

BeCrop Farm 4.0

Guide

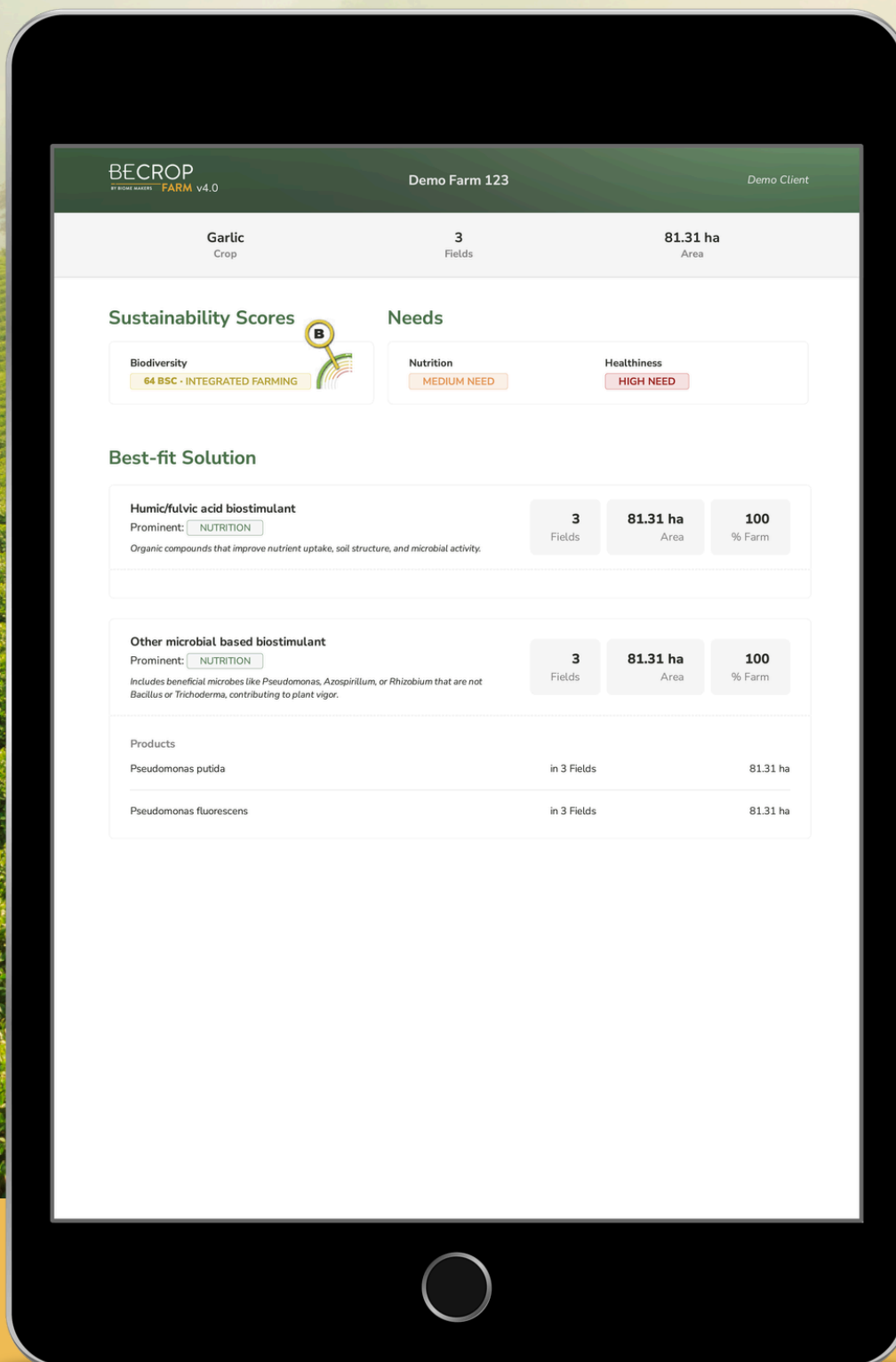


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Introduction

Understanding BeCrop Farm

BeCrop Farm provides an aggregated, macroscopic view of an agricultural operation by integrating soil microbiome analyses from multiple fields. It synthesizes this information to deliver ecological metrics, identify systemic management needs, and recommend scalable biological solutions.

Moving beyond conventional chemical and physical soil analyses, BeCrop Farm uses DNA sequencing technology to characterize the soil microbiome. By analyzing bacterial and fungal communities together with their functional potential, the platform translates complex biological information into practical agronomic insights.

Powered by **proprietary AI models trained on the largest soil database in the industry**, it estimates values across entire farms and fields, not just at sampled points, supporting more informed, data-driven management decisions.

The BeCrop Farm ecosystem consists of four complementary components:

- **BeCrop Farm Digital Platform** – The primary interface for exploring results interactively. It provides the highest level of detail, allowing users to visualize biological information through maps, filters, field-level visualizations, and high-resolution spatial analysis.
- **BeCrop Farm Report** – Provides an aggregated summary of the biological condition of the entire farm, highlighting sustainability, management needs, and recommended biological solutions.
- **BeCrop Field Report** – Presents the biological results for an individual field, offering greater spatial detail and helping users understand variability within each field while maintaining the same biological indicators and interpretation framework.
- **Analytics & Downloads** – Additional tools that allow users to further analyze results, compare information across projects, and export data for reporting and decision-making.

Understanding the BeCrop Score (BSC)

BSC (Becrop SCore) is Biome Makers' proprietary index designed to assess the overall biological health and functional potential of the soil. Rather than focusing on a single microbial group or function, it integrates information on microbial diversity and the functional capabilities of microbial communities to reflect the soil microbiome's capacity to support key processes. It is used as a reference indicator to understand overall soil biological condition and to compare performance across fields, samples, or monitoring periods.

