

# The Next Generation Nutrient Management Planning Software in OMAFRA's AgriSuite

Presenter:

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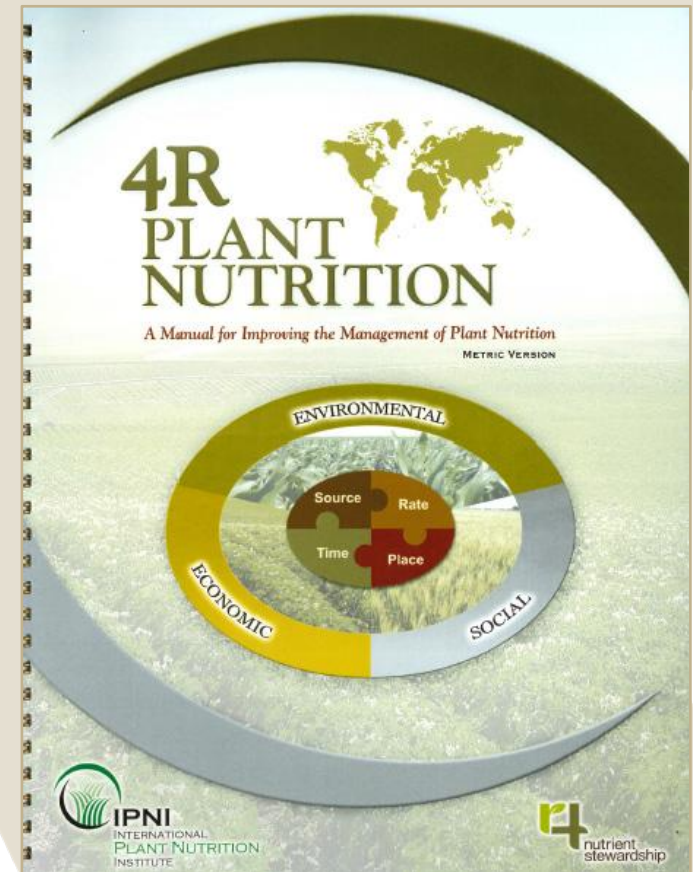
2019 Latornell Conservation  
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# What is Nutrient Management Planning?

**Nutrient Management Planning** is a tool that farmers can use to increase the efficiency of all the nutrient sources available to their operation and needed for crop production, while reducing production and environmental risk, ultimately increasing profit.

The **4R Nutrient Stewardship** program has nutrient management planning at its core.



# History of Nutrient Management Planning Tools in Ontario

- Agricultural “Code of Practice” (1970s)
- MSTOR: **M**anure **S**torage Sizing software (early 1990’s)
- NMAN: **N**utrient **M**anagement Planning software
  - Began as a spreadsheet late 1980’s. Visual Basic Program in early 1990’s
- NMAN97: Combined MSTOR and NMAN in one package
- Nutrient Management Act/Regulations (2002/2003)
  - NMAN became the default tool for preparing NMS/NMPs
  - Acquired a reputation of being a “regulatory” tool
- AgriSuite: Package of Ag-Related Tools (MSTOR, NMAN, MDS)
  - First attempt to broaden use beyond regulatory nutrient management planning
- 4R Nutrient Stewardship Program – Industry led
- Next Generation AgriSuite: Modular, Cloud-Based, Mobile

