

# *Evaplant* Evolution:

Collaboration achieves circular success



ramo.eco

SWANA Northern Lights: Living Daylights 5 minute Lightning Talks  
John Lavery Ramo - Western Division

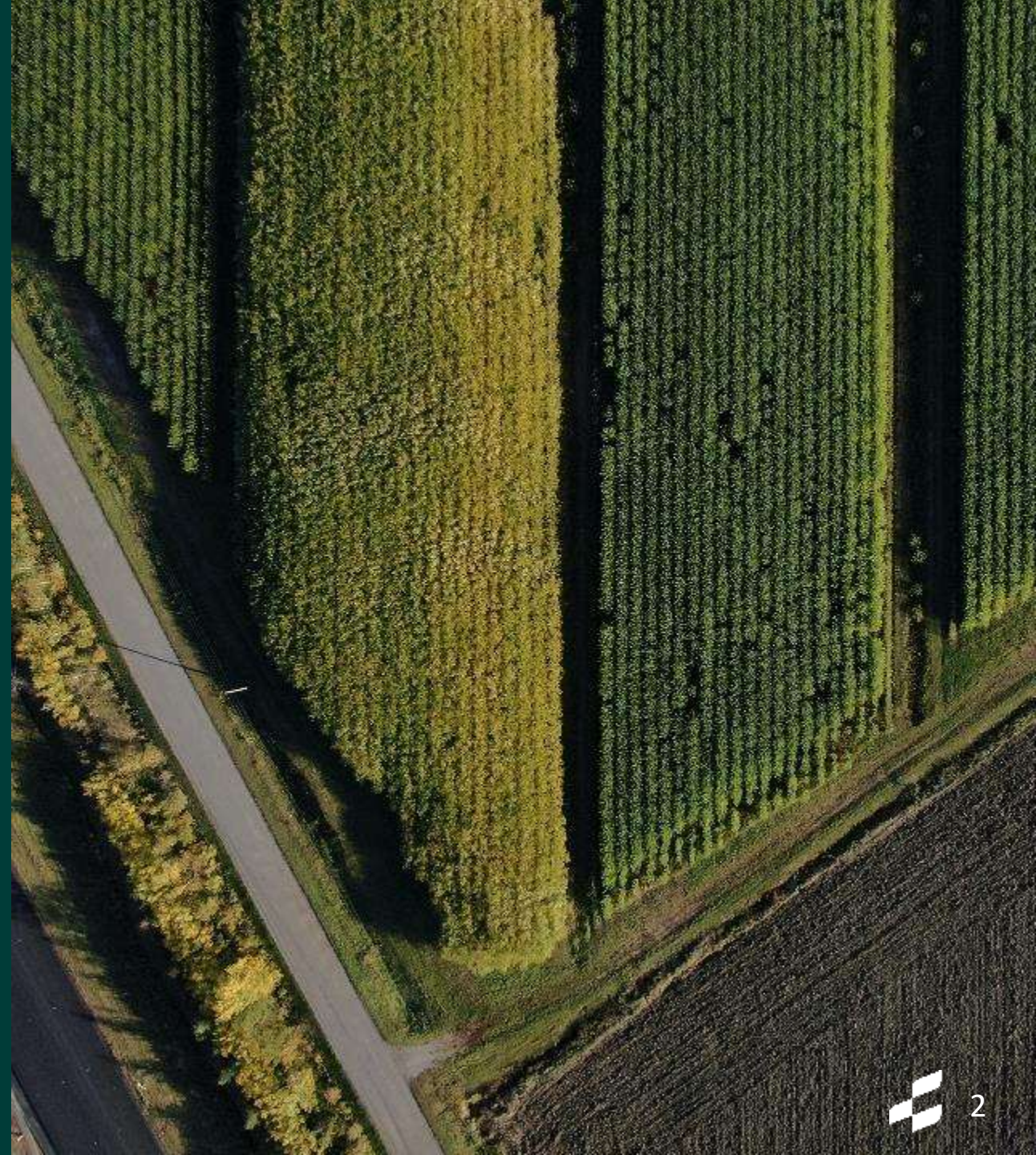


## Our Company:

North America's experts in willow cultivation and use

## Our Mission:

Repair the world using woody nature-based solutions.



