

BIOME
MAKERS

POWERED BY BECROP

ceigram

Centro de Estudios e Investigación para la Gestión
de Riesgos Agrarios y Medioambientales



UNIVERSIDAD
POLITÉCNICA
DE MADRID

POLITÉCNICA

Soil Intelligence

**Modelizando la bioactividad del suelo
para la resiliencia agraria**

Abril 2026

Sobre nosotros



Fundada en Silicon Valley, California, en 2015, **Biome Makers** es uno de los principales líderes globales en AgTech, estableciendo el estándar en salud del suelo con la tecnología **BeCrop**®, que combina la base de datos taxonómica de suelos más grande del mundo con IA para proporcionar inteligencia accionable a la industria.

Nos **conectamos con la biología del suelo para la toma de decisiones agrícolas** con el fin de optimizar las prácticas agrícolas y revertir la degradación de los suelos cultivables.

Cofundadores

Adrián Ferrero y Alberto Acedo



A World-Class Team

Combining Science, Tech, and Commercial Scale



Headquarters

California

Global Team

50

Nationalities

17

PhD.

14

Experience (yrs)

350



Co-Founder & CEO
Adrián Ferrero



Co-Founder & CSO
Alberto Acedo, PhD.



CRO
Sarah Basiri



CTO
Héctor Ortega, PhD.



CIO
Miguel Garrido



COO
Maryam Chouli



Head of Finance
Carlos Rodríguez -Maribona



Innovation Manager
Irene Baena, PhD.



Advisory Board Member
Dan Burdett
24yrs industry experience



Advisory Board Member
Jay Vroom
30yrs industry experience



Advisory Board Member
Beatriz Arrieta
20yrs industry experience

¡Alcance global!

Tracción probada con distribuidores y agricultores de todo el mundo



Países

56+

Agricultores afectados

a 32.000+

Ha mejora en la biodiversidad

895.450+

Mayor base de datos taxonómica

55M de microbios identificados

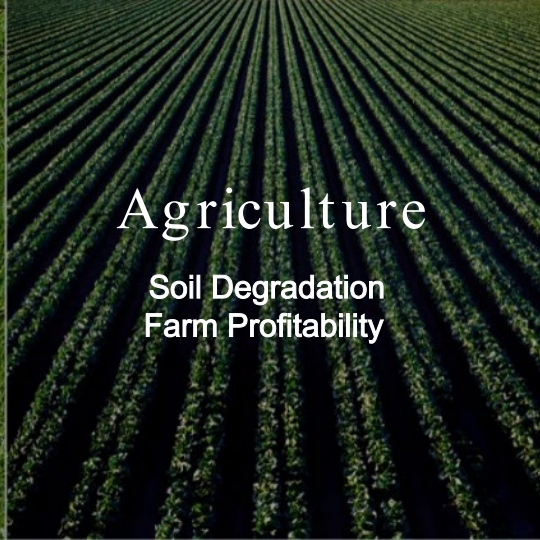


📍 Laboratorios y socios





Global
Population Growth
Climate Crisis



Agriculture
Soil Degradation
Farm Profitability



One Health

Healthy soil is the foundation that links food quality, nutrition, and human well-being.

It all starts with soil...



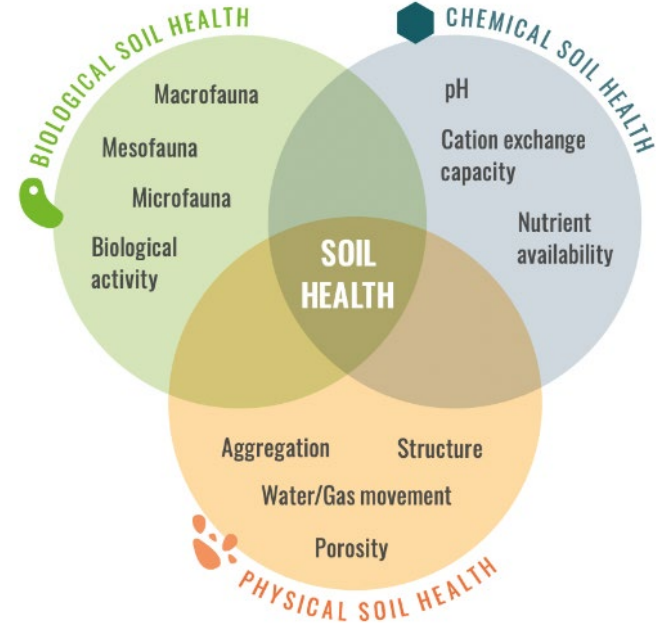


©

Soil Health (FAO)



Soil health is “the ability of the soil to sustain the **productivity, diversity** , and **environmental services** of terrestrial ecosystems” (FAO, 2020).



ECOSYSTEM SERVICES

PROVISIONING

Plant production (food)
Biotechnology

SUPPORTING

Habitat
Biodiversity conservation

REGULATING

Climate regulation
Atmospheric composition
Hydrological services

CULTURAL

Natural capital

Soil health is defined by interaction of **chemical, physical and biological** factors (FAO, 2015) with equal importance.



One teaspoon of soil contains more living organisms than there are people in the world

Indicadores de salud del suelo



Assessment of Teabag Litter Decomposition as a Measure of Soil Health, Including Sensitivity to Crop Type and Management System in Agricultural Soils

E. Brooke Hayes¹  | Charlotte E. Norris^{1,2} | John P. Volpe¹

¹School of Environmental Studies, University of Victoria, Victoria, British Columbia, Canada | ²Pacific Forestry Centre, Canadian Forest Service, Natural Resources Canada, Government of Canada, Victoria, British Columbia, Canada

Correspondence: E. Brooke Hayes (brookehayes@uvic.ca)

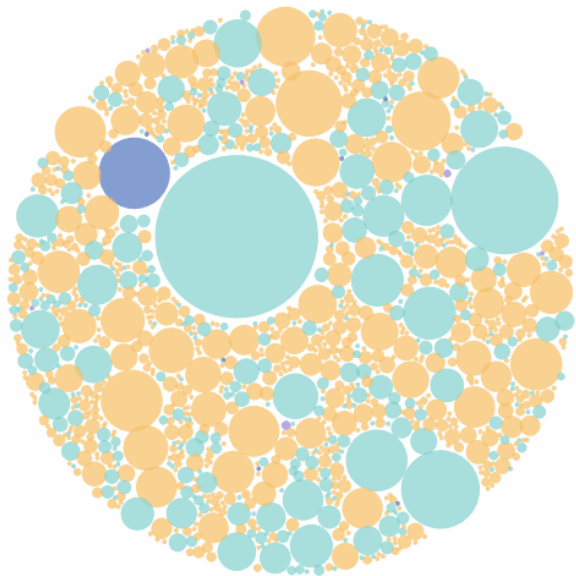
Received: 6 May 2025 | **Revised:** 6 May 2025 | **Accepted:** 15 May 2025



Indicadores de salud del suelo



Fungus Bacteria Archaea Yeast Protist



Search a microorganism...