# Accessing the AgriSuite Software

To access, simply “GOOGLE” **OMAFRA AgriSuite**

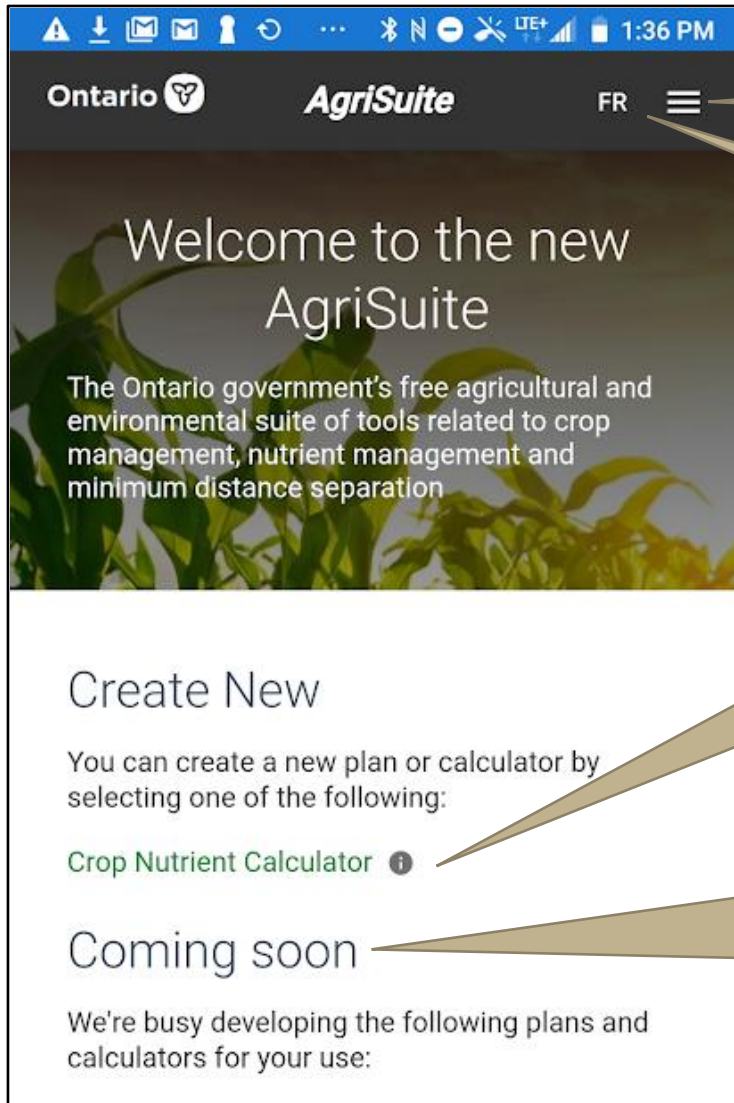
Or <http://www.omafra.gov.on.ca/english/nm/nman/agrisuite.htm>

Or “Hey Google, Find OMAFRA’s new nutrient management software”

The screenshot shows a notification window titled "We're rebuilding AgriSuite!". The main heading is "We're rebuilding AgriSuite!". Below it, the text reads: "Find out what's happening and explore new tools as they're developed. We'd like to hear from you." There are two green buttons: "Continue to the new AgriSuite" and "Continue to the current AgriSuite". Below the buttons, it says "The current AgriSuite is still ACTIVE." Callouts explain that the top button leads to the new version (mobile or desktop) and the bottom button leads to the current released version.

# Introducing: The New AgriSuite

A walk through the mobile version



“Hamburger” opens up main menu. Sign In, Create Account, Contact Us, Provide Feedback

Select language of preference

List of available AgriSuite calculation tools. Clicking on “i” gives more detailed information on the various calculators

Plans and calculators coming soon include:

- Organic Amendment Calculator
- Phosphorus Loss (PLATO) calculator
- Field Management Plan
- Manure Storage Sizing
- Nutrient Management Strategy and Plan
- MDS I and MDS II

# The New AgriSuite

## A view of the Desktop Version

The screenshot displays the AgriSuite desktop interface. At the top, there is a dark navigation bar with the Ontario logo on the left, the 'AgriSuite' title in the center, and 'FR' with a menu icon on the right. The main content area is divided into three columns. The left column features a large image of green leaves with the text 'Welcome to the new AgriSuite' and a sub-headline: 'The Ontario government's free agricultural and environmental suite of tools related to crop management, nutrient management and minimum distance separation'. The middle column is titled 'Create New' and lists three options: 'Crop Nutrient Calculator', 'Organic Amendment Calculator', and 'Fertilizer Calculator'. Below this is a 'Coming soon' section with the text 'We're busy developing the following plans and calculators for your use:' followed by 'Phosphorus Loss (PLATO) Calculator', 'Field Management Plan', and 'Other future plans and calculators'. The right column is titled 'Sign in to save and access your work' and includes a 'Sign in' button, a link for 'Forgot your password?', and a 'Create account' button. Below the sign-in section, it lists benefits of creating an account, such as 'securely and privately save your work online' and 'access from any internet connected device'. At the bottom of the page, there is a footer with navigation links for 'about Ontario', 'accessibility', 'news', 'privacy', and 'terms of use', a 'Provide feedback' button, and logos for the 'CANADIAN AGRICULTURAL PARTNERSHIP', 'Ontario', and 'Canada'. The version number 'V0.1.51 2019-11-15' is also present in the bottom right corner.