BeCrop Farm Report Highlights

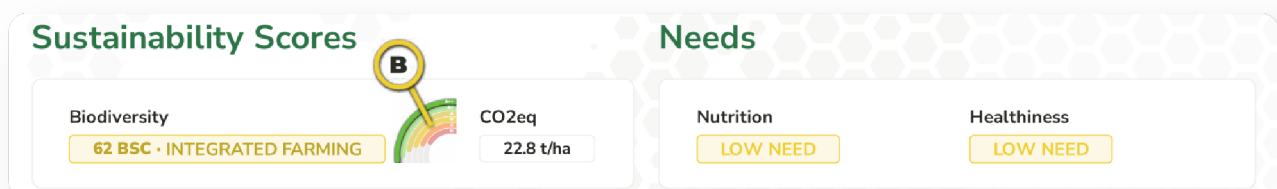
BeCrop Farm Report provides a farm-level overview by aggregating microbiome data across fields, highlighting key sustainability indicators, management priorities, and biological recommendations. Results can also be explored interactively in the BeCrop Farm Digital Platform. The overview is organized into **four main sections**:

Farm Overview

Garlic Crop	3 Fields	81.31 ha Area
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Displays the general information associated with the analyzed operation, including the crop, the number of fields included in the analysis, and the total farm area represented in the report.

Sustainability Scores & Need Levels



Provides a high-level assessment of the farm's biological condition by combining:

Sustainability Scores assess the farm's ecological performance using the BIODiversity index and, when physicochemical data are available, the CARbon CO₂ eq metric.

Need Levels identify farm-wide priorities by highlighting areas such as Nutrition or Healthiness that require additional management attention.

Best-Fit Solution

Best-fit Solution

Humic/fulvic acid biostimulant

Prominent: **NUTRITION**

Organic compounds that improve nutrient uptake, soil structure, and microbial activity.

3
Fields

81.31 ha
Area

100
% Farm

Other microbial based biostimulant

Prominent: **NUTRITION**

Includes beneficial microbes like *Pseudomonas*, *Azospirillum*, or *Rhizobium* that are not *Bacillus* or *Trichoderma*, contributing to plant vigor.

3
Fields

81.31 ha
Area

100
% Farm

Products

<i>Pseudomonas putida</i>	in 3 Fields	81.31 ha
<i>Pseudomonas fluorescens</i>	in 3 Fields	81.31 ha

Translates the farm's identified biological needs into actionable recommendations through Biome Makers' recommendation engine. Based on aggregated farm results and correlations with field-trial data, this section recommends the most suitable categories of biological inputs, defines their application scope across the farm, and identifies the principal products or microbial groups associated with each recommendation.

Detailed Farm Analysis

Potential Metrics to Improve

Diseases and biocontrol

Black mold

● Garlic

MAX: **100 BSC - VERY HIGH**

High risk in

29.02 ha

35.69% of total farm

Fusarium bulb rot

● Garlic

MAX: **100 BSC - VERY HIGH**

High risk in

10.55 ha

12.98% of total farm

Fusarium basal rot

● Garlic

MAX: **81 BSC - VERY HIGH**

High risk in

11.66 ha

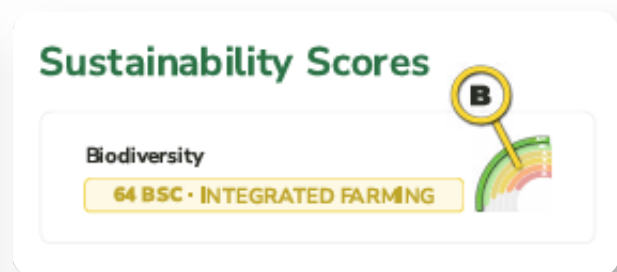
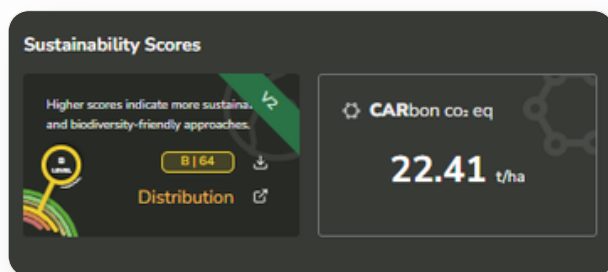
14.34% of total farm

The remaining sections of the report provide a comprehensive evaluation of the farm's biological performance through Potential Metrics to Improve, Global Metrics, Disease Risks, and the complete biological metrics reference. Together, these sections help users investigate specific biological functions, interpret management priorities, and support data-driven agronomic decisions.

Sustainability Scores

The Sustainability Scores module provides a high-level assessment of the farm's ecological performance by summarizing key sustainability indicators derived from the aggregated biological analysis of all fields included in the operation.

Within the BeCrop Farm ecosystem, this information is available in both the BeCrop Farm Report and the BeCrop Farm Digital Platform. While the report provides a concise summary of the farm's sustainability status, the digital platform allows users to interactively explore the same information together with additional visualization tools.



The Sustainability Scores module is composed of two complementary metrics:

- **BIOdiversity**
- **CARbon CO₂ eq**

The following sections describe the purpose, interpretation, and methodology behind each metric.



Understanding the BIOdiversity Metric



This metric serves as a primary indicator of your farm's ecological sustainability. Higher scores are associated with farming systems that utilize more sustainable and biodiversity-friendly management practices.

This metric evaluates the current farming management approach through a comparative analysis of the complex soil microbiome networks present across the agricultural operation.

The BIOdiversity metric is expressed as a **BSC** ranging from **0 to 100**, accompanied by a letter classification from **A++** to **D**. Together, these values provide a standardized benchmark for interpreting the ecological sustainability of the farming system.

Note: The BIOdiversity metric used in BeCrop Farm is different from the Biosustainability score reported in the BeCrop Test report. Although both are based on biological analyses, they represent different indices and should not be interpreted interchangeably.

Interpreting the classification Scale

The BIOdiversity BSC compares your farm's soil microbiome with a large reference database to characterize the overall farming management approach based on its biological profile. This classification provides a practical benchmark for understanding the ecological sustainability of the farming system.

The BIODiversity BSC should be interpreted as a comparative characterization of the biological condition of the farming system rather than as an absolute measure of sustainability.

In general, conventional farming systems tend to be associated with the lower BSC ranges, while regenerative and organic management systems are more commonly associated with higher BSC values. Individual results will always depend on the biological characteristics of each agricultural operation.