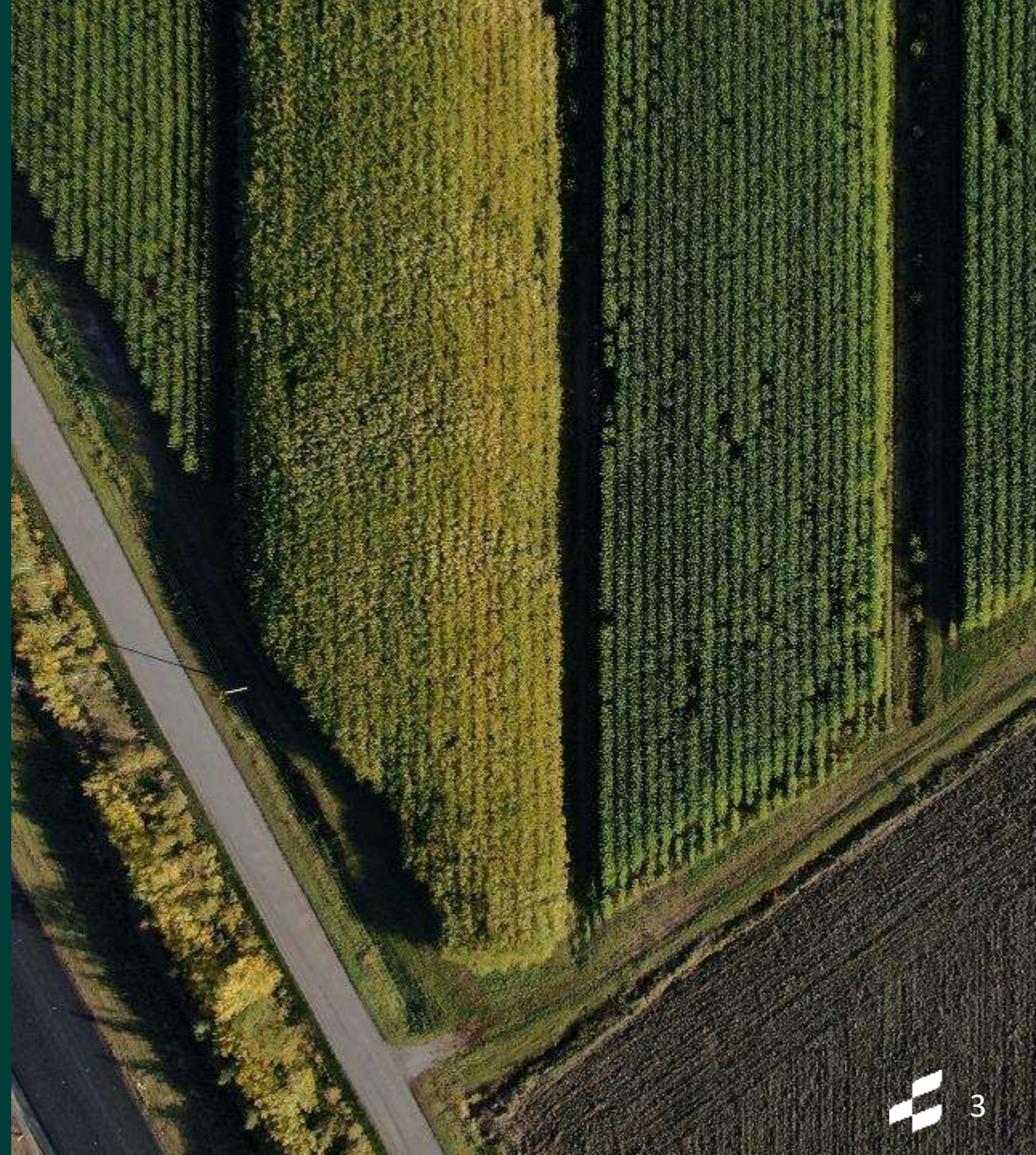


## In 2015 we knew:

- Willows are thirsty.
- Willows are resilient.
- Willows are productive.
- Willows are useful.
- Willows grow well in
  - wastewater effluent
  - C&D leachate
  - biosolids