755 / 755



Abditobacterium sp.

BACTERIA

Acidibacter sp.

BACTERIA

Acidicaldus sp.

BACTERIA

Acidothermus sp.

BACTERIA

Acidovorax konjaci

BACTERIA

Acidovorax sp.

BACTERIA

Acremonium fusidioides

FUNGUS

Acremonium persicinum

FUNGUS

Acrophialophora jodhpurensis

FUNGUS

Actinoallomurus sp.

BACTERIA

Actinocoralia sp.

BACTERIA

Modelizando la función del suelo

Los microbios como bioindicadores fiables



De
la tierra



Biodatos
(mayor base de
datos global)



IA Digital
Portal



Agronómica
Inteligencia



Nuestro
secreto



Mayor base de datos global de
suelos: 55 millones



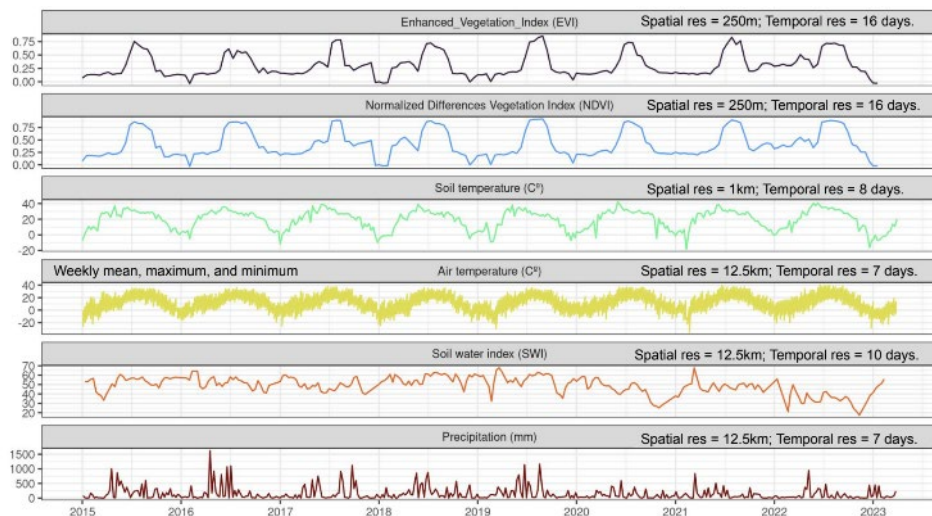
Computación Patentada,
Inteligente, Funcional y Ecológica

Más de 1.000 datos: medioambientales,
NDVI y metadatos propietarios

Conocimientos agronómicos propietarios
basados en LLMs

The relevance of metadata

Structured databases



+ 1,000 time series available of environmental data



Microbiome & Environment



<https://doi.org/10.1038/s42003-022-03202-5>

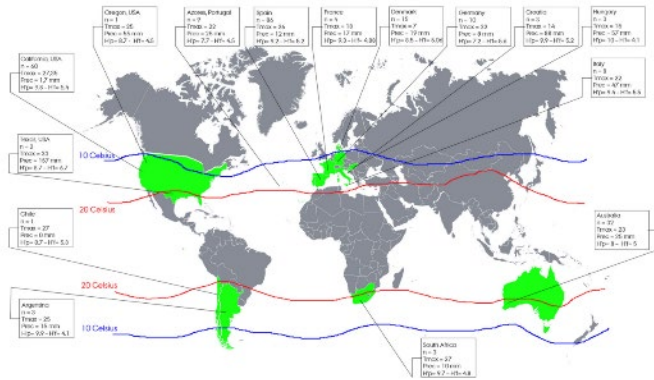
OPEN

A global microbiome survey of vineyard soils highlights the microbial dimension of viticultural *terroirs*

Alex Gobbi¹, Alberto Acedo², Nabeel Imam², Rui G. Santini³, Rüdiger Ortiz-Álvarez², Lea Ellegaard-Jensen⁴, Ignacio Belda^{2,5,6} & Lars H. Hansen^{1,6}



BIOME
MAKERS



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Funciones agronómicas relevantes



Calidad del suelo

- Biodiversidad
- Funcionalidad general
- Resiliencia
- Proporción de hongos a bacterias
- Ratio micorrízica



Sanidad plantas

- Enfermedades de las plantas
- Agentes naturales de biocontrol
- Productores de fitohormonas
- Metabolitos de adaptación al estrés



Ciclo de nutrientes

- Ciclo N, P y K
- Ciclo de carbono
- Descomposición de la materia orgánica
- Ciclo de micronutrientes

BeCrop = Pruebas y Modelado de ADN Amplicon

Best-fit Solution ⓘ

Biosustainability Status

SUSTainability

68.87 A

CARbon

37.95 t/ha

Needs

NUTrition

LOW

HEALTHiness

HIGH

Product advised

BIOSTIMULANT > MICROBIAL BIOSTIMULANT

Bacillus Biostimulant

A subgroup of microbial biostimulants, primarily from the Bacillus genus, known for boosting plant defense and nutrient efficiency.

TARGET



AREA

28.65 ac

Bacillus subtilis

20.23 ac

Bacillus amyloliquefaciens

10.74 ac



F - Esmeralda



Esmeralda Field-42

9.54 ha

SUGARCANE

Nutritional needs

Check for possible recommendations in this field

65 HIGH NEED

Recommended Actions

Organic acids



NUTRITION

Connecting Nature to the Digital World

BeCrop® AI for Soil Health

- Transform soil **microbiome DNA** data into functional and ecological predictions = BeCrop® Indexes.
- Compute in situ and remote **environmental data** (+1,000 parameters).
- Integration of **agronomic insights** and learning from Ag bioproducts testing results.

Unique soil intelligence platform
for data -generated recommendations



Ultimate Field Prescription Tool

Soil Intelligence Platform

BCAs

4,000 trained agronomists

Network of Labs

Global soil health standard
12 lab agreements

1,000 parameters per sample

Soil bioactivities: Functional and Ecological computing
Environmental Data, Satellite Imagery, NDVI (yield maps) and Metadata.