With more “real estate” on screen, a series of screens can be displayed or alternatively there is less need to “scroll” down. The “look” however is consistent.

# Sign In Option (Mobile or Desktop)

The screenshot shows the AgriSuite mobile app interface. At the top, there is a status bar with various icons and the time 2:25 PM. Below that is a dark header with the Ontario logo, the AgriSuite logo, and the text 'FR' and a menu icon. A green banner below the header contains the text 'Get the most from AgriSuite' and a 'Sign in' button. A red circle highlights the 'Sign in' button and the text 'Get the most from AgriSuite'. To the right of the 'Sign in' button is a white 'X' icon. Below the banner, there is a section for 'Crop Nutrient 1' with a pencil icon and the text 'Impe'. Underneath are three tabs: 'Field Information', 'Crop Information', and 'Report'. The 'Field Information' tab is selected. Below the tabs are four input fields: 'Farm Name' with the value 'Farm A', 'Field Name' with the value 'Field 1', 'Field Area' with the value '65' and the unit 'ac', and 'Upper Tier Municipality' with the value 'City of Ottawa' and a dropdown arrow.

Clicking on "X" removes Sign in request

**Sign in Option:** Can still use calculator if don't sign in, BUT cannot save results.

Signing in allows user to:

- Save calculations
- Sign in from desktop or mobile device to access same files

Will need to:

- provide email address
- Remember password

# Crop Nutrient Calculator (Field Information)

Ontario AgriSuite FR

Get the most from AgriSuite Sign in

Crop Nutrient 1 Imperial

Field Information Crop Information Report

Farm Name  
Farm A

Field Name  
Field 1

Field Area  
65 ac

Upper Tier Municipality  
City of Ottawa

You can edit the default name of your Crop Nutrient Calculation

Choose the System of Units you want to work in

The **Solid Line** indicates which worksheet is displayed:

- Field Information
- Crop Information
- Report

Enter field information here such as name, location, acreage, soil test results. "Scroll Down" to reveal all required data entries.

# Crop Nutrient Calculator (Field Information)

Ontario AgriSuite FR

🏠 Crop Nutrient 1 Imperial ▾

Field Information Crop Information Report

Crop Type  
Corn ▾

Crop Sub-type  
grain ▾

Yield bu/ac

(@ 15.5% moisture) (: bu/ac)

Previous crop N credit  
No nitrogen credit ▾

The **Solid Line** indicates you are now on the Crop Information Input screen

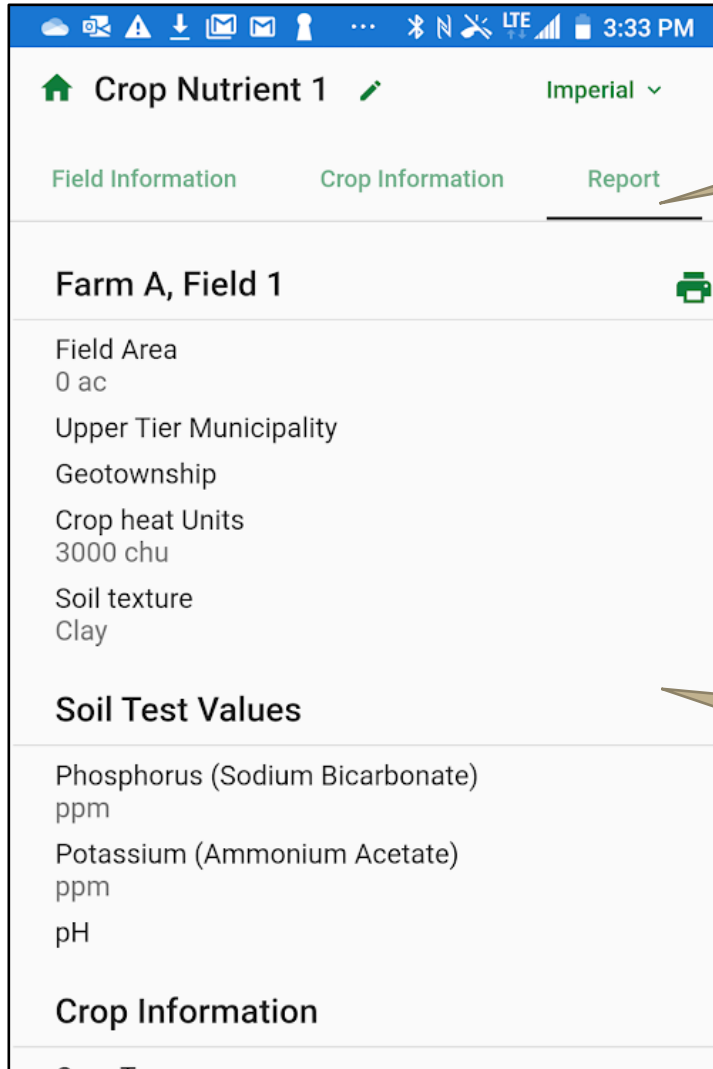
Click on the “drop down” arrow to reveal a full list of potential crops. Select the crop of interest.