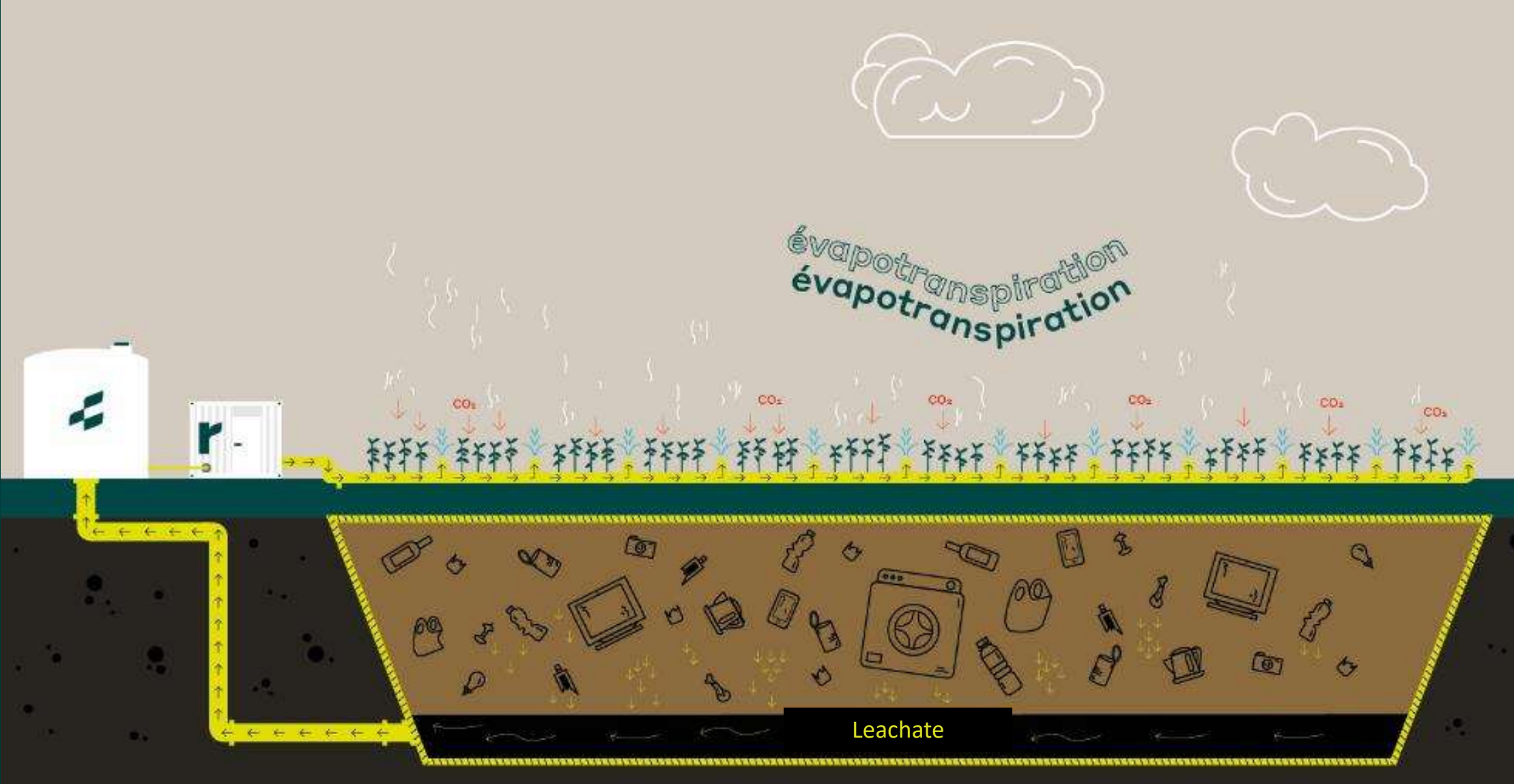
## We wanted to:

- Take our mission to the landfill and use willows to manage the water burden in a landfill
- Do so without percolation or discharge
- Retain 100% of contaminants within the landfill footprint





# EVAPLANT Technology Concept:



# EVAPLANT Technology questions/uncertainties:

How closely will we have to monitor the weather?

