

# COHA Project 3: Impact of Soil Health BMPs on Soil and Water Management in Ornamental Nurseries

**Research Update: March 31, 2026**

# Project highlights to consider...

- Project objectives and scope
- Progress to date
- Preliminary results
- Key challenges or risks
- Expected timelines and next milestones
- Relevance and implications for growers and industry

# Why Soil Health in Field Nurseries?



# What about Container Nurseries?



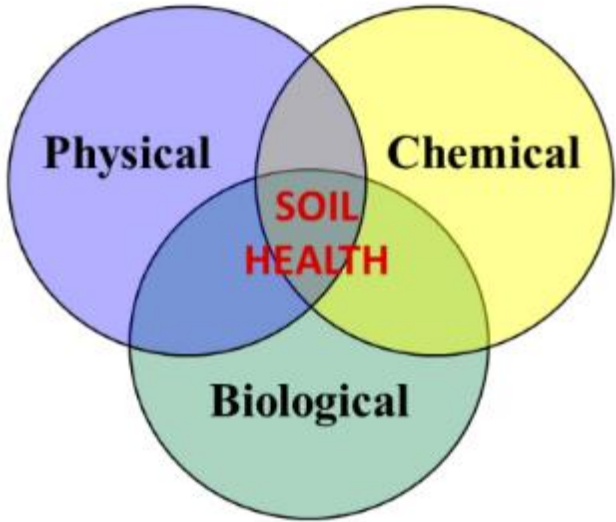
# Project Objectives

1. Evaluate **the impact of implementing the BMP strategies** at the farm level (ON, BC, AB) and at a research plot (QC) **on soil health measurements** (laboratory and in-field measurements) **and crop production** (quality, weed and pest control)
2. Evaluate impacts of soil health BMPs **on erosion, runoff and tile flows and water quality** (ON, QC)
3. Evaluate the **impact of edge-of-field treatment systems (hybrid swales) to remove nutrients from runoff/tile water** as a multi-barrier approach to maintaining surface water quality (ON)
4. Collect information on current practices in nursery field production **across Canada**; develop **feasible BMP strategies** to test **for improving soil health and water quality.**

# Project focus for improving soil and water

Best Management Practice (BMP)	Soil	Water	GHG / Carbon Sequestration
Cover Crops *	✓	✓	✓
Tillage Reduction *	✓	✓	✓
Soil Amendments *	✓	✓	✓
Hybrid Treatment Swales *	✓	✓	✓
Fertilizer Modifications	✓	✓	✓

# Soil Health Monitoring



# Crop health monitoring

- Visual observation
- Grower assessment (yield, marketability, growth rate)
- Pest & weed management (grower information)
- Irrigation/water requirements (grower information)
- Cover crop assessments (feasibility, growth and yield)