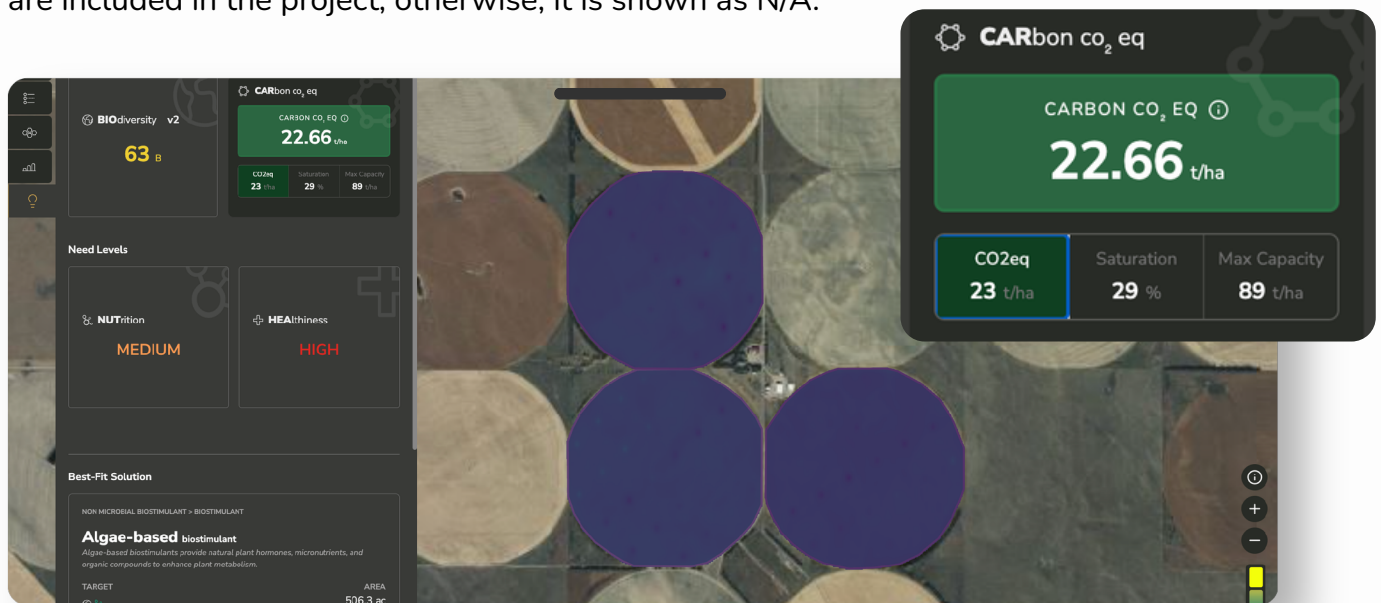
Classification	BSC Score	Description
A++ – Wild Farming	90–100	Highly associated with natural ecosystems, requiring minimal or no human intervention.
A+ – Bio Farming	80–89	Low-input farming systems that emphasize natural processes and minimal human intervention using readily available resources and techniques. Examples include biodynamic farming practices.
A – Balanced Farming	70–79	Farming systems that combine agronomic, biological, and mechanical practices to promote a balanced coexistence between agricultural production and natural ecosystems. Examples include certified organic and ecological farming systems.
B – Integrated Farming	60–69	Farming systems that integrate agronomic, biological, chemical, and mechanical practices to maintain productivity while reducing environmental impact. Regenerative agriculture commonly falls within this range, depending on management practices.
C – Intensive Farming	50–59	Production systems characterized by relatively high levels of external inputs or labor to maximize productivity. Conventional agriculture commonly falls within this range.
D – Harmful Farming	0–49	Production systems with very high management intensity and a high risk of biodiversity and soil fertility loss. These scores are typically associated with soils where biodiversity has been severely degraded.

Understanding the Soil Carbon Sequestration Metrics

The Carbon Metrics provide complementary information to help users understand both the current amount of carbon stored in the soil and the soil's capacity to store additional carbon. Together, these metrics provide context for interpreting soil carbon performance and identifying opportunities for improvement.

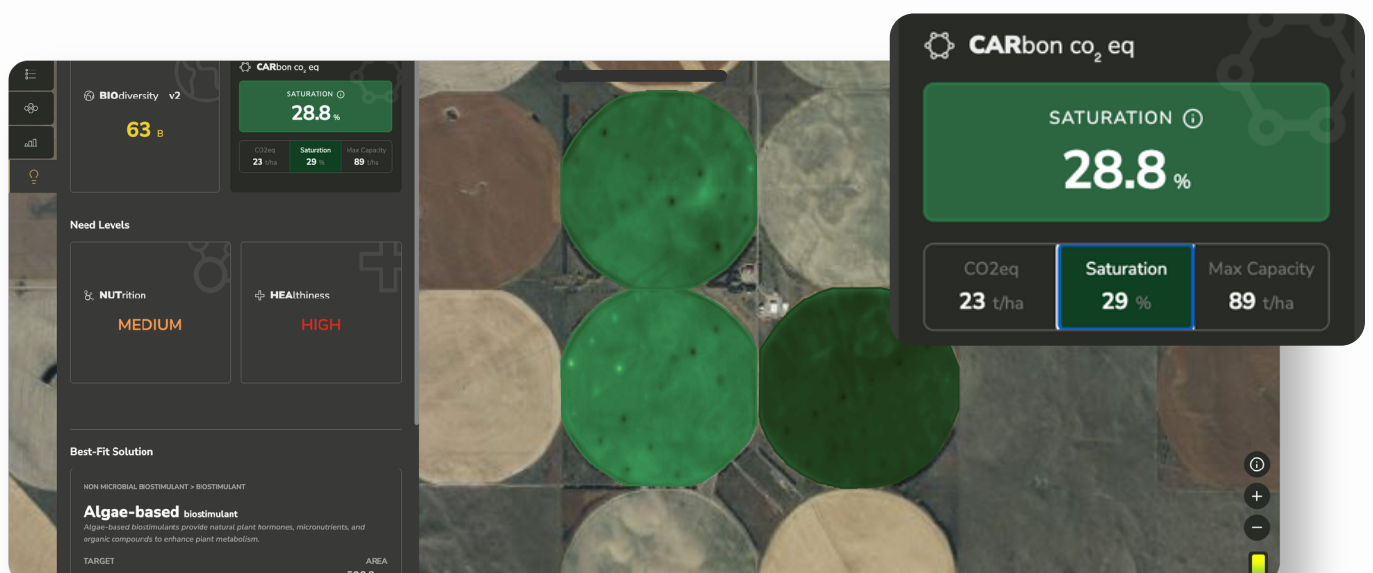
CO₂eq — Soil Carbon Stock (t/ha)

Shows the estimated amount of carbon currently stored in the soil, expressed as tonnes of CO₂ equivalent per hectare (t/ha). This value is available when physicochemical (PhCh) data are included in the project; otherwise, it is shown as N/A.