Can we figure out maximum irrigation rates based on the weather?

How concentrated can the leachate be?

Will toxicity reduce our irrigation rates?  
Will it kill the trees?

Will we need to pre-treat?  
Or flush with water?

Which genetic varieties will perform best?

Can the trees handle it?

évapotranspiration  
évapotranspiration

What contaminants end up in the tree?

Manned?  
Or remote?

How can we prove that there is no percolation?

Sprinkler or  
Drip?

Can we work on top of a capped cell? An open cell?  
Do we need a liner? Can we work in an adjacent field?

Leachate

# How do we answer those questions?

- Expertise – some but not all.
- We have some of the skills, but not all.
  - *Academic skills*
  - *Client preferences*
  - *Regulatory guidance*
- Time and money.



## Evolution is the solution.

*From:* North America's experts in willow cultivation and use

*To:* Cultivating nature-based solutions through partnership and collaboration

# Ramo's Evaplant Evolution-Revolution

Developing nature-based solutions collaboratively with our partners

- Academic Partners

- Master's and Doctoral Students
- Research groups

- Client Partners

- Municipalities
- Landfills
- Large Waste Companies

- Funding Partners

- Federal Academic Funding
- Federal Granting
- FCM Green Municipal Fund
- Provincial Innovation Centres

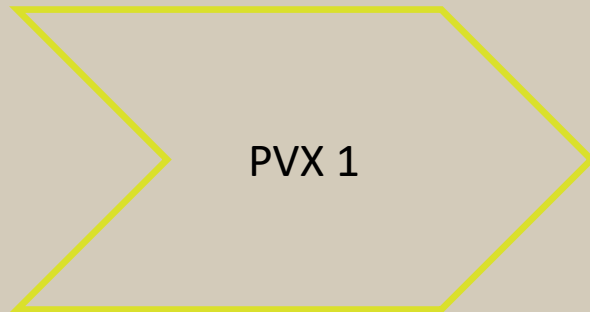
- Regulatory partners

- Guidance and perspective



# Development pathway – not everyone at once!

2018-2019

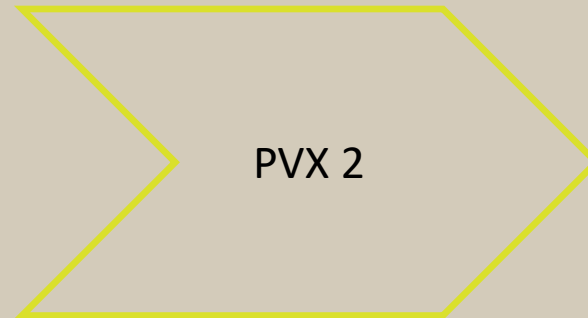


PVX 1

Labroatory scale  
concept validation



2018-2021

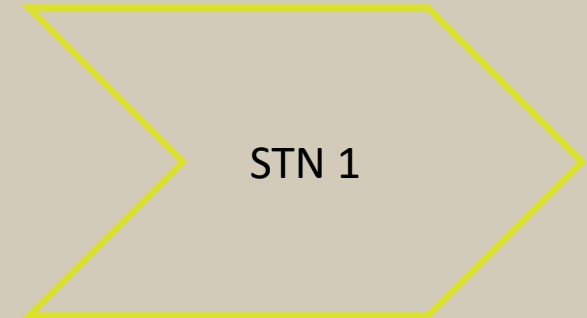


PVX 2

Pilot Project



2019-2022



STN 1

Pre-commercial /  
commercial Scale-up





# What did collaboration give? What did it take?

Our collaborations gave Ramo better

- Knowledge
- Networks
- Tools
- TAGs and Champions
- Pathways to success
- Perspectives