Largest Global Soil Database

55M microbes, 56 countries,
200 crops, 100k samples

A.I. Models (10y training)

Agentic solutions (insights)
AI input recommendation engine



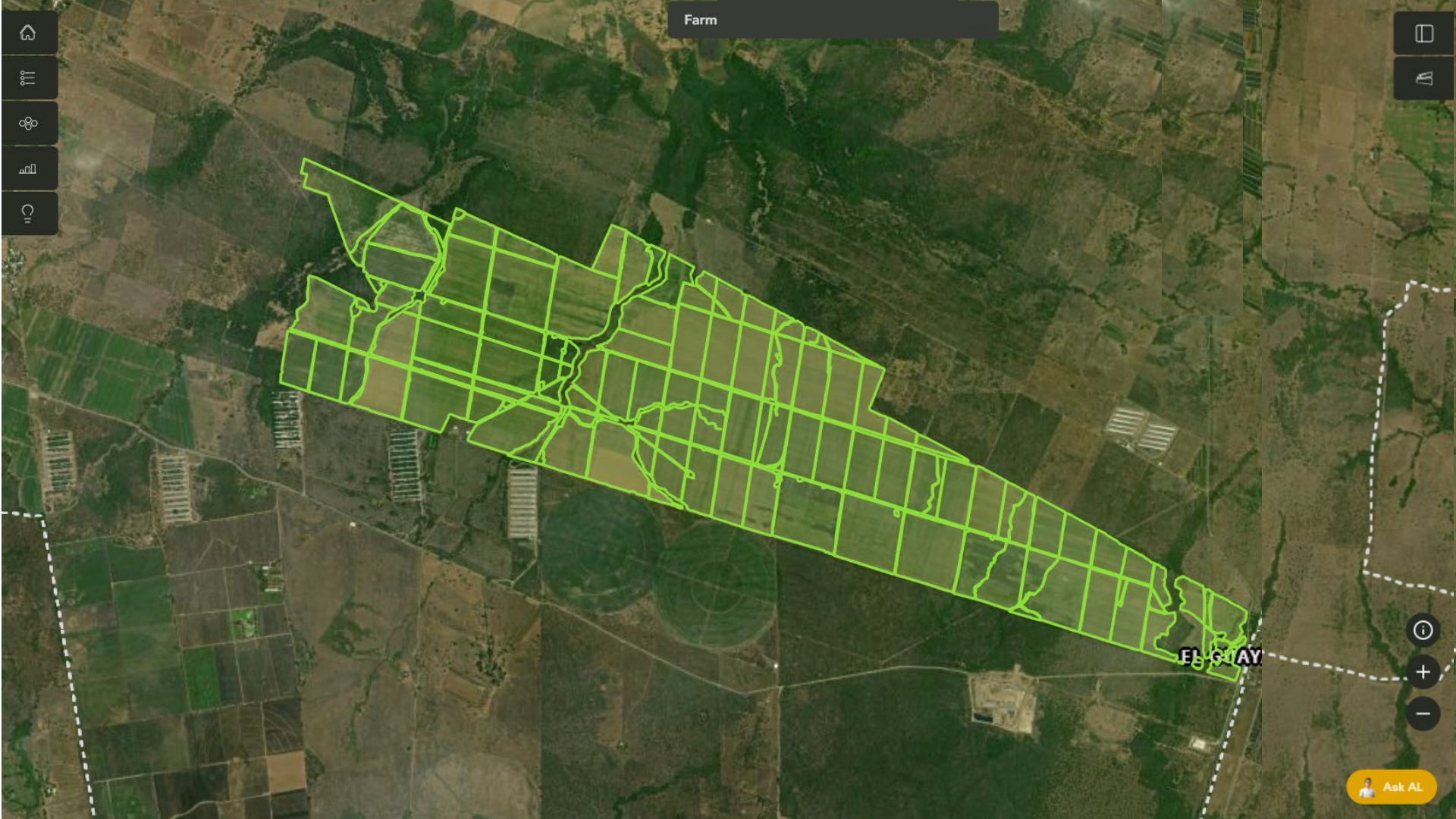
120 academic collaborations
Scientific papers (validation)
16 Patents



Using AI for:
Sample optimization



Farm



Ask AI

EL STAY

AI – Smart sampling tool



Digital soil mapping uses soil samples and biogeochemically-informed predictors derived from remote sensing and environmental data

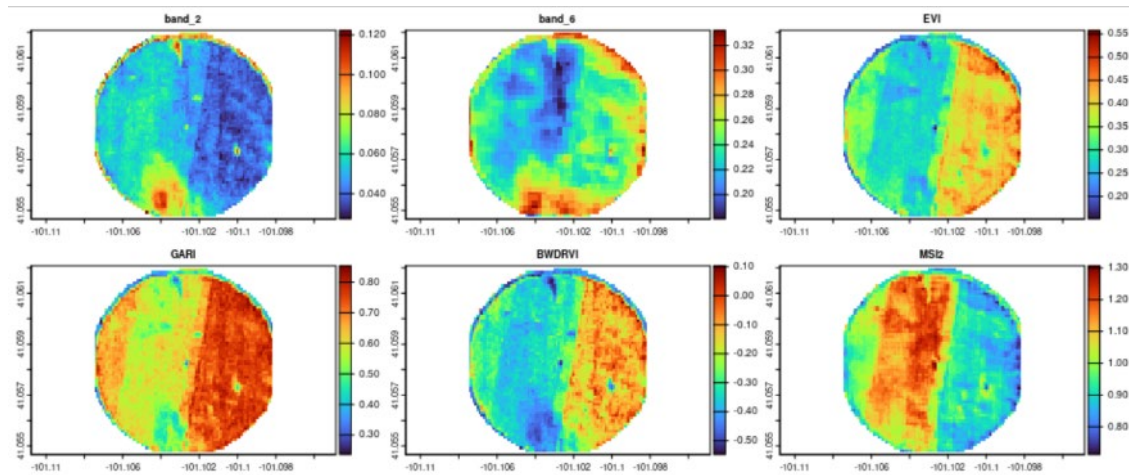
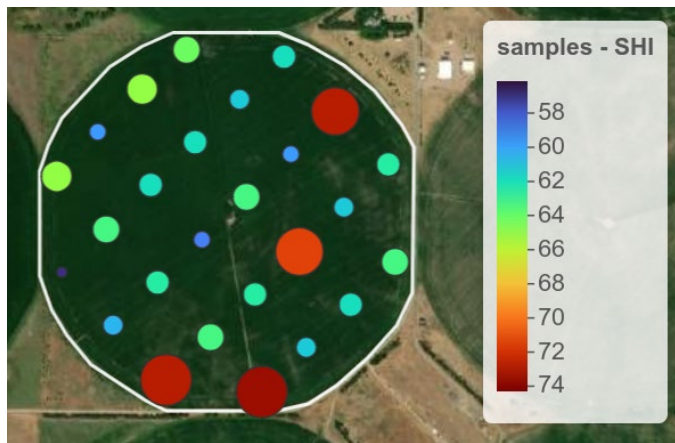
Learning from experience

Soil samples:

- Sample coordinates
- Sampling date
- Parcel polygon
- BeCrop index

Sentinel-2 image (satellite data at 10m):

- Taken at similar date
- 36 predictors (soil and plant cover)