CO₂eq Saturation (%)

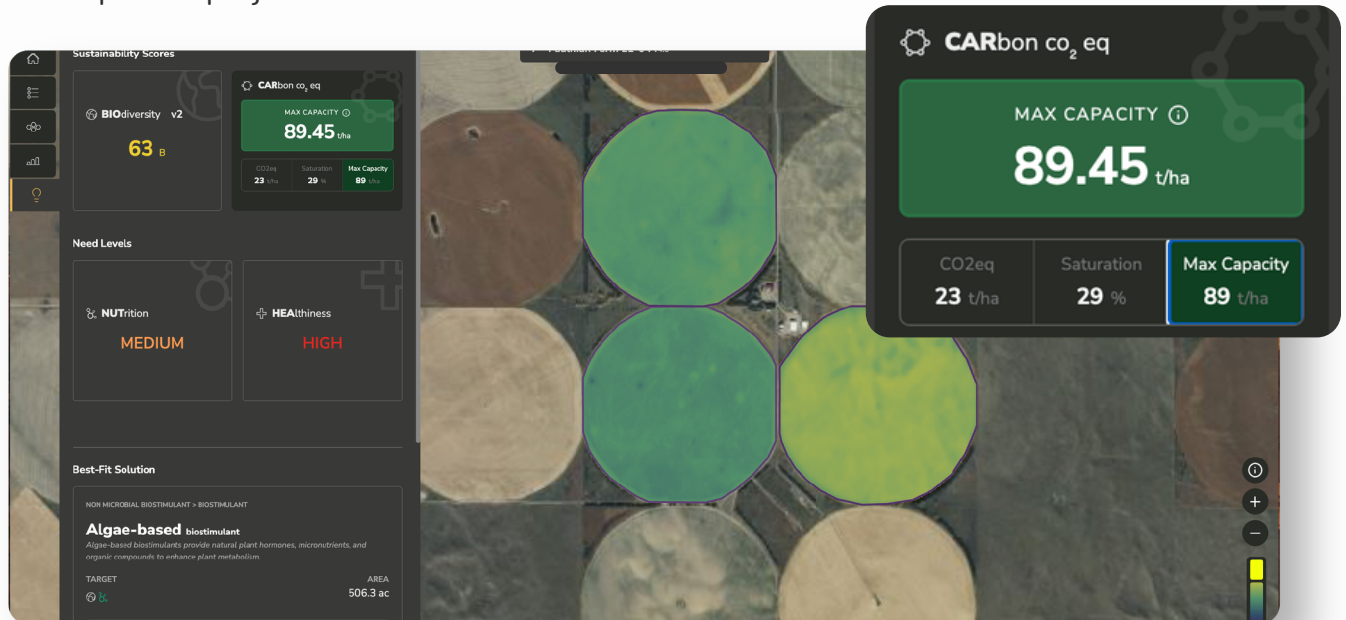
Indicates how close the soil is to its estimated carbon storage capacity by comparing observed CO₂eq with the theoretical storage range. Higher values indicate that the soil is closer to its maximum capacity, while lower values suggest greater potential for additional carbon storage. **Physicochemical data are required to calculate this metric.**



CO₂eq MAX Capacity (t/ha)

Represents the theoretical maximum amount of carbon the soil could store under ideal conditions and optimal agricultural practices.

Unlike CO₂eq, it **does not require physicochemical analyses**, so it is available for all BeCrop Farm projects.



How to interpret them together

These metrics are designed to be used together:

- **CO₂eq** → How much carbon is currently stored?
- **CO₂eq Max Capacity** → How much carbon could this soil potentially store?
- **CO₂eq Saturation** → How close is the soil to that estimated capacity?

Methodology

The Soil Carbon Sequestration metric is calculated using carbon-related physicochemical measurements provided by the associated laboratory analysis. Depending on the laboratory and analytical method, the calculation may use one or more of the following parameters:

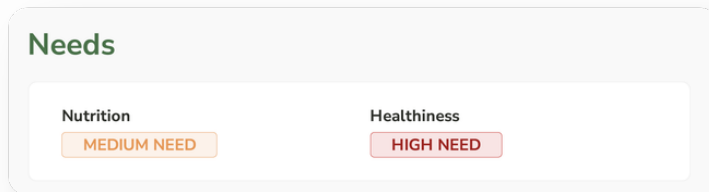
- Total Organic Carbon (TOC)
- Organic Matter (Dry Combustion)
- Organic Matter (Loss on Ignition)
- Total Carbon (HNO₃)
- Total Carbon (Combustion Analysis)

To ensure consistency when comparing agricultural parcels, carbon stock calculations are standardized to a soil depth of **30 cm**.

The methodology is based on internationally recognized scientific frameworks, including the **IPCC (2006) Guidelines** and the **FAO GSOCmap Technical Manual (2017)**.

Need Levels

The **Need Levels** module provides a high-level summary of the biological functions that require the greatest management attention across the agricultural operation. By synthesizing the aggregated biological analysis of all fields, it identifies systemic vulnerabilities and prioritizes the areas with the highest potential for improvement.

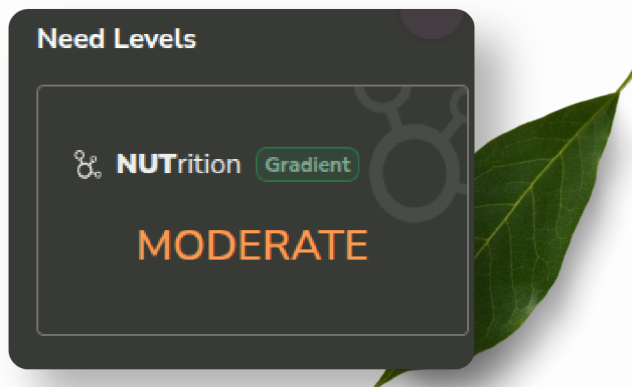


Within both the BeCrop Farm Report and the BeCrop Farm Digital Platform, Need Levels are summarized through two complementary indicators:

Nutrition

The **Nutrition** indicator identifies the overall nutritional needs of the farm by highlighting where microbial nutrient mobilization can be improved. Higher Need Levels indicate greater opportunities to optimize nutrient availability through biological management.