# Erosion and runoff water quantity and quality

## Ontario

## Quebec



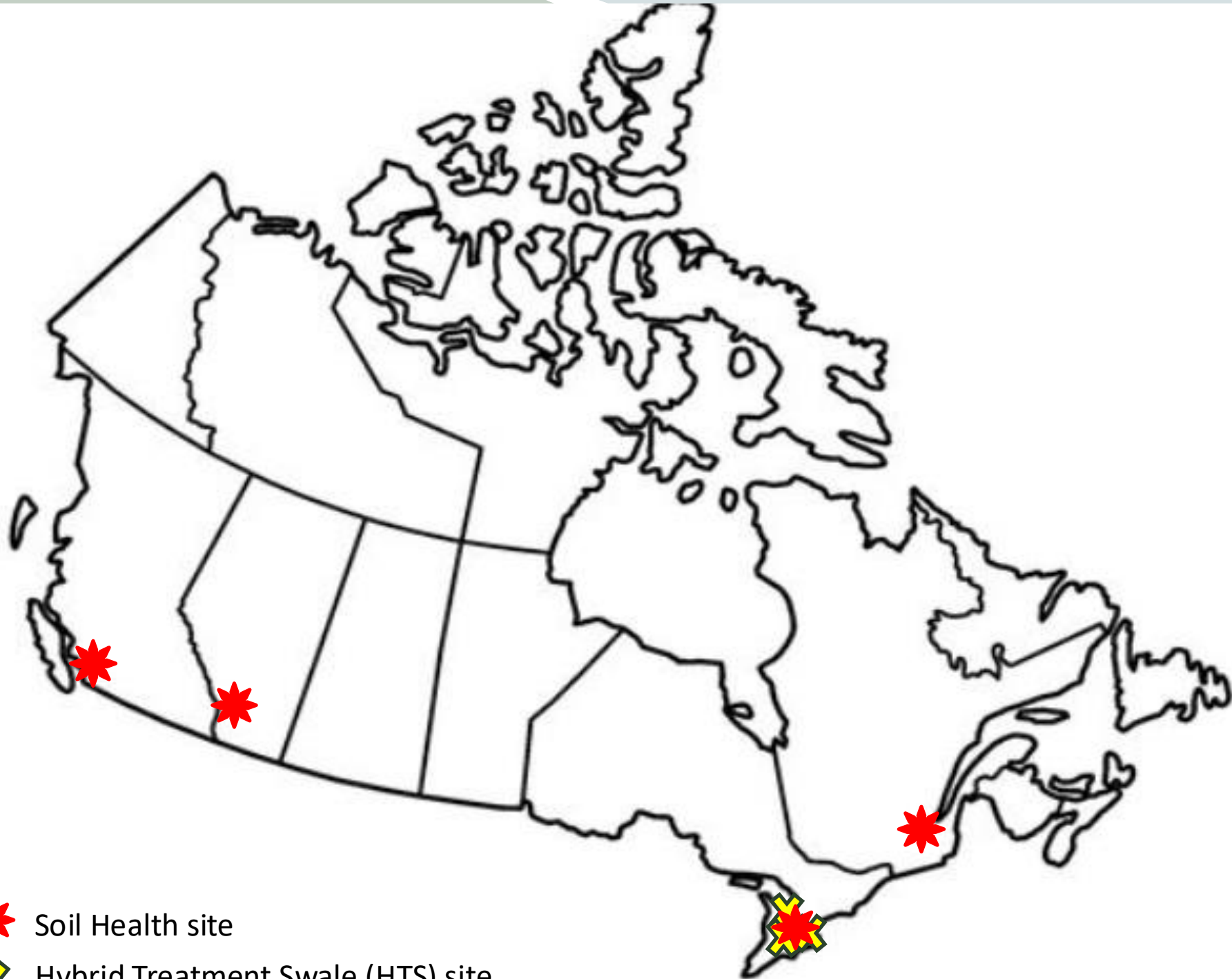
# Edge-of-field water quality: Hybrid treatment swales (HTS)



# Hybrid Treatment Swales

- Combinations as required of:
  - Woodchip denitrification bioreactor (for N removal)
  - Slag or iron /gravel mixes (for P removal)
  - Other?
  - Gravel (for water polishing)





 Soil Health site

 Hybrid Treatment Swale (HTS) site

# Ontario Nursery Site 1



Nursery field tree operation

# 2024

Cover Crops

Dropped pin  
Dropped pin  
Dropped pin

4

CC + OA  
(compost)

Dropped pin  
Dropped  
ropped pin

3

Control  
(bare)

Dropped pin  
Dropped pin  
ropped pin

2

1

Google Maps

## COMPARING:

- Cover Crops
- Cover crops + Compost
- Bare soil (shallow tillage for weed control)

