DIGITAL
TECHNOLOGY SUPERCLUSTER

Terramera

Fusing Science, Nature and AI to Transform How Food is Grown

The Company

Terramera is an AgTech company transforming how we grow food and the economics of agriculture by simulating complex systems and the interactions of molecules and taking learnings from and to the field. The company provides solutions to the agricultural industry to reduce the use of synthetic pesticides, increase crop resiliency, predictability and quality, support regenerative agronomy and measure the carbon sequestered through regenerative agriculture.

The Problem

Wheat is a $7 billion industry in Canada. The annual harvest supplies employment for thousands of workers and food security for millions of Canadians and people around the world. The effects of climate change threaten this bountiful agriculture sector. The primary peril is wheat rust. This fungal disease, which attacks small grains, is moving north as temperatures rise. In the past, wheat farmers would have combatted such pathogens by spreading larger volumes and harsher forms of pesticides. This approach is no longer defensible. A much more targeted response is needed.
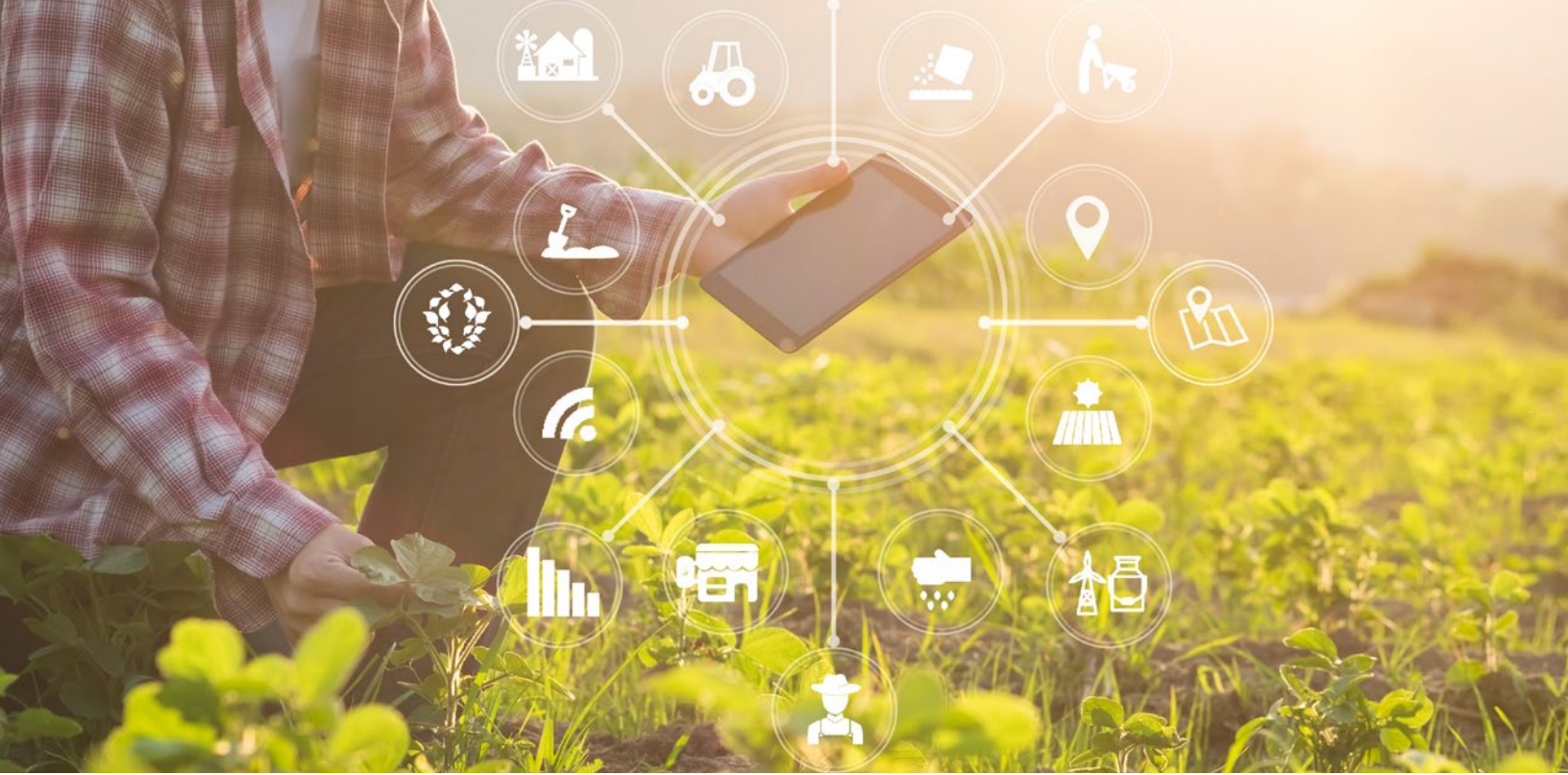
$100M