Digital Platform

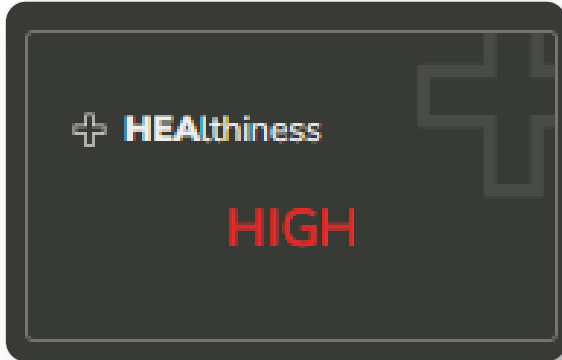


Within the BeCrop Farm Digital Platform, selecting the Nutrition layer displays an interactive gradient map highlighting the areas of the farm with the greatest nutritional need. This map is generated by combining the Global Nitrogen, Global Phosphorus, and Global Potassium indices. For each location (pixel), the displayed value corresponds to the lowest of these three indices, representing the nutrient that constitutes the greatest biological limitation at that point. For example, if a given pixel has Global Nitrogen = 10, Global Phosphorus = 10, and Global Potassium = 5, the resulting value displayed in the Nutrition layer will be 5. This visualization helps users identify where biological management practices aimed at improving nutrient mobilization may have the greatest impact.

Healthiness

The **Healthiness** indicator provides a global assessment of crop health risk by identifying areas with the highest risk from major soil-borne diseases

Digital Platform



Within the BeCrop Farm Digital Platform, selecting the Healthiness layer displays an interactive map built only from the risk maps of the major diseases evaluated for the crop. For each location (pixel), the layer shows the highest risk found among those major diseases. A High risk in any major disease translates into a High need (red); when every major disease sits at Low risk, the layer shows a Low need (yellow). The layer represents the highest major-disease risk present at each point and should not be interpreted as the presence of any specific disease. Minor diseases do not enter this layer. This visualization helps users identify the areas with the greatest pathogen pressure and prioritize further investigation using the individual disease risk maps.

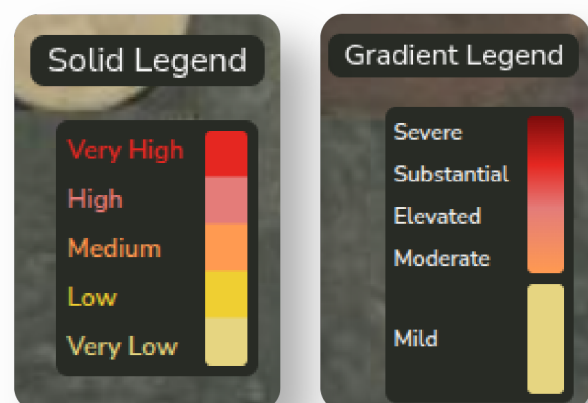
Needs Layer Visualization Scales

Need Maps for Nutrition and Healthiness can be viewed using two different scales.

The Gradient Scale provides a more progressive view of the results and makes it easier to identify the highest and most critical values. It uses Mild, Moderate, Elevated, Intense, and Extreme.

The Classic Scale uses the standard Very Low, Low, Medium, High, and Very High categories used across BeCrop.

Users can **switch between both scales** using the icon above the legend.



Best-Fit Solution

The **Best-Fit Solution** module is the actionable intelligence section of the BeCrop Farm Report. It translates the biological needs identified across the agricultural operation into practical management recommendations, helping users prioritize biological interventions at the farm level.

Recommendations are generated using Biome Makers' machine learning model, which correlates aggregated soil microbiome analyses with agronomic field-trial data to identify the biological input categories with the highest potential to improve the detected needs.



Within the BeCrop Farm Report and the BeCrop Farm Digital Platform, each recommendation is composed of three elements:

Targeted Solution Categories

These recommendations are generated by Biome Makers' machine learning system, which analyzes biological results alongside agronomic field-trial data to identify the biological input categories with the highest potential to address the detected needs.

Best-fit Solution

Humic/fulvic acid biostimulant Prominent: NUTRITION <i>Organic compounds that improve nutrient uptake, soil structure, and microbial activity.</i>	3 Fields	81.31 ha Area	100 % Farm
Other microbial based biostimulant Prominent: NUTRITION <i>Includes beneficial microbes like Pseudomonas, Azospirillum, or Rhizobium that are not Bacillus or Trichoderma, contributing to plant vigor.</i>	3 Fields	81.31 ha Area	100 % Farm
Products			
Pseudomonas putida	in 3 Fields	81.31 ha	
Pseudomonas fluorescens	in 3 Fields	81.31 ha	

Coverage Metrics

For each recommendation, the report indicates the scope of the proposed intervention by displaying:

- **Fields** – The number of fields where the recommendation applies.
- **Area** – The total surface area requiring the recommended intervention.
- **% Farm** – The percentage of the total farm represented by the recommendation.

These values help users understand the scale of the recommended biological management practice across the agricultural operation.

Product Breakdown

Each recommendation outlines the proposed solution's application scope alongside its principal biological products, active compounds, or microbial taxa to support product evaluation and management planning.



Digital Platform

The BeCrop Farm Digital Platform presents the primary recommended solution together with additional "Other options to consider," allowing users to explore alternative biological input categories that may also address the identified needs.

Each recommendation includes a Targets Guide that evaluates the expected biological impact across the biological functions monitored by BeCrop Farm. Standardized icons (such as BIO for Biodiversity and NUT for Nutrition) identify the targeted functions, while a simple color-coding system indicates the expected outcome: green represents a positive expected impact, whereas grey indicates that no significant improvement is expected for that biological function.

