The **Rotation wizard** can be used to enter multiple fields and years, instead of entering them field by field and year by year.

▶ SnapPlus: Using the Rotation Wizard—Part 1

▶ SnapPlus: Using the Rotation Wizard—Part 2

One suggestion for making your fertilizer plan easier to implement is to enter all necessary information, including crop rotations, legume credits and manure applications **before** entering any fertilizer applications. Once the on-farm nutrients are entered, you will be able to view the adjusted UW recommendations.

The NM Sorted by Crop Report is useful for viewing the adjusted UW recommendations by crop type. Often when determining fertilizer recommendations, fields are grouped so the number of fertilizer rates can be minimized. Fewer fertilizer rates can make implementation of the nutrient management plan easier, especially if the fertilizer is applied with a minimal amount of spreader mixes. Once fertilizer plans are determined, enter them into SnapPlus field by field using the nutrient application planner from the cropping screen, or enter many at one time by using the rotation wizard.

Step 7 Tip: To verify that all applications meet 590 requirements, run the *Compliance Check* report and make adjustments to your plan if necessary. Make reasonable adjustments to future rotations, tillage, or application rates /timing if any conservation compliance issues (i.e. **Field "T"** or P Index) arise.

Links to resources:

All NPM  &  can be viewed at ipcm.wisc.edu

All SnapPlus  can be viewed at snapplus.wisc.edu

 NPM Credit What You Spread

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

 SnapPlus: Starting a SnapPlus Farm and Completing the Farm Screen (<https://www.youtube.com/watch?v=fL2V16K2dvs>)

 NPM Soil Testing Basics (http://ipcm.wisc.edu/download/pubsNM/SoilTestBasix_2007.pdf)

 Basic Soil Sampling for Wisconsin Agriculture (http://www.youtube.com/watch?v=SwBZp_AXy0Y)

 UWEX Sampling Soils for Testing A2100 (<http://learningstore.uwex.edu/assets/pdfs/A2100.pdf>)

 UWEX Nutrient Management Guidelines for Field, Vegetable and Fruit Crops in Wisconsin, A2809 (<http://learningstore.uwex.edu/assets/pdfs/A2809.pdf>)

 SnapPlus: Completing the Field Screen—Part 1 (<https://www.youtube.com/watch?v=v2HFdetY-JY>)

 DATCP Choosing the Critical Soil Type (<http://datcp.wi.gov/uploads/Farms/pdf/ChoosingCriticalSoilType.pdf>)

 Nutrient Applications Restrictions maps (www.manureadvisorysystem.wi.gov)

 SnapPlus: Completing the Field Screen—Part 2 (<https://www.youtube.com/watch?v=c4bNxMWsuVQ>)

 SnapPlus: Completing the Field Screen—Part 3 (<https://www.youtube.com/watch?v=z-YhwxnA8mg>)

 NPM Know How Much You Haul (<http://ipcm.wisc.edu/download/pubsNM/KnowHowMuchYouHaul.pdf>)

 NPM Calibrating a Manure Spreader (<http://www.youtube.com/watch?v=m9LAsOgVN-g>)

 SnapPlus: Cropping Screen Basics (<https://www.youtube.com/watch?v=ChZ30d2SU8Q>)

 NPM Credit Legume Nitrogen and Reap the Profits (http://ipcm.wisc.edu/download/pubsNM/Legume_Credits_1008.pdf)

 SnapPlus: Using the Rotation Wizard Part 1 (<https://www.youtube.com/watch?v=1b3FeN4iYbA>)

 SnapPlus: Using the Rotation Wizard Part 2 (https://www.youtube.com/watch?v=0V_rxwyzaj0)

SnapPlus Glossary:

590 standard: The USDA-NRCS technical guide standard that lists the required components and considerations for a nutrient management plan that complies with local, state and federal government agricultural programs.

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 carryover P₂O₅ and K₂O banked since the last soil test.

Below field slope to water: The field slope percentage range on the route water flows from the edge of the field to perennial water (anything that holds or flows water year-round).

Concentrated flow channel: Areas within or on field edges where water flow comes together and can make small channels or gullies.

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).

DATCP: The acronym for the Wisconsin Department of Agriculture, Trade and Consumer Protection.

Distance to perennial water: The distance (ft) from the edge of the field to perennial water (anything that holds or flows water year-round). Indicated by solid blue lines or areas on restriction maps.

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 t/a/yr) 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 assume there are no concentrated flow channels through the grass filters.

Legume credits: The fertilizer value of legumes that is used to reduce nitrogen fertilizer application rates to account for the nutrients supplied by the legume.

Manure nutrient credits: The fertilizer value of applied manure.

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.

Predominant soil type: The soil that makes up the largest portion of the field. Used to determine nutrient recommendations in SnapPlus.

Rotation wizard: A tool in SnapPlus that greatly reduces the time and effort required for data entry and information maintenance by allowing you to add crop and application information, or change existing crop and application information for multiple fields and years in one operation.

Soil map symbol: On soil maps, the small letters or numbers that are within the same polygon, i.e. SmB, DpD2.

Soil loss: The general loss of soil due to erosion.

Soil series (name): A specific soil type that has distinct identifying physical properties such as texture, organic matter, erodibility and underlying parent material.

Slope class: indicated by the letter following the soil series abbreviation. For example, in the soil map symbol WoB, the soil series name Wo is followed by the slope class B. Slope classes (%) are A=0-2, B=2-6, C=6-12, D/E=>12)

Strip-cropped: When contour strips have been installed and maintained on a field. In SnapPlus, a minimum of 2 contour strips placed across the field's planning slope length (L) is required.

Tile drained: A field that has drainage tile in place under the surface to reduce the moisture content of cropland fields.

WPDES: An acronym for Wisconsin Pollutant Discharge Elimination System. WPDES-permitted farms are also known as CAFOs. Any livestock or poultry operation with 1,000 or more animal units is a concentrated animal feeding operation (CAFO) under current regulations and is required to apply for and operate under a DNR-issued water quality protection permit.