



# What is SnapPlus?

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# WHAT IS SNAPPLUS?

- SnapPlus (Soil Nutrient Application Planner)
- Helps to protect soil and water quality
- Calculates potential soil and phosphorus runoff losses on a field-by-field basis while assisting in the economic planning of manure and fertilizer applications.





# WHAT INFORMATION DOES SNAPPLUS NEED?



## Current soil tests from DATCP certified lab

- Samples need to be pulled every four years
- One sample for every five acres



## Field locations

- Identify soil type and potential application restrictions



## Animal information

- Type of animals
- How many animals
- Manure storage



## Cropping information

- Crop
- Yield Goal
- Tillage
- Applications





# CALCULATIONS WITHIN SNAPPLUS:

UNDERSTANDING THE EQUATIONS RUNNING BEHIND THE SCENES IN SNAPPLUS



## RUSLE 2

*Revised Universal Soil Loss Equation 2*

*Daily time-step version of USLE*

**Erosion ton/acre/yr = R x K x LS x C x P**

- **R= Erosivity**
- **K= Soil erodibility**
- **LS = Slope % and length**
- **C = Crop and tillage (management)**
- **P= Practices (e.g. contouring, terraces)**

# WHAT GOES INTO THE C FACTOR???

Canopy cover (*vegetation that intercepts raindrops*)

Ground cover (*reduces waterdrop impact and runoff*)

Surface roughness (*increasing infiltration, deposition, slows runoff*)

Ridge height (*ridges parallel to flow lead erosion, cross flow increase deposition*)

Soil biomass (*live and dead roots, buried residue*)

Soil consolidation (*soil becomes less erodible over time after disturbance*)

Tillage (*frequency and amount of soil disturbance*)

% Surface disturbance (*more disturbance greater chance for erosion*)





# T=TOLERABLE SOIL LOSS:

- Manage on-farm soil erosion
  - Help reduce soil loss to tolerable levels (T)
    - T=Tolerable Soil Loss
    - T levels are based on soil type
    - Range from 1-5 tons/acre/year

**Dominant critical soil details:**  
Name: Kewaunee  
Symbol: KnB Slope: 4.0  
Texture: Silt Loam

**Rotation Settings**  
Start 2021 Years 5

**Contouring**  
 None  
 On contour  
 Strip crop

**Filter Area**  
 None  
 Designed, field edge  
 Designed, in field

**Summary 2021 to 2025**  
Avg soil loss **4.1** t/ac/yr  
Field "T" 3 t/ac/yr  
Avg P Index 4 SCI 0.2

	P205	K20	
Removal	305	305	lb/ac
Balance	-177	-56	lb/ac

Soil test P is 50 or less so no P205 balance target is needed.



# WHAT CAN WE DO TO MEET T???

## Alter Crop Rotations

Increase years of perennial crops

Increase years with cover crops

Reduce years of biomass/residue removal

Improve crop/residue production

## Change Tillage Practices

Eliminate tillage

Reduce intensity of tillage practices

Eliminate fall tillage where no manure

Reduce total number of passes

## Use Conservation Practices

Strip Cropping

Contour Farming

Vegetative strips/buffers

Hard Practices





# PHOSPHORUS (P) INDEX

- Estimate the average amount of phosphorus delivered to surface water through runoff and erosion (lbs/A/yr)