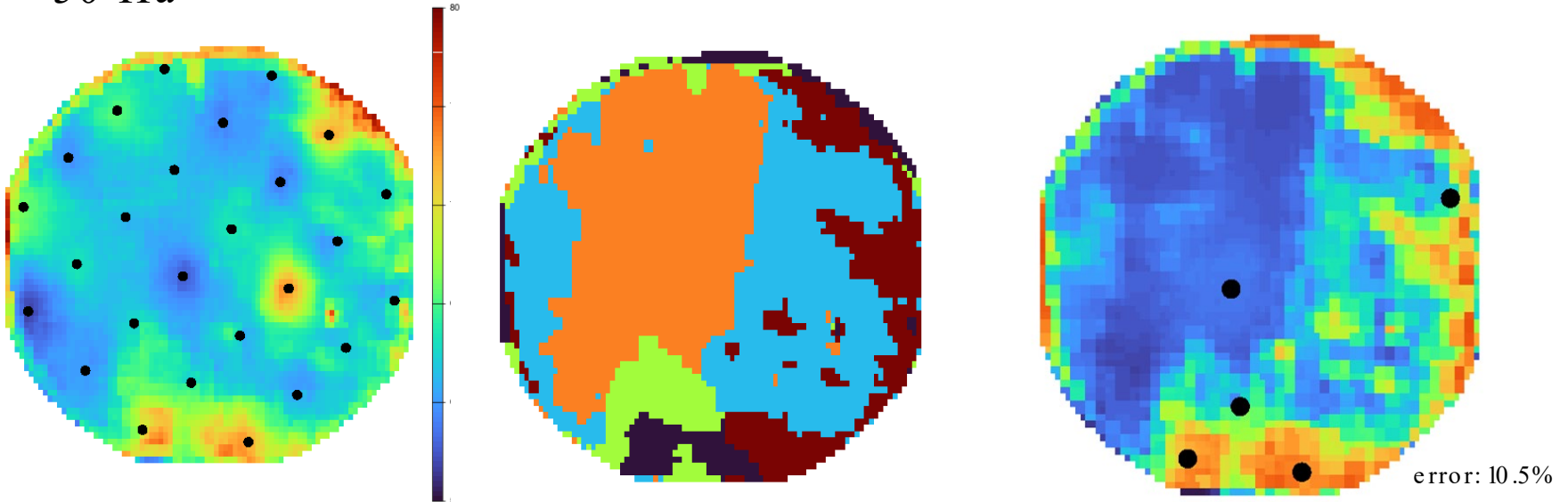
AI- Smart Sampling Tool



Validation: 148 parcels world wide

24 samples
50 Ha

5 zones and 5 samples



BeCrop[®] Farm – AI to solve problems Smart Sampling System



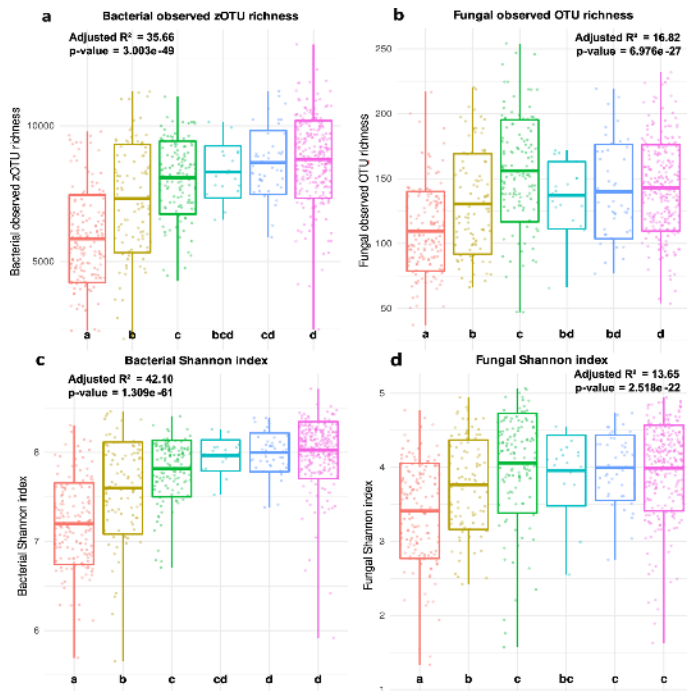
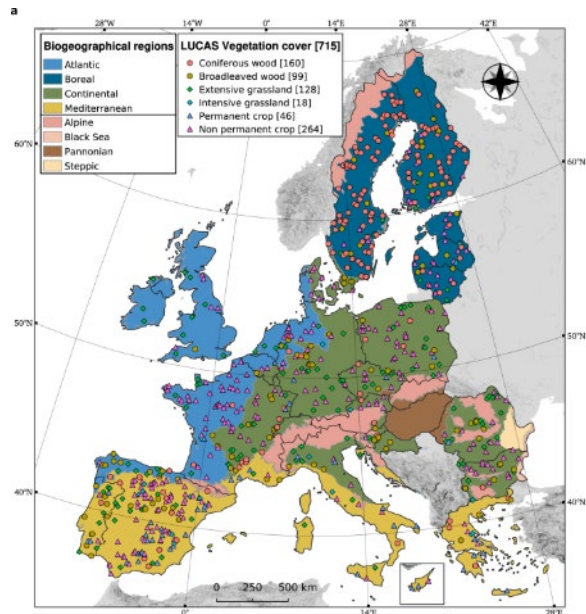
Using AI for: Measuring Soil Health