Other options to consider:

Option	Area
Humic/fulvic acid biostimulant	506.3 ac
MICROBIAL BIOSTIMULANT > BIOSTIMULANT	
Other microbial based biostimulant Includes beneficial microbes like <i>Pseudomonas</i> , <i>Azospirillum</i> , or <i>Rhizobium</i> that are not <i>Bacillus</i> or <i>Trichoderma</i> , contributing to plant vigor.	
TARGET	AREA
	374.63 ac
<i>Pseudomonas fluorescens</i>	374.63 ac
<i>Pseudomonas putida</i>	374.63 ac
Trichoderma	261.32 ac

**** Targets Guide**

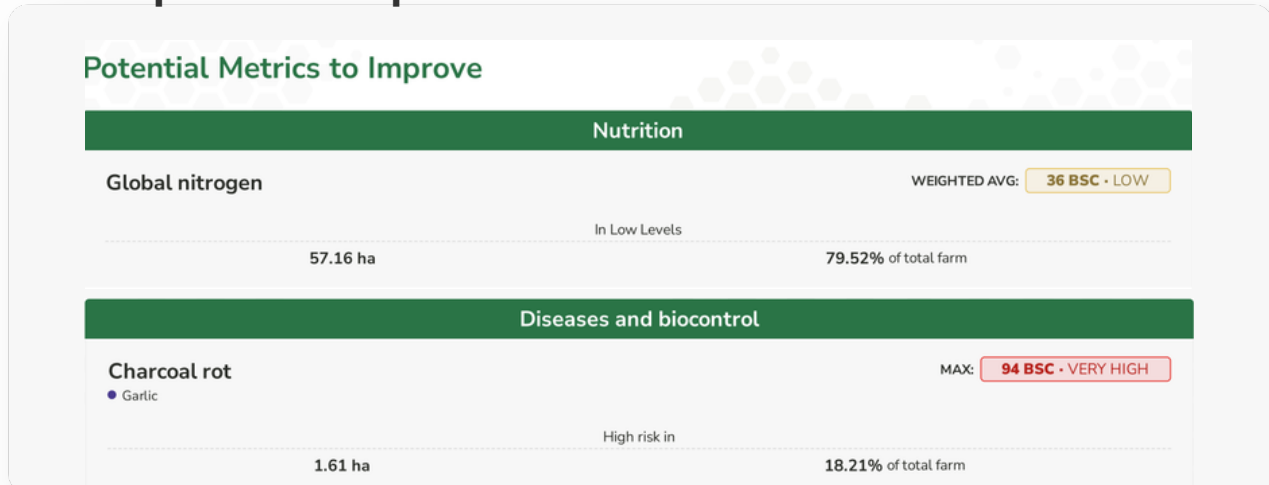
The target possibilities always follow the same order and its position is

Potential Metrics to Improve

The **Potential Metrics to Improve** section acts as a targeted diagnostic tool, highlighting the biological functions with the greatest opportunity for improvement across the farm. It helps users identify which biological functions are underperforming and understand the scale of the opportunity across the operation.

This information is available in both the BeCrop Farm Report and the BeCrop Farm Digital Platform.

BeCrop Farm Report



Within the report, metrics are grouped according to their biological category (such as Nutrition or Diseases and Biocontrol) and summarized using:

- BeCrop Scores (BSC)** – All biological metrics are expressed using the BeCrop Score (BSC), a standardized 0–100 scale. Each metric is benchmarked against Biome Makers’ reference database, enabling consistent interpretation of biological performance across the report.

- Weighted Average (W.AVG)** – Presents a size-weighted aggregate of field results, providing a global farm value expressed in BSC units.

- Rank Classification** – Very Low, Low, Medium, High, Very High.

For Regular metrics – Represents the quintile where the farm is located regarding the crop reference

For Disease metrics – Represents a severity classification as the maximum level of risk detected across the farm

- Maximum risk (MAX)** – Presents the maximum value of disease risk detected in the field/farm. Although it may be present in a very small extension or as a single portion of a field, we report the highest values due to the risk of the disease spreading.

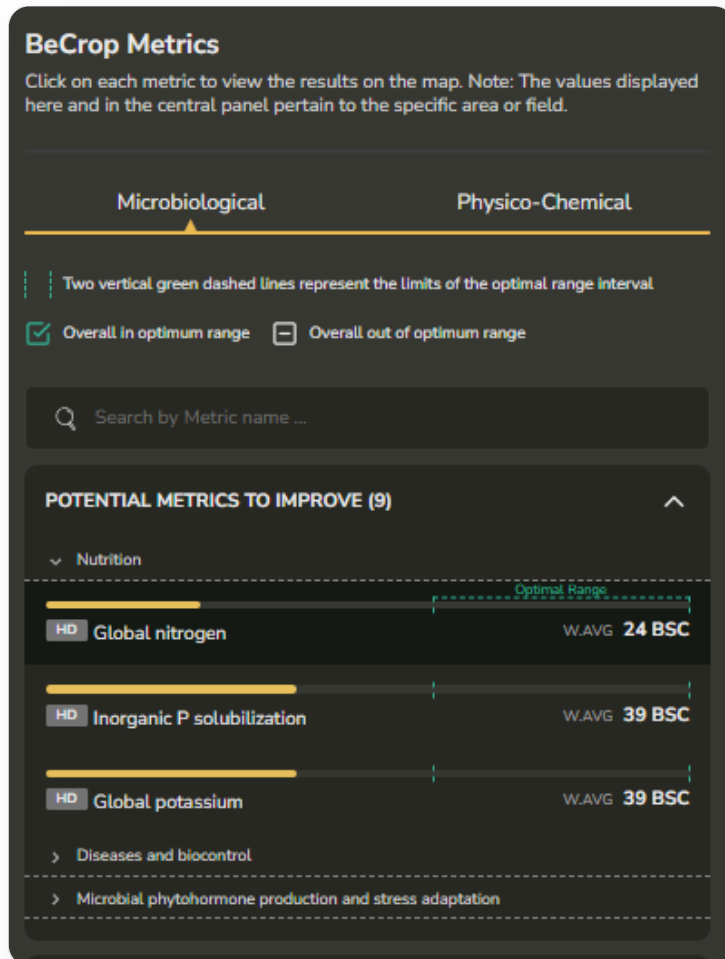
- Area in Low Levels** – The total surface area where the metric is below the desired biological level.

- % Farm** – The percentage of the agricultural operation represented by the identified opportunity.

Together, these values allow users to quickly assess both the severity and the physical extent of each biological opportunity.

BeCrop Farm Digital Platform

The Digital Platform expands this analysis by allowing users to explore each metric interactively.



Key features include:

- **Microbiological and Physico-Chemical tabs** for filtering biological and physicochemical metrics.
- **Interactive metric categories**, allowing users to expand and explore individual functional groups.
- **Optimal Range visualization**, where two vertical green dashed lines indicate the expected biological range for each metric.
- **Status indicators**, showing whether the farm average is currently within or outside the optimal range.
- **Interactive search**, allowing users to quickly locate individual biological metrics.