**Dominant critical soil details:**  
Name: Kewaunee  
Symbol: KnB Slope: 4.0  
Texture: Silt Loam

**Rotation Settings**  
Start 2021 Years 5

**Contouring** **Filter Area**  
 None  None  
 On contour  Designed, field edge  
 Strip crop  Designed, in field

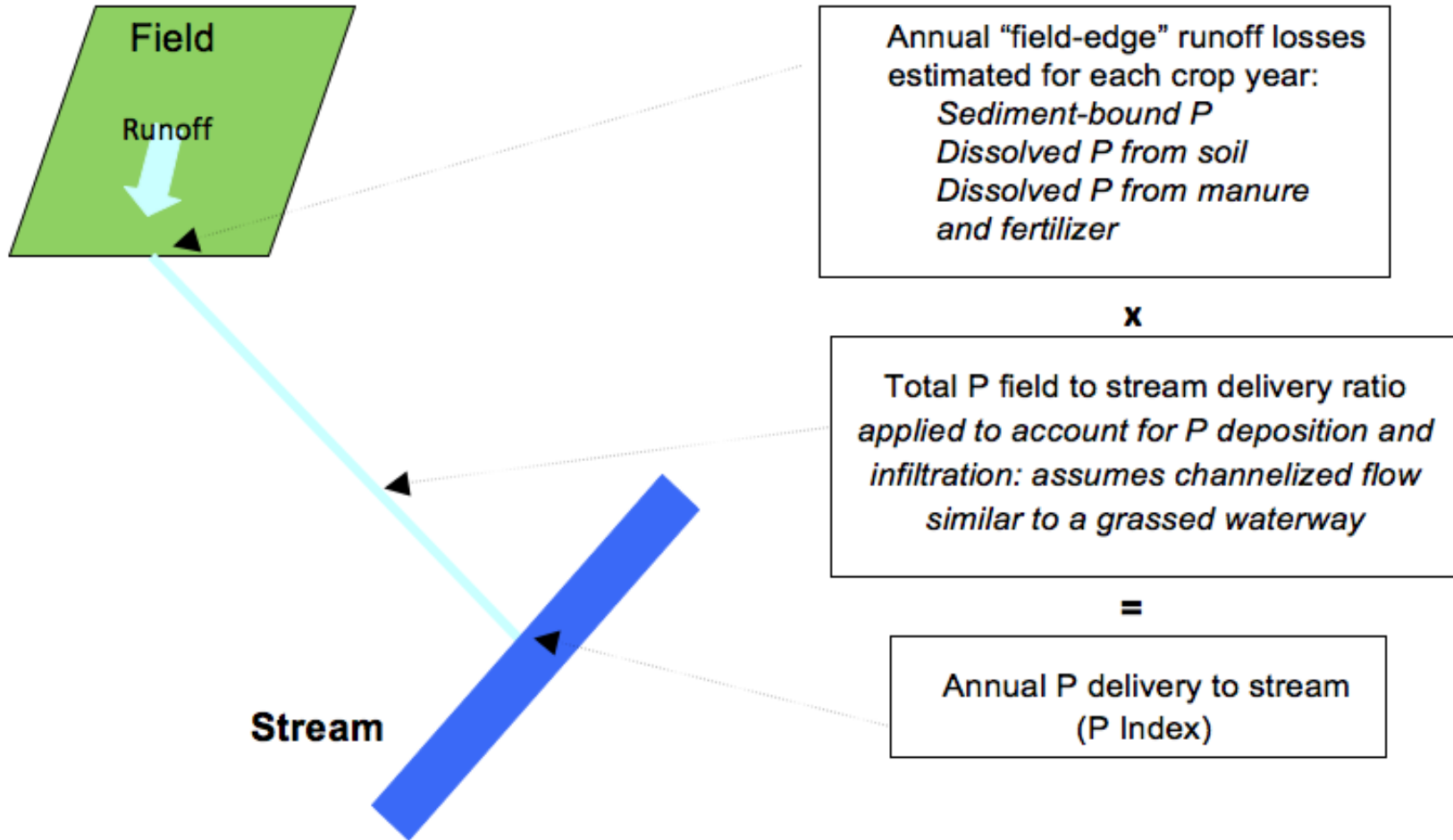
**Summary 2021 to 2025**  
Avg soil loss 4.1 t/ac/yr  
Field 1 3 t/ac/yr  
Avg P Index 4 SCL 0.2

	P205	K20	
Removal	305	305	lb/ac
Balance	-177	-56	lb/ac

Soil test P is 50 or less so no P205 balance target is needed.



# WISCONSIN P INDEX



# P205 BALANCE

**Dominant critical soil details:**  
 Name: Mchenry  
 Symbol: MdC2 Slope: 9.0  
 Texture: Silt Loam

**Rotation Settings**

Start  Years

Contouring  None  On contour  Strip crop

Filter Area  None  Designed, field edge  Designed, in field

**Summary 2023 to 2026**

Avg soil loss	2.4	t/ac/yr
Field "T"	5	t/ac/yr
Avg P Index	2	SCI 0.1

	P205	K2O	
Removal	160	480	lb/ac
Balance	-140	-410	lb/ac

Soil test P is 50 or less so no P205 balance target is needed.

**Rotation Settings**

Start  Years

Contouring  None  On contour  Strip crop

Filter Area  None  Designed, field edge  Designed, in field

**Summary 2023 to 2026**

Avg soil loss	3.4	t/ac/yr
Field "T"	5	t/ac/yr
Avg P Index	3	SCI -0.2

	P205	K2O	
Removal	160	480	lb/ac
Balance	-140	-400	lb/ac

Soil test P is greater than 100 ppm so P205 balance should be less than -40 lb / acre.

- P205 removal shows the expected crop removal across the rotation
- P205 Balance represents the difference between the total application and the crop removal over the rotation
- Positive balance indicates that soil P concentrations are likely rising
- Negative balance indicates that soil P concentrations may be going down over the rotation



# WHAT CAN WE DO TO ACHIEVE A GOOD PI???

## P Applications

- Minimize surface applications
- Do not apply nutrients to frozen soils

## Optimum Soil P Levels

- Nutrient applications should not exceed soil test recommendations to prevent building soil P.
- Removal of crop biomass can reduce soil test P levels over time

Alter Crop Rotations

Reduce Tillage Practices

Using Conservation Practices



# SOIL CONDITIONING INDEX (SCI)

- SCI predicts the impact of a cropping system on surface soil organic matter (SOM)
- What impacts SCI?
  - Organic matter going back into the soil
  - Effect of field operations on organic matter breakdown (this is where the STIR comes in)
  - Erosion

**Rotation Settings**

Start  Years

**Contouring**  
 None  
 On contour  
 Strip crop

**Filter Area**  
 None  
 Designed, field edge  
 Designed, in field

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**Summary 2022 to 2024**

Avg soil loss	<input type="text" value="1.6"/>	t/ac/yr
Field "T"	<input type="text" value="5"/>	t/ac/yr
Avg P Index	<input type="text" value="1"/>	<b>SCI</b> <input type="text" value="0.3"/>

	P205	K20	
Removal	<input type="text" value="150"/>	<input type="text" value="190"/>	lb/ac
Balance	<input type="text" value="-110"/>	<input type="text" value="-7"/>	lb/ac

Soil test P is 50 or less so no P205 balance target is needed.

# HOW DO WE IMPROVE OUR SCI???

## Organic Additions

- Manures
- Composts
- Organic byproducts

Alter Crop Rotations

Reduce Tillage Practices

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