Click on the “drop down” arrow to select crop subtype (eg. grain, silage, sweet)

Enter anticipated yield goal

Drop down will list conditions that may give a nitrogen “credit” to this year’s crop

# Crop Nutrient Calculator (Report Summary)



The **Solid Line** indicates now on the Report Screen.

Clicking on the Printer icon allows you to send the report directly to a printer

Field, crop, and nutrient recommendation information is summarized. Scroll down the screen to reveal all data.

# Practice Exercise (Input screen)

A grower in Innisfil Township of Simcoe County, wants to determine the amount of N-P-K fertilizer he needs to apply to achieve his historical grain corn yield average of 140 bu/ac. The grower generally ploughs the field in the fall.

Field area: 50 ac

Soil type: Clay loam

Previous crop: Soybeans

Soil test results for field: P 15      K 85      pH 7.4

Manure has never been applied to this field.

The grower generally applies his nitrogen “preplant”

Q1. How much N-P-K does he need?

Q2. How much more (or less) N would the grower need if applied the N at side-dress time?

# Practice Exercise (Report Summary Screen – Desktop)

Ontario 
AgriSuite FR

[Home](#) **Crop Nutrient 1** Imperial

Field Information   Crop Information   Report

**Example, Field**

Field Area 50 ac	Upper Tier Municipality County of Simcoe	Geotownship INNISFIL	Crop heat Units 2929 chu	Soil texture Clay Loam
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**Soil Test Values**

Phosphorus (Sodium Bicarbonate) 15 ppm	Potassium (Ammonium Acetate) 85 ppm	pH 7.4
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**Crop Information**

Crop Type Corn	Crop Sub-type grain	
Yield 140 bu/ac (@ 15.5% moisture) (Geotownship Average: 137.0 bu/ac)	Previous crop N credit Soybeans (27 lb/ac)	<input type="checkbox"/> Tillage method is no-till
N fertilizer timing Preplant	<input type="checkbox"/> Manure or NASM supplies nitrogen for this crop	

**Summary**

Production recommendation (lb/ac)	Nitrogen (N)	113
	Phosphate (P <sub>2</sub> O <sub>5</sub> )	18
	Potash (K <sub>2</sub> O)	45
Nutrient removal (lb/ac)	Nitrogen (N)	116
	Phosphate (P <sub>2</sub> O <sub>5</sub> )	59
	Potash (K <sub>2</sub> O)	40

**Notes**

# Practice Exercise (N Application Timing Comparison)

## Pre-Plant

Summary		
Production recommendation (lb/ac)	Nitrogen (N)	113
	Phosphate (P <sub>2</sub> O <sub>5</sub> )	18
	Potash (K <sub>2</sub> O)	45
Nutrient removal (lb/ac)	Nitrogen (N)	116
	Phosphate (P <sub>2</sub> O <sub>5</sub> )	59
	Potash (K <sub>2</sub> O)	40

## Side Dress

Summary		
Production recommendation (lb/ac)	Nitrogen (N)	91
	Phosphate (P <sub>2</sub> O <sub>5</sub> )	18
	Potash (K <sub>2</sub> O)	45
Nutrient removal (lb/ac)	Nitrogen (N)	116
	Phosphate (P <sub>2</sub> O <sub>5</sub> )	59
	Potash (K <sub>2</sub> O)	40

$$113 - 91 = 22 \text{ lbs N/ac}$$

# A Look at Future Calculators

**AgriSuite**

## Create New

You can create a new plan or calculator by selecting one of the following:

- Crop Nutrient Calculator ⓘ
- Organic Amendment Calculator ⓘ
- Fertilizer Calculator ⓘ

## Coming soon

We're busy developing the following plans and calculators for your use:

- Phosphorus Loss (PLATO) Calculator ⓘ
- Field Management Plan ⓘ
- Other future plans and calculators ⓘ

Determines the amount of N-P-K and micronutrients you can expect from manures and biosolids applied

Allows one to “blend” fertilizer sources to achieve the target fertilization rates

Calculators can work independent of each other but can also be used as a package to develop a full nutrient management plan

# Organic Amendment Calculator

## Desktop View


Same general layout and navigation.  
Reduces need to double enter info.

### Field Information

The screenshot shows the AgriSuite web application interface. At the top left is the Ontario logo, and at the top right is the AgriSuite logo. Below the header, there is a breadcrumb trail: Home > Organic Amendment 1 > Edit. A navigation bar contains four tabs: Field Information (selected), Material Type, Material Application, and Report. The main content area is divided into three input fields: Farm Name (containing 'Farm A'), Field Name (containing 'Field 1'), and Field Area. Below these fields is a large text area labeled 'Notes'.

# Organic Amendment Calculator

## Material Type

Organic Amendment 1 

Field Information   **Material Type**   Material Application   Report

Material name: Material A   Form: Liquid   Type: Swine

Notes

Nutrient values

Source: Nutrient Lab Analysis   Wet/Dry Basis: Wet Basis   Dry Matter Range: Average (0-18%)

[Add Nutrient Value](#)

Dry Matter (DM) %  
Databank: 3.6 % (2201 samples)

Nitrogen (Total Kjeldhal Nitrogen) %  
Databank: 0.39 % (2201 samples)

Ammonia + Ammonium Nitrogen ppm  
Databank: 2,646 ppm (2201 samples)

Phosphorus (P) %  
Databank: 0.12 % (2183 samples)

Potassium (K) %


# Organic Amendment Calculator

## Material Application

🏠 Organic Amendment 1 ✓ Imperial ▾

Field Information   Material Type   **Material Application**   Report

Application name  
Material App A

Application date  
5/1/2020 

Application method  
Tanker ▾

Application timing  
Preplant ▾

Application rate  
gal/ac

Season  
Spring ▾

Incorporation details  
Incorporated 1 day ▾

Cover crop exists

**Summary**

Retained Ammonium-N	75%
Available Organic-N	0%
Available Nitrate-N	95%

**Available Nutrients**

Nitrogen (N)	0 lb/1000gal
Phosphate (P <sub>2</sub> O <sub>5</sub> ) (this year)	0 lb/1000gal
Phosphate (P <sub>2</sub> O <sub>5</sub> ) (long term)	0 lb/1000gal
Potash (K <sub>2</sub> O)	0 lb/1000gal

**Nitrogen Loss (N-Index)**

0 lb/ac (10%)

**Nutrients applied**

Nitrogen (N)	NaN lb/ac
Phosphate (P <sub>2</sub> O <sub>5</sub> )	NaN lb/ac
Potash (K <sub>2</sub> O)	NaN lb/ac