Together, these tools help users investigate biological opportunities in greater detail and prioritize management decisions across the farm.

Global Metrics

The **Global Metrics** section provides a comprehensive, farm-wide evaluation of the principal biological functions within the agricultural operation. While the previous sections identify the biological functions that require the greatest management attention, the Global Metrics provide a complete baseline of the farm's overall biological performance across the major agronomic categories.

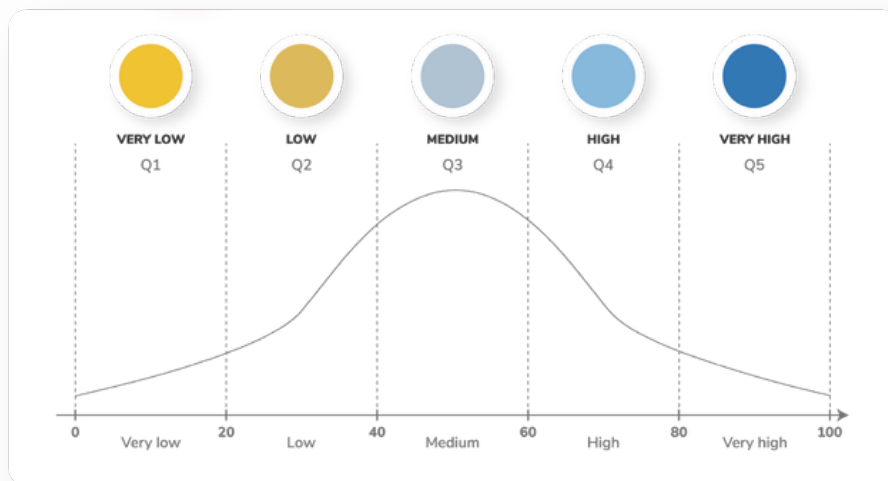
This information is presented differently in the BeCrop Farm Digital Platform and the BeCrop Farm Report, allowing users to both explore the data interactively and interpret it within an agronomic context.

BeCrop Farm Digital Platform



Each card displays:

- The aggregated **BSC score**.
- A qualitative classification (such as **Very Low, Low, Medium, High, or Very High**).
- A status indicator showing whether the metric is currently within or outside the optimal biological range.



Within the BeCrop Farm Digital Platform, the **Overall Status** panel summarizes the farm's biological performance through individual Global Indices. Each Global Index is a standalone index of a biological function (carbon, nitrogen, healthiness, biocontrol...). It is computed from the same underlying microbial components as the individual indicators of that function, but it is not a sum or an average of them: an individual indicator can move without moving the global, and vice versa. The farm value shown is the area-weighted average of the index across the analyzed fields.



These include:

- Global Carbon
- Global Nitrogen
- Global Phosphorus
- Global Potassium
- Global Healthiness
- Global Biocontrol
- Global Microbial Phytohormone Production
- Global Stress Adaptation

Global Carbon



Carbon is the basis of biological soil fertility. It is the main compound in organic matter and an essential source of food for beneficial soil microbes. The presence of organic carbon improves soil health and fertility, increasing crop yields and reducing soil degradation. A low value indicates potential for carbon loss from the soil, while high values indicate potential for carbon sequestration.

Gain 

CARBON FIXATION

The conversion process of inorganic carbon to organic compounds by living microorganisms.

ORGANIC COMPOUNDS DEGRADATION

The process in which soil microorganisms decompose vegetal debris, releasing diverse mineral nutrients. It is related to soil humification.

Loss 

AEROBIC RESPIRATION

The process in which microbes use organic compounds in oxygenated conditions, releasing CO₂.

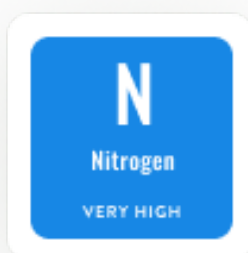
FERMENTATION

The process in which cells gain energy from organic compounds in non-oxygenated conditions, releasing CO₂.

METHANOGENESIS

The formation of methane (CH₄) by microbes, contributing to the degradation of organic matter. Typically in anoxic conditions.

Global Nitrogen



Nitrogen is a major component of plant DNA, proteins, and chlorophyll, playing a fundamental role in crop yield. The mineralization of organic to inorganic nitrogen, fixation of atmospheric nitrogen, and process of nitrification by microorganisms supplies N in readily available forms (nitrate and ammonia) for plants. Low values indicate low nitrogen mobilization potential by microbes.

Gain **NITROGEN FROM GAS**

Nitrogen fixation, or the microbial transformation of atmospheric nitrogen into forms that plants and soil microbes can use.

NITROGEN TO AMMONIA

Nitrogen mineralization, or the microbial transformation of organic nitrogen into inorganic forms (ammonia).

NITROGEN TO NITRATE

Nitrification, or the microbial conversion of intermediate nitrogen forms to nitrate that plants can use.

Loss **NITROGEN TO GAS**

Denitrification, or the microbial conversion of nitrate into nitrogen gas that is lost to the atmosphere.

UREA BY VOLATILIZATION

Nitrogen volatilization, or the microbial conversion of urea to nitrogen gas that is lost to the atmosphere.

NITROGEN TO BIOMASS

Immobilization, or the microbial conversion of inorganic nitrogen compounds to organic forms in microbial biomass.

Global Phosphorus



Phosphorus is a fundamental nutrient required in the regulation of protein synthesis and plant growth. It enhances the development of roots, while its deficiency leads to stunted growth, dark purple color of leaves, and inhibition of flowering. Low values indicate that the microbial processes that make phosphorus available for plants are low.

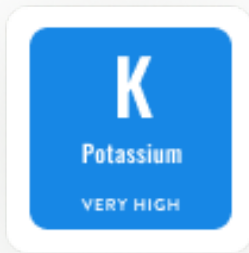
Nutrient Supply **INORGANIC PHOSPHORUS SOLUBILIZATION**

Certain soil microorganisms are capable of dissolving insoluble phosphorus from minerals and rocks. They convert insoluble phosphorus in the soil into a form that plants can access, improving their growth and yield. Major portions of conventional phosphorus fertilizers applied to fields end up locked in this insoluble form, so higher levels of phosphorus solubilizing microbes can improve phosphorus fertilizer use efficiency.