## IMPACT on

- Soil Health
- Crop Health
- Erosion
- Tile Water Quality

## PLUS

- Hybrid Treatment Swale



HTS



Tile outlet

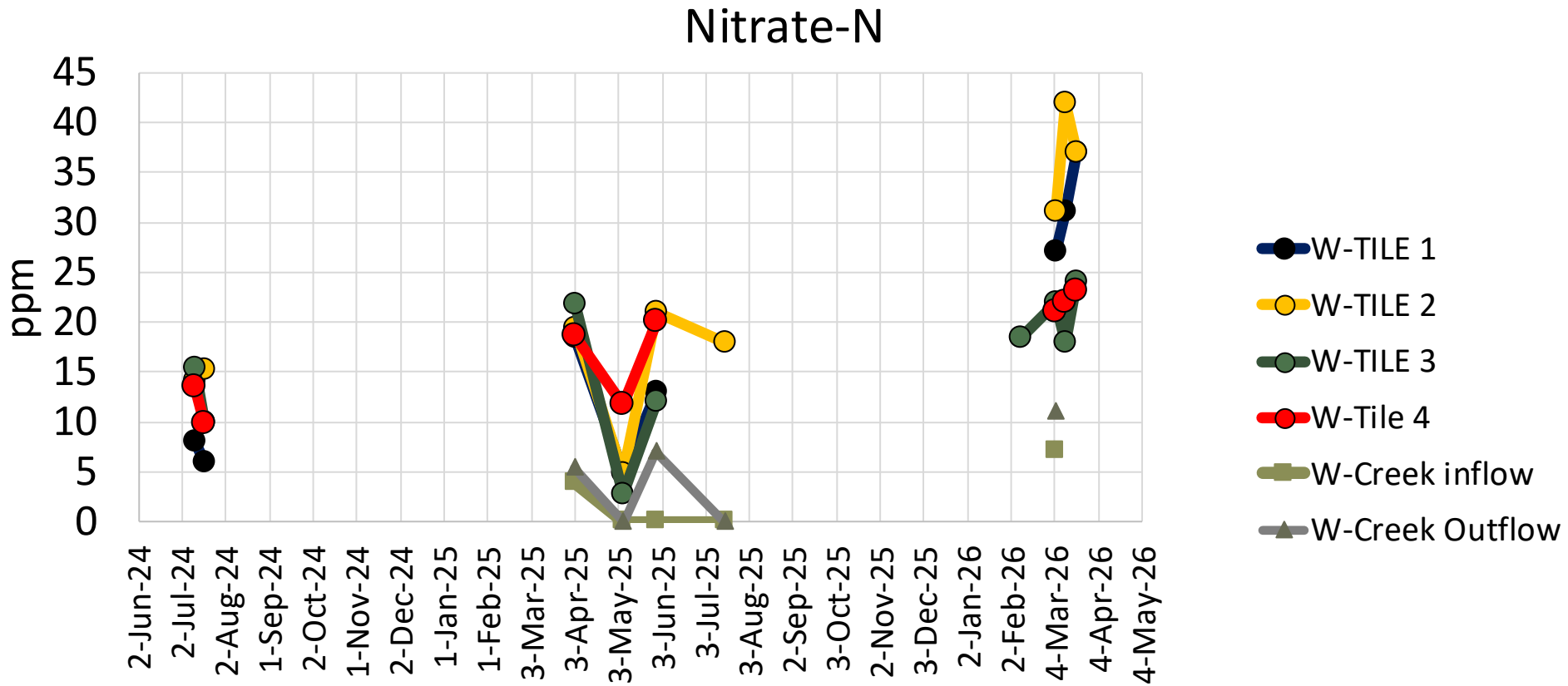


Benchmark position

# Erosion and runoff water quantity and quality



# Tile outflow data: Nitrate-N



ISCO autosamplers

# Edge of field runoff: HTS ON Site 1



2026:  
HTSwale

# Quebec Research Site



16 individual plots; CC mixes vs Control (bare) plots

# Quebec Research Site (Guillaume Gregoire, Laval)



Graded with surface and infiltrated water capture options

# September 2025



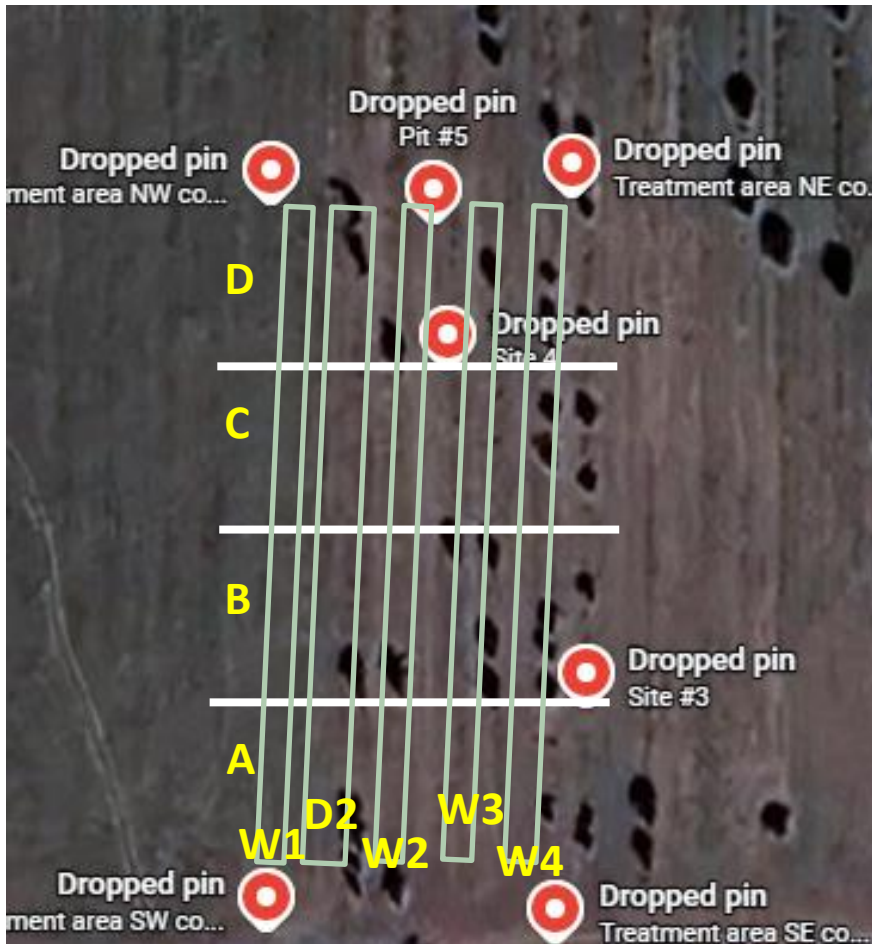