**Estimated economic value**

0 \$/ac 📌

**Trace elements applied**

# Fertilizer Blend Calculator

## Fertilizer Application

🏠 Fertilizer 1 ↗ Imperial ▼

Field Information Fertilizer Application

Application name: Fertilizer App A      Application date: 5/1/2020 📅

Calculate Nutrients Applied  
 Calculate Fertilizer Blend & Application Rates

### Products

Add Product

Product 1 ^

Fertilizer type: Dry      Fertilizer product: 46-0-0

Application rate:   lb/ac

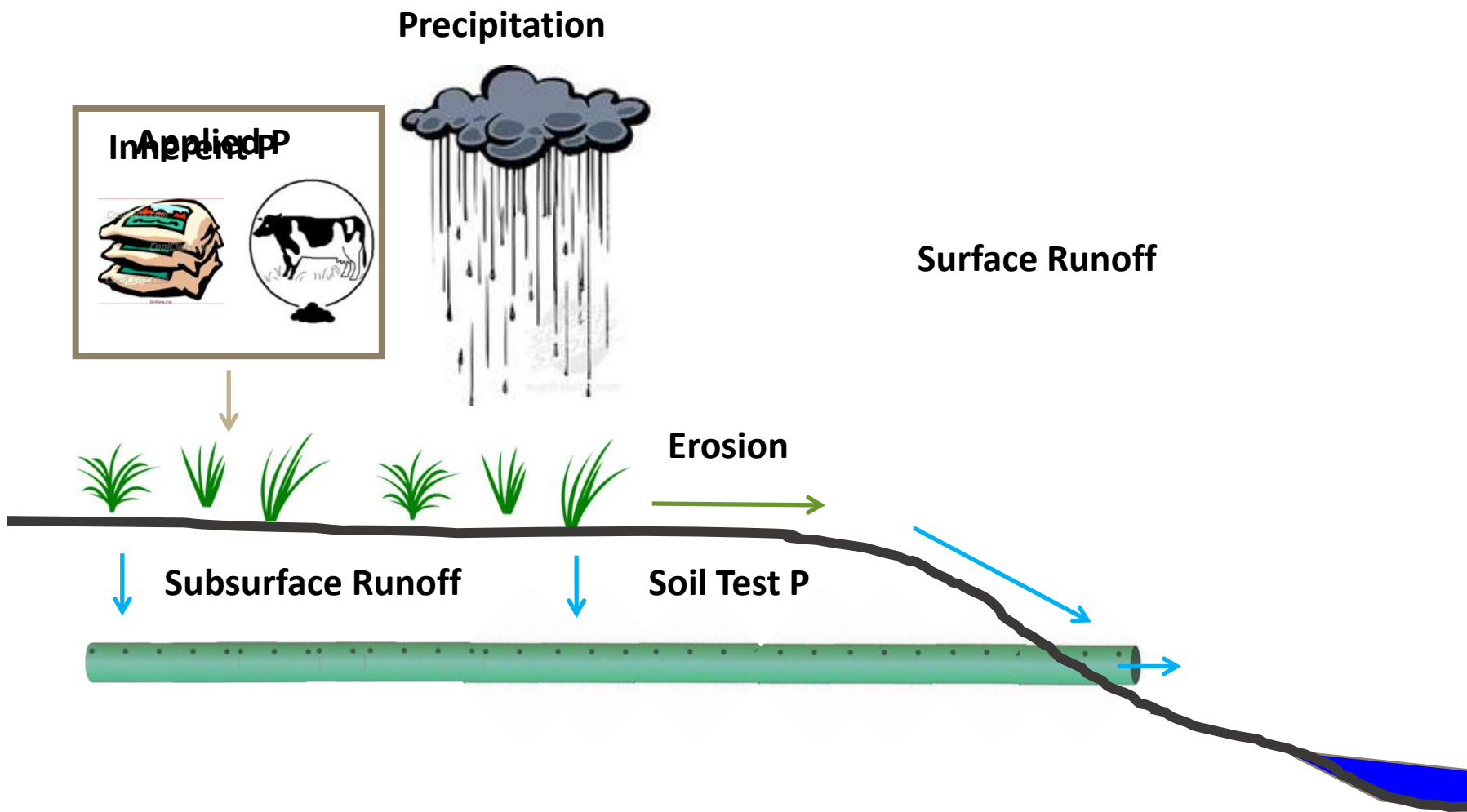
<b>Nitrogen (N)</b> 0 lb/ac	<b>Phosphate (P<sub>2</sub>O<sub>5</sub>)</b> 0 lb/ac	<b>Potash (K<sub>2</sub>O)</b> 0 lb/ac
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### Summary

**Total nutrients applied**

Nitrogen (N)	0 lb/ac
Phosphate (P <sub>2</sub> O <sub>5</sub> )	0 lb/ac
Potash (K <sub>2</sub> O)	0 lb/ac

# Phosphorus Loss (PLATO) Calculator



# PLATO Calculator – Inputs

## Soil:

- Type (texture, HSG etc)
- Phosphorus Soil test Value
- Tile Drainage System Design
- Annual average erosion rate

## Crop Grown

## Fertilizer and/or Manure:

- Type
- Method of Application
- Timing of Application
- Rate of Application

Much of this  
required  
information is  
entered when using  
other calculators