Diversity

Article | [Open access](#) | Published: 08 June 2023

Patterns in soil microbial diversity across Europe



Diversity







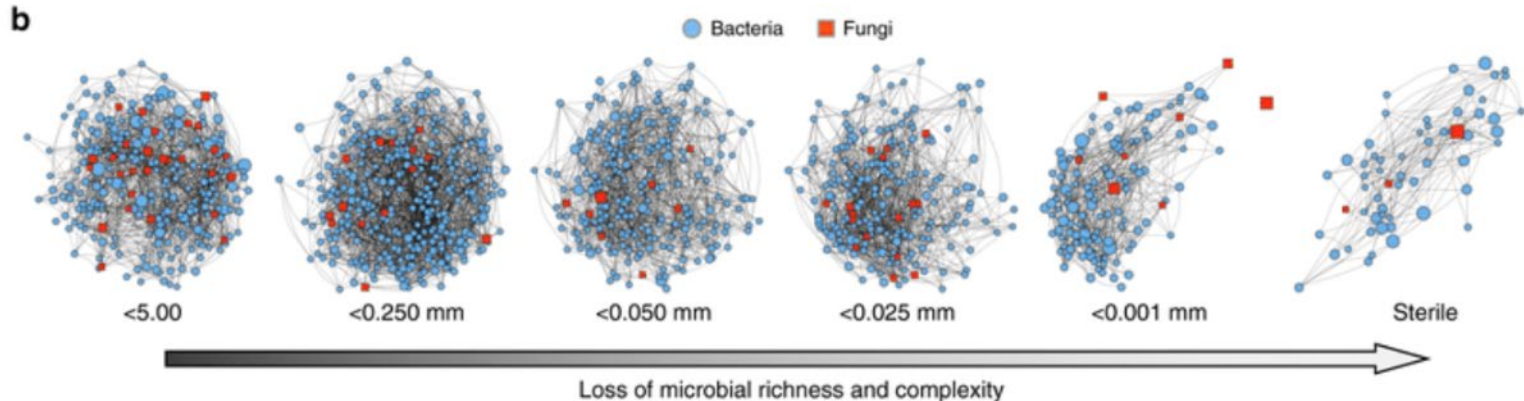
ARTICLE

<https://doi.org/10.1038/s41467-019-12798-y>

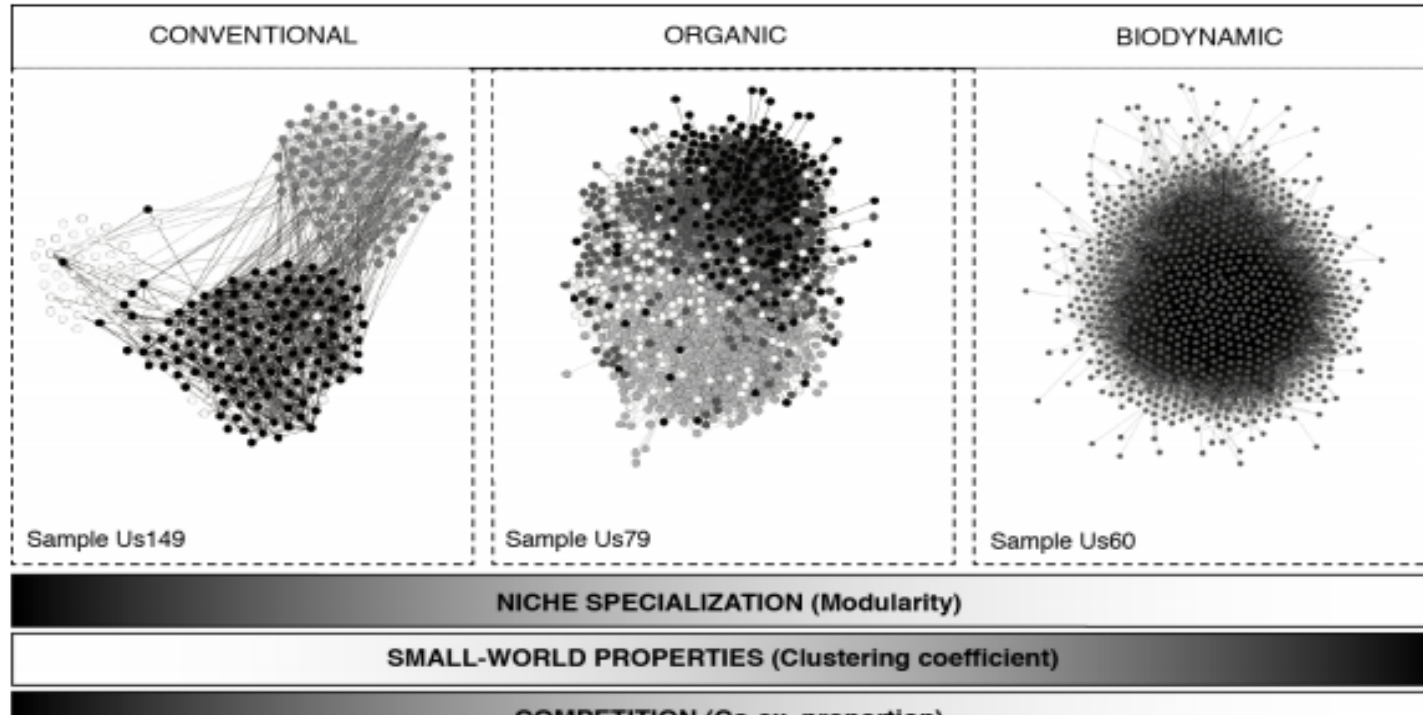
OPEN

Fungal-bacterial diversity and microbiome complexity predict ecosystem functioning

Cameron Wagg^{1,2,3*}, Klaus Schlaeppli ^{1,4}, Samiran Banerjee ¹, Eiko E. Kuramae ⁵ & Marcel G.A. van der Heijden ^{1,6*}



Ecology metrics



Network Properties of Local Fungal Communities Reveal the Anthropogenic Disturbance Consequences of Farming Practices in Vineyard Soils