# Alberta Site

September 2025



Field Nursery operation

# Alberta plots



Sept 16, 2025

- Pedology (fine sand)
- Plot layout and Benchmark locations
- Soil chemistry and soil health sampling
- Planting schedule May 2026

Treatments:

- W1: CC
- D2: Standard (fescue&rye)
- W2: tilled/bare control
- W3: OA
- W4: CC+OA

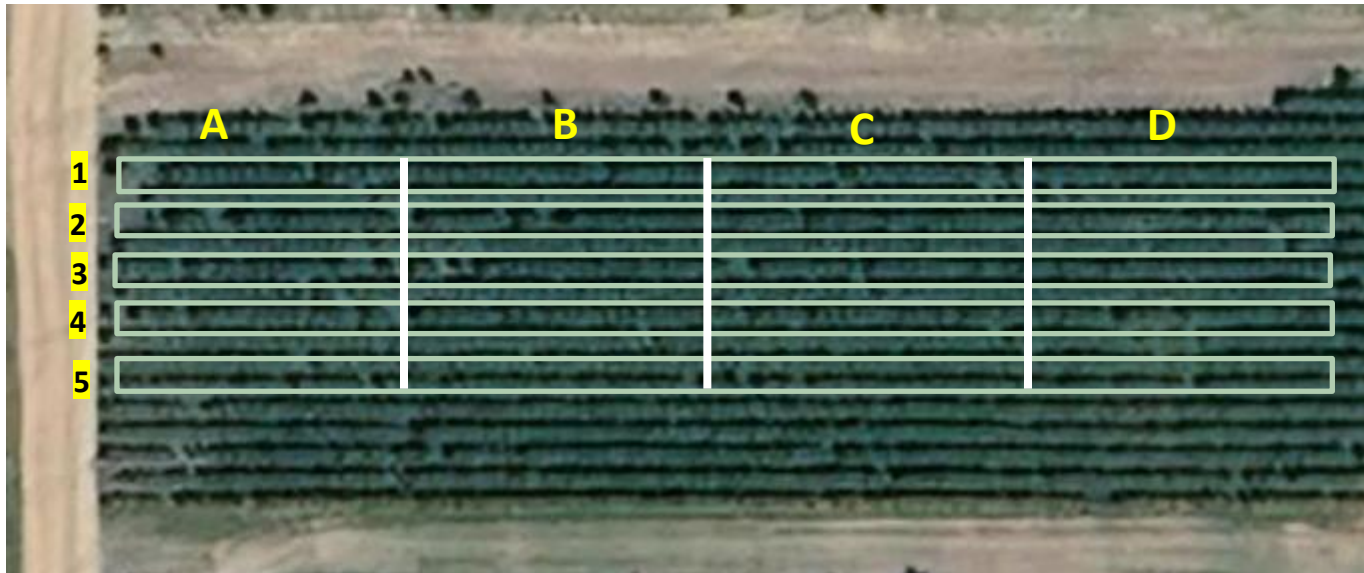
# BC Research Site

September 2025



Nursery field tree operation

# BC Plots



1. Standard
2. CC
3. OA
4. CC+OA
5. Tillage

Sept 16, 2025

- Pedology
- Plot layout and benchmark locations
- Soil Chemistry & Soil Health Sampling