# PLATO Calculator – Example Scenarios

Site Characteristic	Lower Thames	Upper Thames
Soil Type	Brookston Clay Loam (Flat) 1 T/ha/yr annual soil Loss	Guelph Loam (3%) 9.2 T/ha/yr annual soil loss
Tile Drained	Yes	Yes
Crop/Tillage	Worked in fall ahead of corn	Worked in fall ahead of corn
Fertilizer P Form	Liquid Hog Manure (5000 lgal/ac)	Liquid Hog Manure (5000 lgal/ac)
Soil Test Phosphorus value	a. 15 b. 50	a. 15 b. 50
How Applied	a. Surface (not incorporated) b. Incorporated within 48 hrs	a. Surface (not incorporated) b. Incorporated within 48 hrs
When Applied	a. August (after wheat) b. October (after soybeans) c. January (frozen field)	a. August (after wheat) b. October (after soybeans) c. January (frozen field)

# PLATO Calculator – Example Scenarios

<b>Hog manure (5000 lgal/ac)</b> <b>Field worked ahead of corn</b>			PLATO					
			Brookston Clay Loam (Flat) (1 T/ha/yr)			Guelph Loam (3%) (9.2 T/ha/yr)		
			Soil Test P	How Applied	When Applied	Inherent	Applied	Total
15	Surface	August	18	32	50	80	5	85
15	Surface	October	18	107	125	80	33	113
15	Surface	January	18	330	348	80	287	366
15	Incorp. 48 hrs	August	18	6	24	80	1	81
15	Incorp 48 hrs	October	18	20	38	80	6	86
50	Surface	August	39	32	71	89	5	94
50	Surface	October	39	107	146	89	33	123
50	Surface	January	39	330	369	89	287	376
50	Incorp. 48 hrs	August	39	6	45	89	1	90
50	Incorp. 48 hrs	October	39	20	59	89	6	95
50 (no tile)	Incorp. 48 hrs	October	44	20	64	126	4	130
50 (no tile)	Surface	October	44	105	149	126	21	147