BeCrop[®] Rate: levels

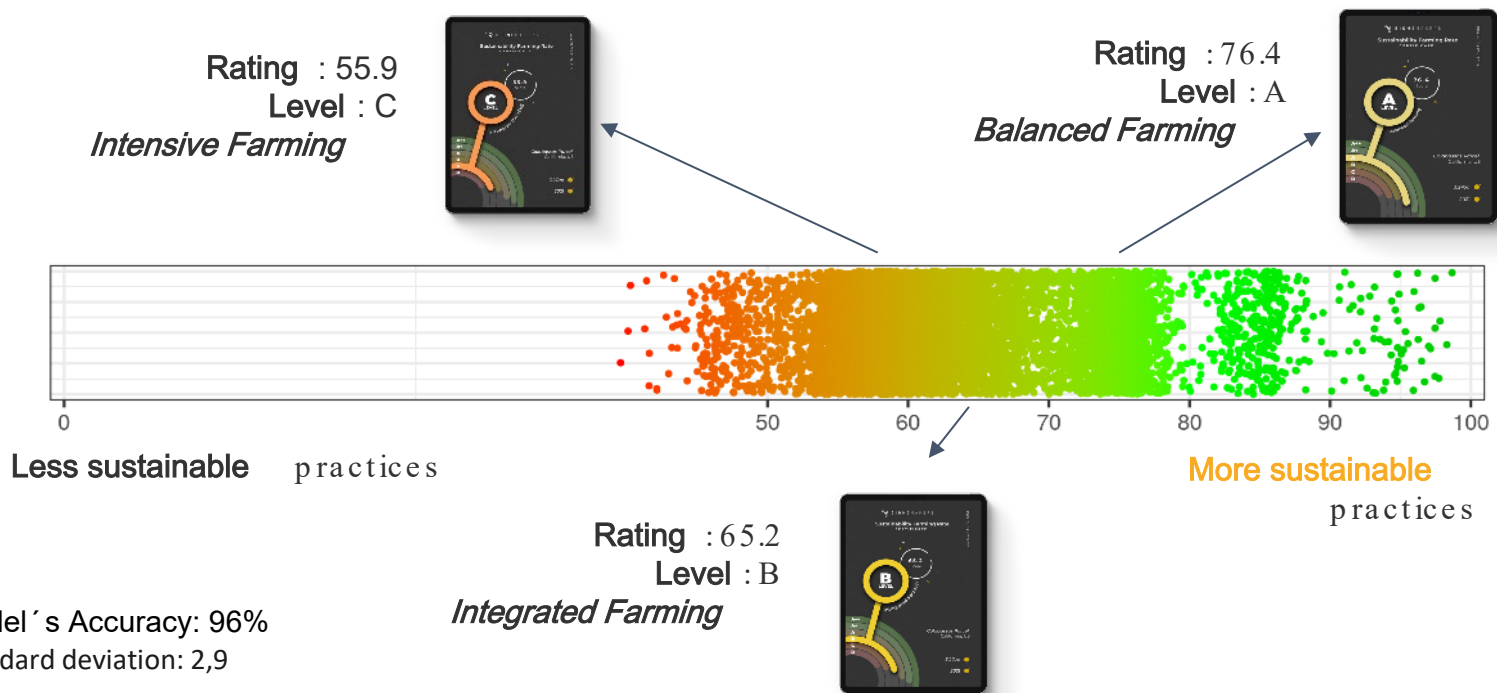


BeCrop Rate Levels

	D	C	B	A	A+	A++
Human Intervention	Harmful	Intensive	Integrated	Balanced	Bio	Wild
<i>Chemical</i>	●	●	●			
<i>Mechanical</i>	●	●	●	●		
<i>Crop Rotation</i>	●	●	●	●		
<i>Biological Inputs</i>	●	●	●	●	●	
<i>Encourage Cover Crops</i>			●	●	●	
<i>Integrated Livestock</i>				●	●	●
ENERGY INTENSITY	VERY HIGH	VERY HIGH	HIGH	MEDIUM	LOW	VERY LOW

BeCrop[®] Rate

BeCrop[®] Rate: score that provides an impact assessment of human intervention on agricultural lands and best management practices- worldwide



Teaching model - Dataset



51,597 samples

Management	Train n = 5000	Test n = 525	Validation n = 46072
Low Diversity (soil after fires)	0.38% (n = 42)	0.38% (n = 2)	0.06% (n = 28)
Conventional	54.08% (n = 2704)	65.33% (n = 343)	12.65% (n = 5830)
Organic	30.54% (n = 1527)	24.19% (n = 127)	3.28% (n = 1510)
Biodynamic	12.34% (n = 617)	8.57% (n = 45)	0.86% (n = 395)
Forestal	2.2% (n = 110)	1.52% (n = 8)	0.59% (n = 273)
<i>Undefined</i>	-	-	82.56% (n = 38036)



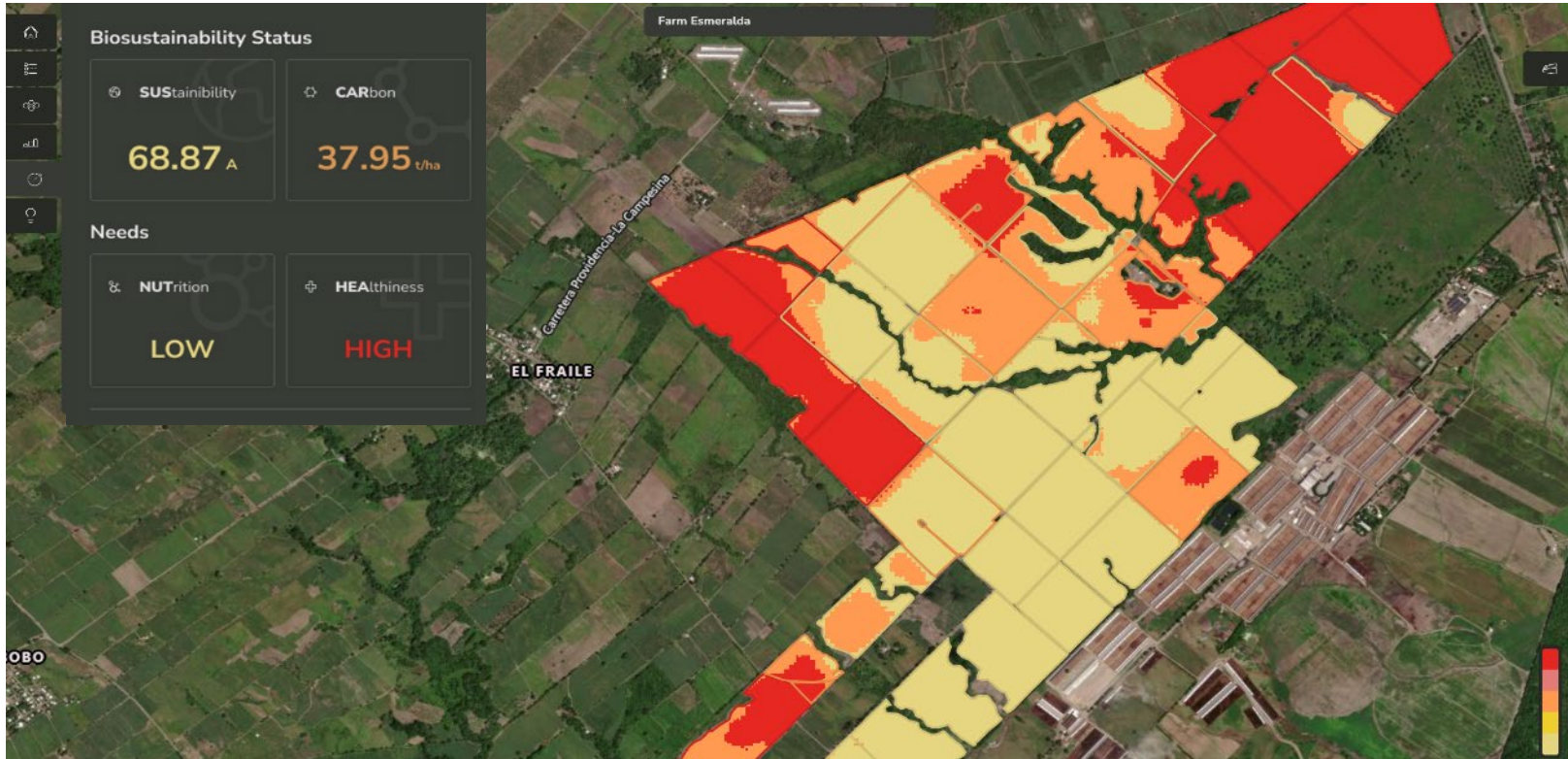
Using AI for:
Biological placement



Bridging the Gap

Effective Biological solutions

BECROP
BY BIOME MAKERS FARM



Biostimulant Landscape



This landscape maps companies developing biofertilizers for commercial food crop production based on publicly available information. It is representative but not comprehensive. Companies appear once, although some offer products in multiple segments. Most of these firms are found in Substances, Microbials or Mixed Portfolios. Circled without icons represent registered segments not considered biofertilizers. Please refer to our 2024 BioControl Landscape for companies offering biologicals for getting crop pests.