# Edge-of-Field Hybrid Treatment Swales



- ON Site 1 - Nursery tree operation
- ON Site 2 – Container nursery
- ON Site 3 – Propagation greenhouse

# Ontario Site 1: Hybrid treatment swale as multi-barrier approach to managing water quality



- Edge of field treatment
- Construct a hybrid swale to manage runoff and tile water coming off one field section
- Evaluate how well it manages water quality in the periods when cover crops are not effective

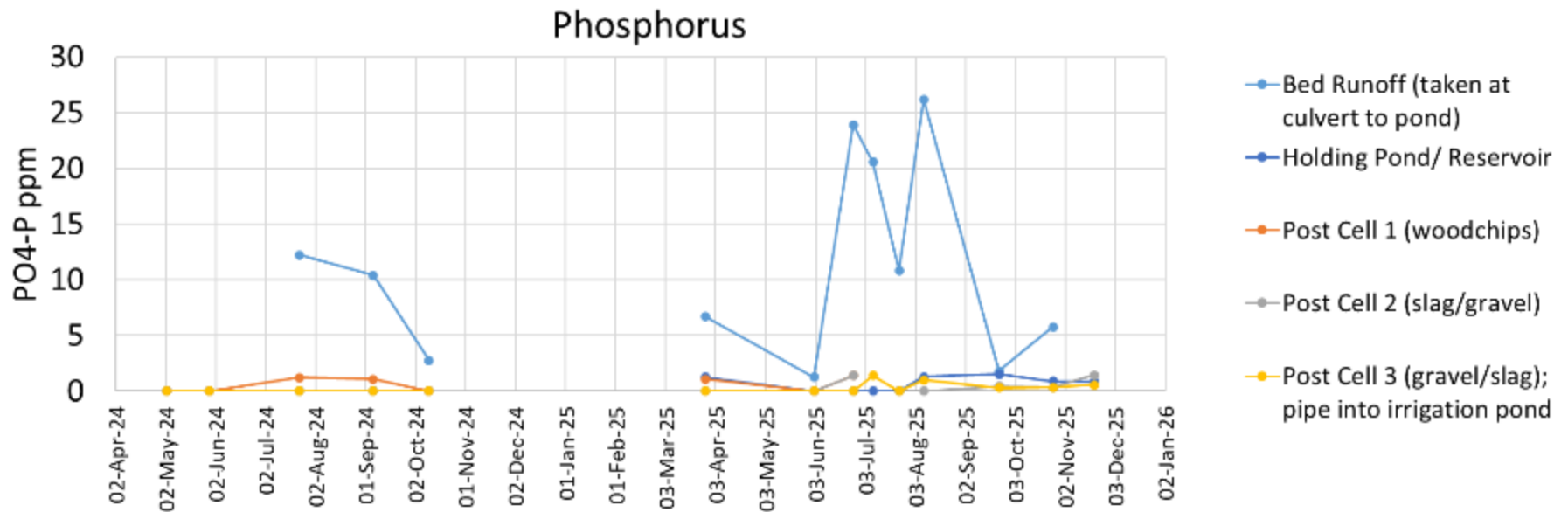
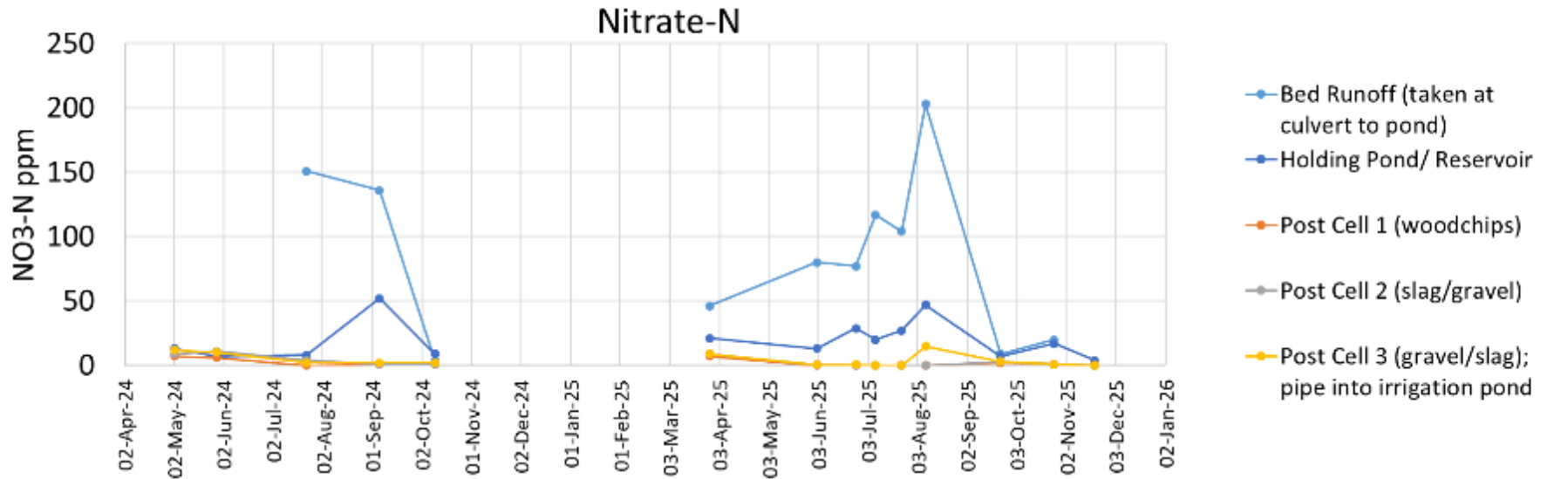
# ON HTSwale Site 2



