Terramera

The Future of Soil Carbon Quantification

Supporting farmers and ranchers to verify carbon sequestration for economic, soil and climate health

Since 2010, our **integrated operations** have grown to include HQ in Vancouver, BC, research labs, growth chambers, greenhouse and a research farm

Terramera

"How can we use technology to unlock the intelligence in nature to ensure an earth that thrives and provides for everyone?"



C\$100M+ Raised in funding; privately held.





Foundational chemistry platform designed to enhance the efficacy of synthetic chemicals and natural products used in agriculture



Machine vision-driven machine learning models to speed discovery, development and commercialization of products and services Products

Commercial crop protection

RANGO

Natural pest control consumer products





250+ patents

granted and pending in IP portfolio



130+ employees

quadrupled workforce since 2017; R&D team includes biologists, chemists, entomologists, plant pathologists, machine learning engineers, software engineers and robotics engineers. **Terramera's Core Question** How can we use technology to unlock the intelligence in nature to ensure an earth that thrives and provides for everyone?

Terramera's 2030 Audacious Goals

4





The Problem: Inefficiency

Pests, disease and weeds reduce crop yields by as much as 40% globally.

Every year, we use 2M tons of pesticide globally.

Despite all the chemicals applied, 50-90% gets washed into the environment, depleting soil carbon.



Netherlands has 155-times more exports per acre of farmland than Canada



The Potential

Potential for **Trillions** in new economic value from Canadian farmland by reaching Dutch efficiency levels. At just 10% of the Netherlands' jobs per acre, Canada could **double jobs** in agriculture, building local & rural economies.



Canadian Net Farm Income (in billions) 2016-2019

The Problem: Thin Profits

Inefficiencies and uncertainties result in thin farmer profits...

Even before COVID, <u>Canadian Net Farm</u> Income dropped 55% from 2016 – 2019.

With COVID, the "breadth and depth of issues impacting the agrifood policy landscape in Canada has perhaps never been more challenging." <u>Agri-</u> <u>Food Economic Systems</u>, Aug 2020

"When farmers struggle financially, the agriculture sector and Canadian economy suffer too." <u>Western</u> <u>Producer</u>



7



The Opportunity: Ag can be a massive Net Sink of Carbon

Given that human agriculture activities shape 50% of habitable land on Earth (and about 37% of the Earth's total land area), there is a huge opportunity in transforming this vast area **to a net sink of atmospheric carbon.**

Farmers are *Canada's largest opportunity to combat climate change* through carbon sequestration.



Carbon Cycle (GT)





The Opportunity: Soil as a massive carbon sink

By unlocking the carbon market for soils, we will create more profit for farmers, more resilient agriculture communities, and drive large-scale carbon drawdown.



"Soil carbon is a potential \$100B+ market opportunity that creates benefits for all stakeholders involved."



Soil Carbon In Canada

Soil Carbon represents an enormous potential global carbon sink Canada has **160,000,000 acres of farmland**.

Each farmland acre can sequester 0.75-2+ tonnes/year, up to at least 10-50t/acre.

This represents an **opportunity to sequester 1.6-8GT** across Canadian Farmland

Positive ROI for farmers in medium to long-term If mobilized, Canadian farmers could drawdown 1.6GT by 2050 Opportunity for \$15-30B in new revenue for farmers by 2050





Barriers to Scaling Soil Carbon Economics

1. High Cost of Soil Carbon Quantification & Verification

• Physical verification is not feasible; too costly to scale

2. Trust: Reliable Data for Soil Carbon Monitoring & Tracking

 Proxy approaches use assumptions of carbon sequestration based on activities, inputs and soil type to create an estimate. Not accurate enough for carbon trading across a country

3. Education: Onboarding & Agronomy Support

• Tools and activities need to be easy for farmers to implement, adopt and trust



Terramera Breaks the Barriers With Technology

Terramera has game-changing capabilities in computational chemistry, machine learning, artificial intelligence and sensor design.

For carbon markets to thrive, they require **clear validation** so buyers can be confident of their purchases. Accurate quantification of soil carbon currently requires on site sampling or analysis.

Our technology will enable mass quantification of soil carbon using **remote sensing** from satellites and/or high-altitude drones, reducing costs and increasing the land that can be analyzed. The technology can be used to validate Canadian and global carbon markets.

We can train a model from "ground truth" up to satellite that can classify agricultural practices associated with soil carbon accumulation and use it to validate carbon credits.







13

Inexpensive, Reliable Soil Carbon Quantification



Launching Initial Pilots in 2021

We're launching pilots in BC / Alberta this year: **300,000 acres over 3 years**

Funding to support farmer participation, soil sampling, and de-risking the transition to regenerative agriculture.

Major partnerships will be announced soon.



- 10-20 farms
- BC / Peace River
- Enrollment Process
- Advisory Council

• Roll out to 100+ farms, supporting 50,000 acres

2023

• Roll out to 1000+ farms supporting 300,000 acres

Visit **regenerativeag.terramera.com** to apply to participate



Technology Empo

Technology Empowering Farmers

By focusing on **OUTCOMES**, rather than prescriptive **processes or practices**, Terramera's technology allows farmers to decide what's best to do on their land and be rewarded for their **actual** results.

"What's good is what's good for the land." - Aldo Leopold