Best-fit Solution (i)

Biosustainability Status

(S) **SUS**tainability

68.87 A

(C) **CAR**bon

37.95 t/ha

Needs

(N) **NUT**rition

LOW

(H) **HEA**lthiness

HIGH

Product advised

BIOSTIMULANT > MICROBIAL BIOSTIMULANT

Bacillus Biostimulant

A subgroup of microbial biostimulants, primarily from the Bacillus genus, known for boosting plant defense and nutrient efficiency.

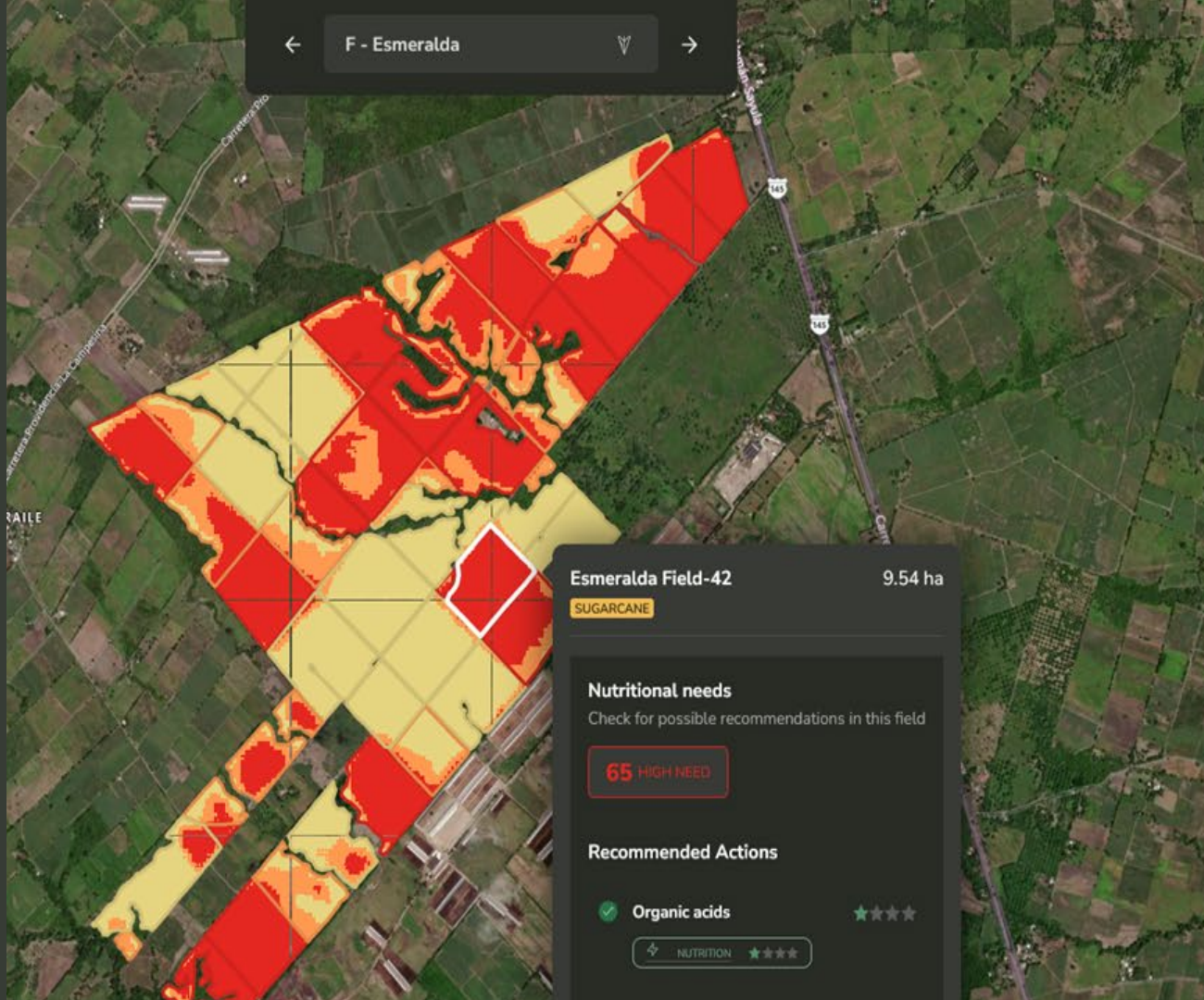
TARGET
(S) (C) (N) (H)

AREA
28.65 ac

Bacillus subtilis 20.23 ac

Bacillus amyloliquefaciens 10.74 ac

← F - Esmeralda →



Esmeralda Field-42

9.54 ha

SUGARCANE

Nutritional needs

Check for possible recommendations in this field

65 HIGH NEED

Recommended Actions

(C) **Organic acids**

★★★★

(N) NUTRITION ★★★★★



I'm AL



I'm AL

Your expert assistant in soil health.

Hey there! 🌱 I'm here to assist you in learning more about how to nurture and enhance soil quality. 🌿



What would you like to learn about soil health?

Can you tell me what is a humic acid?

Humic acid is a group of complex organic compounds formed by the decomposition of plant and microbial matter in soil. It plays a vital role in soil health, plant nutrition, and microbial activity. Humic acids enhance nutrient availability by chelating minerals like iron, zinc, and phosphorus, making them more accessible to plants. They also improve soil structure, water retention, and cation exchange capacity (CEC), fostering better root growth and health.

From a **BeCrop index** perspective, humic acids directly influence microbial diversity (Microbial Balance Index) and facilitate nutrient cycling (Nutrient Availability Index), ensuring optimal plant nutrition. They also enhance the soil's resilience against stressors, reducing disease risks (Pathogen Suppression Index).

If your soil shows imbalances in nutrient cy ↓) or microbial activity in BeCrop analysis, incorporating humic acids (through organic amendments or humic-based fertilizers) can

Message...