# Online Soil Erosion Estimator

Coming soon to AgMaps

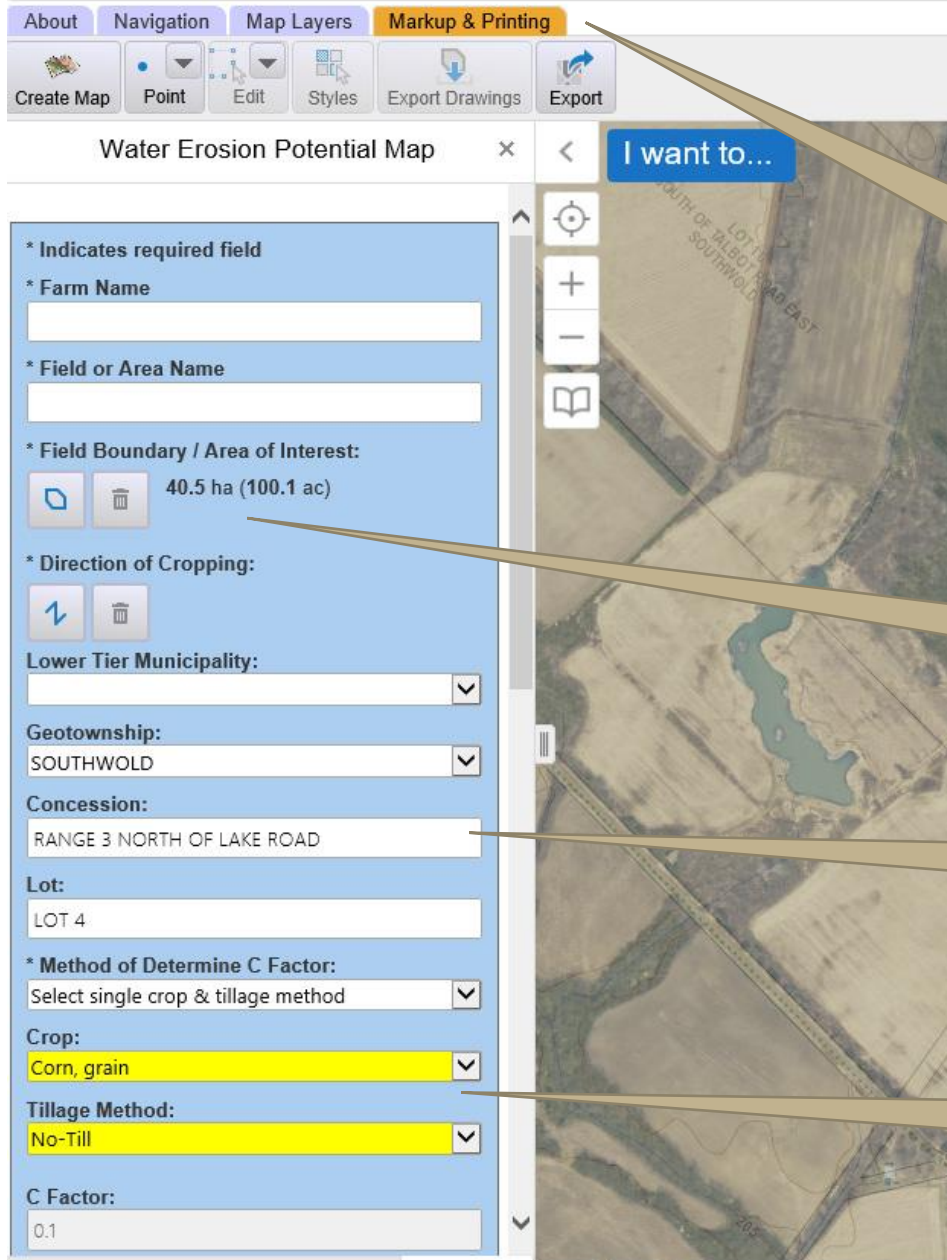


<https://www.gisapplication.lrc.gov.on.ca/AIA/index.html?viewer=AIA.AIA&locale=en-US>

Long-Term Objective is to also incorporate mapping functionality within AgriSuite

<https://intra.dev.gisapplication.lrc.gov.on.ca/Html5Viewer261/index.html?viewer=AIA.AIA&locale=en-US>.

# Soil Erosion Estimator in AgMaps



The screenshot shows the AgMaps interface with the 'Markup & Printing' tab selected. The map displays an aerial view of a farm field with a polygon outlining a specific area. The form on the left contains the following fields:

- \* Indicates required field**
- \* Farm Name** (text input)
- \* Field or Area Name** (text input)
- \* Field Boundary / Area of Interest:** Includes a polygon tool icon and a trash icon. The value is 40.5 ha (100.1 ac).
- \* Direction of Cropping:** Includes a direction tool icon and a trash icon.
- Lower Tier Municipality:** (dropdown menu)
- Geotownship:** SOUTHWOLD (dropdown menu)
- Concession:** RANGE 3 NORTH OF LAKE ROAD (text input)
- Lot:** LOT 4 (text input)
- \* Method of Determine C Factor:** Select single crop & tillage method (dropdown menu)
- Crop:** Corn, grain (dropdown menu)
- Tillage Method:** No-Till (dropdown menu)
- C Factor:** 0.1 (text input)

Located in Markup and Printing Tab

Use Polygon function and air photo layer to outline farm field of interest

AgMaps populates location once field is delineated

User describes planned or usual cropping and tillage practices used on field

# Soil Erosion Estimator in AgMaps



Dark area and centroid dot shows delineated field area of interest.

# Soil Erosion Estimator in AgMaps

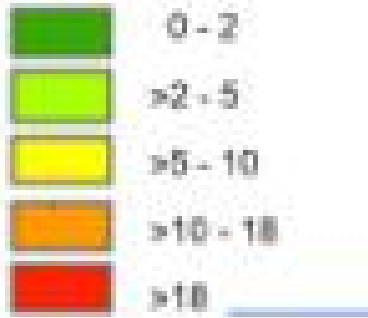


Map can be prepared showing inherent erosion risk across the field

## Inherent Water Erosion Risk Potential



## Annual Average Water Erosion Estimate (T/ha/yr)



Maps can be prepared comparing the erosion rates of different management options

# Soil Erosion Estimator in AgMaps



Grain Corn – Fall Ploughed



Grain Corn – No-Till

# The Next Generation Nutrient Management Planning Software in OMAFRA's AgriSuite

## Questions?

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