Extensive Container Beds



# ...some data



# ON HTSwale Site 3

- New build
- Installed Dec 2025



# A bit more complicated...



# Survey.... VRIC survey, Prairie CC survey etc for inspiration...

- Are they thinking about soil health? Is it an issue? Why/Why not?
- Are they measuring it? How? Lab tests? Visual observation? Crop health?
- What management practices (BMPS) are they using? CC? OA? Reduced tillage?
- Current extent of cover cropping?
  - Reason for doing it? (Erosion? Compaction? Nutrients?)
  - Where/when in the crop cycle?
  - What CCs?
  - Observed benefits? (less chemicals? Reduced erosion? Reduced compaction?....)
  - Challenges? (Management? Diseases? Limited choice? Limited window of application? ...)
  - What help do they need
- Current extent of OA amendment?
  - Where /when applied?
  - Source?
  - Observed benefits?
  - Challenges (Sourcing? Cost?...)
- Current extent of reduced tillage?
  - Where/when?
  - Observed benefits?
  - Challenges (Sourcing? Cost?...)



# Project Team

## Research Team & Technical Advisory Committee

- Dr. Ann Huber, Allison Murphy, Margaret Ribey, Don King, Ted Taylor: SRG
- Dr. Jeanine West, PhytoServ
- Dr. Guillaume Gregoire, U Laval
- Dr. Deborah Henderson, KPU
- Dr. Dieter Geesing, U Fraser Valley and BC Ministry of Agriculture
- Cassie Russell, Stephanie Vickers, Dr. Anna Crolla, OMAFA
- Patrick Handyside & Sonja Fransen, AAFC
- Dr. Laura van Eerd

## Financial Support

- Canadian Nursery Landscape Association
- Landscape Ontario
- BC Landscape & Nursery Association
- Landscape Alberta
- IQDHO
- Quebec Vert
- **Nursery growers across Canada**

# Questions ???

# Where we are...

Site ID	Field Tasks	2024-2025	2025-2026	2026-2027	2027-2028
ON Site 1	pedology & benchmarking	July			
	soil health sampling	July	June, Oct	✓ ✓	✓ ✓
	CC + OAs	planted	planted	✓	✓
	erosion monitoring		Oct/Nov	✓ ✓	✓ ✓
	tile water monitoring (flows and conc.)	grab	grab; agridrains & ISCOs	autosamplers	autosamplers
ON Site 1 HTS				installed & monitoring	✓
On Site 2 HTS		installed & monitoring	✓	✓	✓
ON Site 3 HTS			installed & monitoring	✓	✓
Laval	site preparation		Sept		
	CC + OAs		Sept	✓	✓
	soil health sampling		Sept	✓ ✓	✓ ✓
	erosion monitoring		equip refurbishing	autosamplers	✓
	tile water monitoring		equip refurbishing	autosamplers	✓
Alberta	pedology & benchmarking		Sept		
	CC + OAs			spring	✓
	soil health sampling		Sept	✓ ✓	✓ ✓
BC	pedology & benchmarking		Sept	✓	✓
	CC + OAs			spring	
	soil health sampling		Sept	✓ ✓	✓ ✓
Survey				✓	✓