+ Raised from investors made possible by accelerated product development

135

+ Doubled their workforce, with 30 more jobs added in 2021

80% REDUCTION

+ Of synthetic pesticide load in agriculture globally by 2030

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The Precision Agriculture to Improve Crop Health Solution

Precision Agriculture to Improve Crop Health is that targeted response. Led by Terramera Inc., the multi-partner Digital Supercluster project uses a combination of advanced digital technologies to formulate an all-natural precision fungicide that both kills wheat rust and does not harm human and environmental heath. Put in simple terms, Precision Agriculture to Improve Crop Health pairs the disciplines of computational biochemistry and genomic mapping with the digital technologies of machine learning and robotics.

This combination of advanced knowledge and tools is enabling the project's research and industry partners not only to identify and test a fungicide that targets wheat rust with the utmost precision, but also to develop further pest-management formulations that attack specific diseases that afflict precise crops. The detailed suite of tools involved in Precision Agriculture to Improve Crop Health is unprecedented:

- **Pattern-matching algorithms and mathematical models to summarize and derive meaning from gene sequencing data,**

- **Advanced automated tools to splice and edit specific DNA,**

- **Meta-spectral techniques to compress data down to a fraction of its original size,**

- **Robotics and sensors to operate climate-controlled growth chambers and greenhouses, and**

- **A data trust that serves as a legal framework to manage shared genomic and sequencing information.**

Consortium partners include Compression.ai, Agriculture and Agri-Food Canada (AAFC), Simon Fraser University, Sightline Innovation, and Genome British Columbia.

Measurable Results

The success of Precision Agriculture to Improve Crop Health is equally impressive and varied. Project partners are putting their current wheat rust fungicide through a third generation of iteration to hone its formulation to a knife's edge. Investors are taking notice: The project's success has attracted $100 million to spur further innovation. To keep up with advancing plans, the workforce devoted to the project has grown to 135, with 30 more jobs expected to be added in 2021.

Most exciting of all, the knowledge developed by the project will be applicable to combat other agricultural pests and pathogens, as well as diseases beyond agriculture. Precision Agriculture to Improve Crop Health could even be put into action to **predict new virus strains and pre-design medicines** to fight COVID-19 variants and prevent future pandemics.

The Digital Supercluster is an original co-investor, alongside industry, in this partnership. In addition to accelerated product development and funding mobilization, the Digital Supercluster helped Terramera file a new patent application family that expands Canadian IP protection. The ability to harness complementary areas of science across industry and academia enabled Terramera to rely on the specialized expertise and ingenuity of partners such as Compression.ai. This innovative application of machine learning, will result in a likely savings of hundreds of thousands of dollars over the next several years.

Terramera is committed to reducing or eliminating 80% of the synthetic pesticide load in agriculture globally by 2030, and this project helps advance our goal. By working together, we benefit from expertise developed in other sectors to grow and accelerate our mission to transform how food is grown and the economics of agriculture."

KARN MANHAS, FOUNDER AND CEO OF TERRAMERA

Learn more about The Precision Agriculture to Improve Crop Health Solution at: digitalsupercluster.ca/projects/precision-agriculture-to-improve-crop-health/