Powered by Biome Makers

Using AI for:
Biological inputs



Meaningful trial design

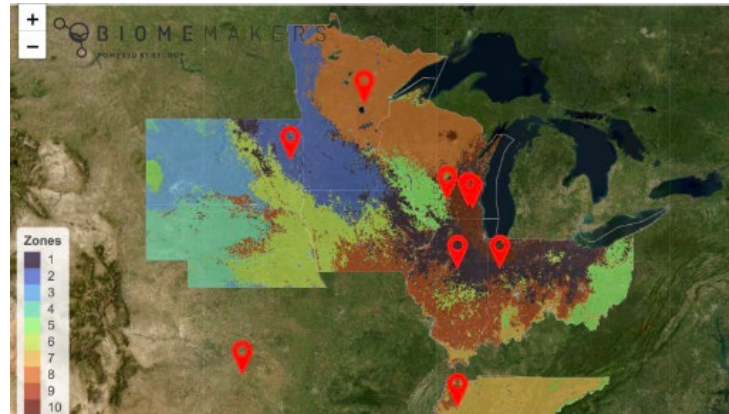
Be sure the trials generate relevant data



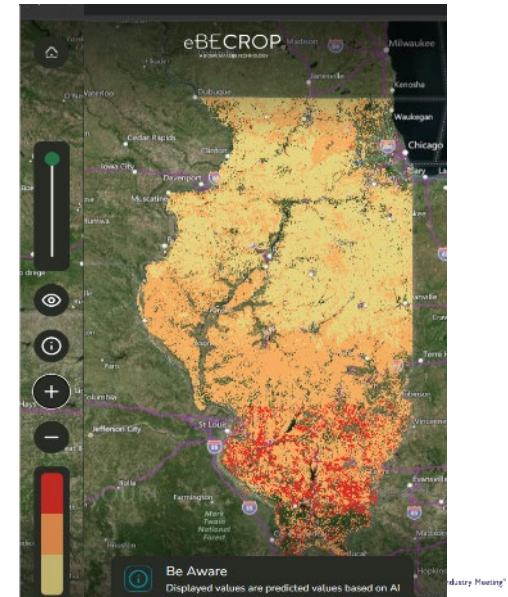
Data Integration



Trials Desing



Modeling Performance prediction



Crop protection Benchmark

Global level



Effectiveness

Botrytis Risk Enhanced

67

Botrytis Risk Enhanced



Biodiversity Impact

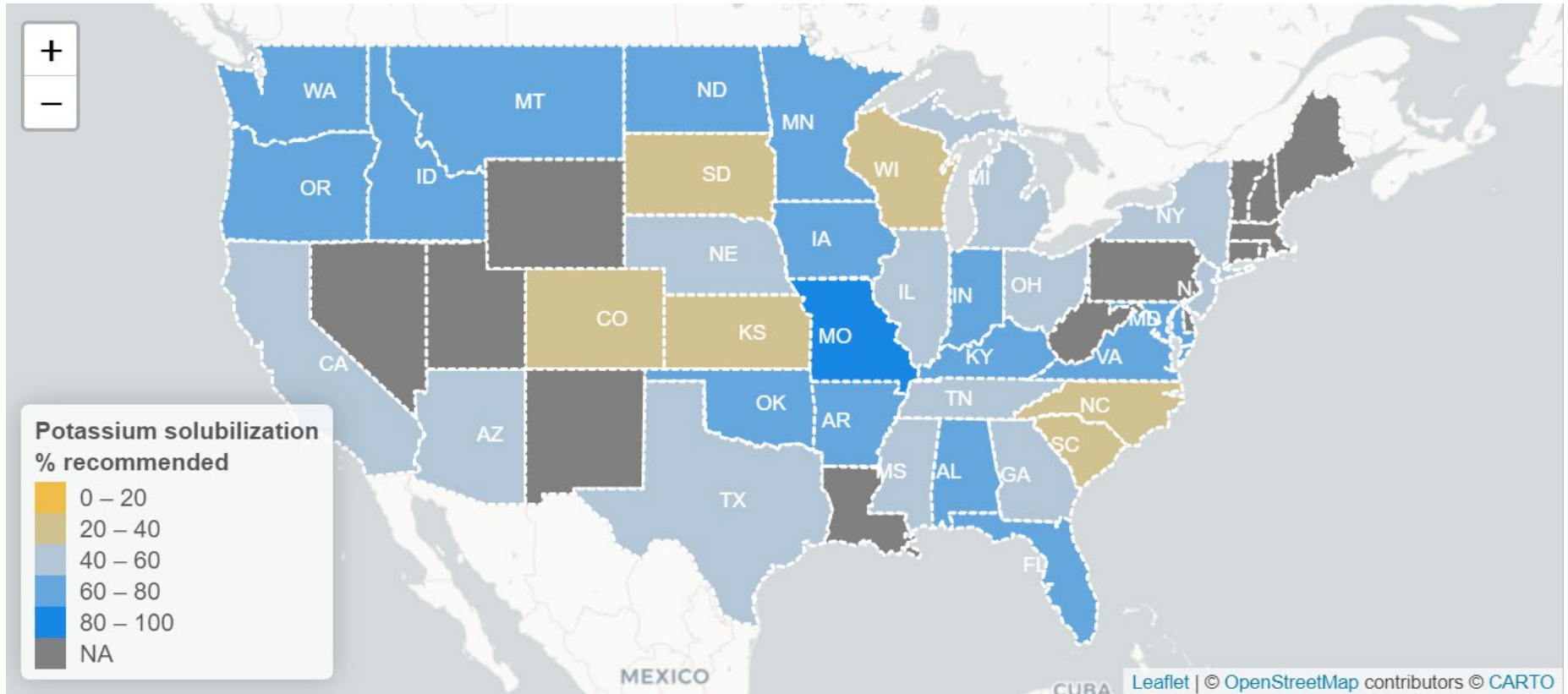
Fungi Biodiversity Worsen

47

Fungi Biodiversity Worse



Defining **comercial strategy** for a Biostimulant product



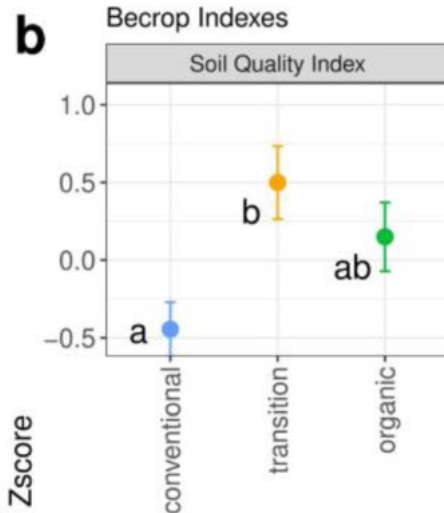
Independent Metrics Validation



U N I K A S S E L
V E R S I T Ä T

Enrichment of putative plant growth promoting microorganisms in biodynamic compared with organic agriculture soils
DOI: <https://doi.org/10.1093/ismeco/ycae021>

0.346) (Supplementary Fig. S1). These results showed how the workflow of Biome Makers index inference works, but also that their databases are superior to the limited literature review that we conducted for their verification. Therefore, we continued our analyses with the Biome Makers indices as described below.



The BeCrop® indexes provide comprehensive information regarding key features of soil health from different perspectives. These indexes include carbon, nitrogen, potassium and phosphorous as well as other micronutrient metabolism indexes along with hormone, stress and biocontrol indicators. Our results indicated that the BeCrop® Soil Quality Index (SQI) reflected agronomic practices, yielding a lower SQI score for conventional practices and a higher score for transitional/organic management systems (Figure 6b). Regarding

Physicochemical Properties and Microbiome of Vineyard Soils from DOP Ribeiro (NW Spain) Are Influenced by Agricultural Management

DOI: <https://doi.org/10.3390/microorganisms12030595>



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