Our collaborations took away

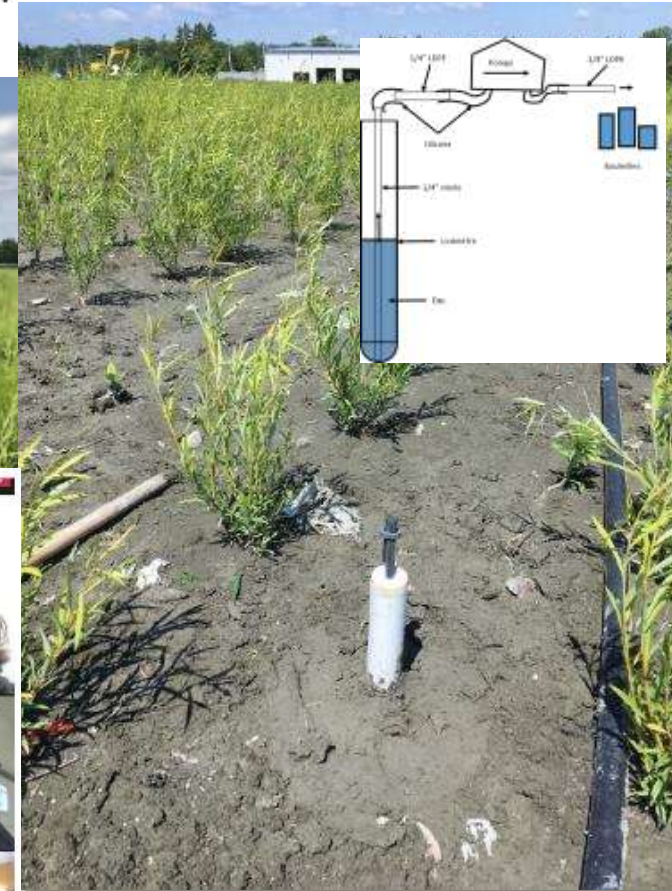
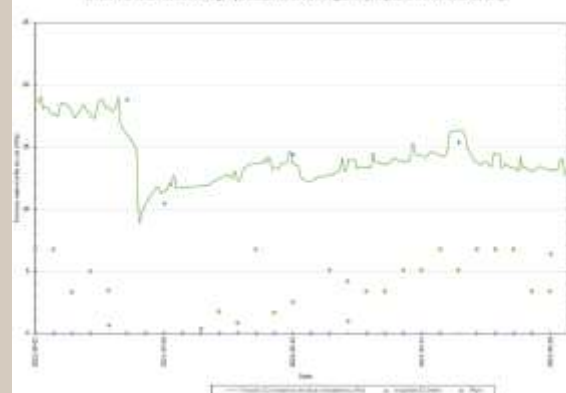
- Fear
- Myopia
- Vanity

Bioenerg. Res. (2015) 8:775–787  
DOI 10.1007/s12155-014-9550-5

## Willow Root Development and Morphology Changes Under Different Irrigation and Fertilization Regimes in a Vegetation Filter

Ahmed Jerbi • Werther Guidi Nissim • Rémy Fluet • Michel Labrecque

Evolution spatiale de la salinité et charge hydraulique de la zone à égout et précipitation en fonction du temps



# What is next?

## New Challenges in Landfill Leachate

- L'ouest (AB, SK, MB, BC)
- PFAS (the forever boogeyman problem)
- Sodium and salinity
- Slopes
- Stormwater *and* leachate
- Caps without irrigation to reduce leachate (Evacap)

## New Horizons for Evaplant/Evacap

- Full scale Digestate and Effluent
- Impacted Mine Water



So, anyone up for a little...

...Collaboration?





Up for collaboration



Degraded site afforestation



Leachate/wastewater management



Biomass value and carbon sequestration

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