Nutrient Competition **INORGANIC PHOSPHORUS CONSUMPTION**

Both plants and microbes require phosphorus to support their metabolic functions. High values indicate high competition/immobilization of phosphorus by soil microbes.

Global Potassium



Potassium is a regulator of metabolic activities, especially those involved in producing proteins and sugars and regulating crop evapotranspiration. When bioavailable potassium is deficient it causes leaf curl and sensitivity to droughts. Low values indicate that the microbial processes that make potassium available for plants are low.

Nutrient Supply

POTASSIUM EXPORT

Certain soil microorganisms export potassium ions from inside their cells to the surrounding environment, making them more available for plant uptake, improving their growth and yields.

Nutrient Competition

POTASSIUM CONSUMPTION

Both plants and microbes require potassium for their functioning. High values indicate a high potential for microbes to compete with the plant by assimilating this nutrient.

Minor Nutrients

Elements with less influence on the crop's nutritional status yet still serve important roles in plant growth and development.



IRON (Iron Mobilization)

Iron is abundant in most soils but is often present in forms that are not readily available to plants. This metric evaluates microbial functions associated with iron mobilization and assimilation. Medium to high values indicate a sufficient microbial potential to support iron availability.



CALCIUM (Calcium Transport)

Calcium plays an important role in nutrient assimilation, soil structure, and plant development. This metric evaluates microbial functions associated with calcium transport. Higher values indicate a greater microbial potential to support calcium movement and soil stability.

**ZINC (Zinc Transport Equilibrium)**

Zinc is an essential micronutrient involved in enzyme activity, protein synthesis, and hormone production. This metric evaluates microbial functions associated with zinc transport and balance. Medium to high values indicate a sufficient microbial potential to support zinc availability.

**COPPER (Copper Export)**

Copper is an essential micronutrient involved in plant metabolism and enzyme activity. This metric evaluates microbial functions associated with copper transport and export. Very high values may indicate conditions associated with excess copper in the soil.

**MANGANESE (Manganese Transport Equilibrium)**

Manganese plays important roles in photosynthesis, respiration, and nitrogen metabolism. This metric evaluates microbial functions related to manganese transport and balance within the soil ecosystem. Medium values are generally considered optimal.

**MAGNESIUM (Magnesium Transport)**

Magnesium is a key component of chlorophyll and is essential for photosynthesis and nutrient transport. This metric evaluates microbial functions associated with magnesium transport and availability. Higher values are generally favorable.

**SULFUR (Sulfur Cycle Equilibrium)**

Sulfur is required for protein synthesis and plant metabolism. This metric evaluates microbial functions involved in sulfur cycling and transformation. Medium to high values indicate a balanced sulfur cycle.

**CHLORINE (Chlorine Transport)**

Chlorine contributes to several physiological processes, including water regulation and stress tolerance. This metric evaluates microbial functions related to chlorine transport. Medium to high values generally indicate balanced microbial activity.



Global Healthiness

Evaluates crop health according to the major diseases detected, combining pathogen load with the biocontrol ecology of the soil. Higher is better: a Very High value means no major disease was detected at a relevant risk level, while a Very Low value means one or more major diseases were detected with a strong presence. Do not confuse this index with the Healthiness need level: the index summarizes the health status, the need level flags where management attention is required.

Global Biocontrol

Microbial species are grouped here according to the type of pest or pathogen they can suppress. The four considered groups are fungicides, bactericides, insecticides, and nematicides. These values do not indicate presence of residues in the soil, but of naturally-occurring organisms that help suppress pests or pathogens.

Biocontrol agents could be predatory, parasitoids of pathogens species, or competing for the same ecological niche with them. Based on their level detected, the presence of biocontrol agents indicates potential for natural control of pests and pathogens by beneficial soil microbes. So soils with high-very high values in these biocontrol indexes may not need to rely on heavy applications of plant protection products to control pest or pathogen impacts.



Global Phytohormone Production

Phytohormone producers: microbial species grouped according to their potential to produce phytohormones. Phytohormones are organic compounds synthesized not only by plants, but also by soil microorganisms as part of their interaction with the plant and surrounding ecosystem.

The Phytohormone Production metric evaluates the microbiome's potential to synthesize plant growth-promoting phytohormones. These compounds, even at low concentrations, can influence plant development, root growth, nutrient uptake, and overall crop performance.

We evaluate three main groups of phytohormone-related microbial functions in the report: **Auxins (IAA)**, **Cytokinins (CK)**, and **Gibberellins (GA)**. When interpreting these results, it is important to consider the crop's phenological stage, as the relevance of each hormone varies throughout plant development. A low value is not necessarily detrimental and should always be interpreted within the agronomic context of the crop.

AUXIN PRODUCTION (IAA)

Responsible for cell division and elongation.



GIBBERELLIN PRODUCTION (GA)

Responsible for elongation, germination, and flowering.

CYTOKININ PRODUCTION (CK)

Responsible for cell proliferation and cell differentiation.

Stress management mechanisms play important roles in plant growth as they improve the general health status and development of plants. The presence of microorganisms with the ability to produce these stress adaptive substances will improve plant development and crop yield.



Global Stress Adaptation

Adaptation to stress conditions: Microbial species grouped according to their ability to produce metabolites that help plants withstand stress conditions. The seven considered mechanisms are ACC (1-aminocyclopropane-1-carboxylate) deaminase production, exopolysaccharide production, heavy metal resistance, salt tolerance, siderophore production, salicylic acid, and abscisic acid.

Metabolite	Functions	
Exopolysaccharide production	Nutrient trap	Salinity protection
Heavy Metal Resistance	Bioremediation	Detoxification
Salt Tolerance	Alleviate Water Stress	Root Growth
Siderophore Production	Iron Nutrition	Biofertilization
ACC deaminase (ACC-D)	Pathogen Protection	Drought Protection
Salicylic Acid (SA)	Alleviate Water Stress	Salinity protection
Absciscic Acid (ABA)	Growth Regulation	Plant Resistance



Stress management mechanisms play important roles in plant growth as they improve the general health status and development of plants. The presence of microorganisms with the ability to produce these stress adaptive substances will improve plant development and crop yield.

For further analysis, the **ALL METRICS** panel provides access to every evaluated biological metric. Metrics are organized into expandable functional categories, including:

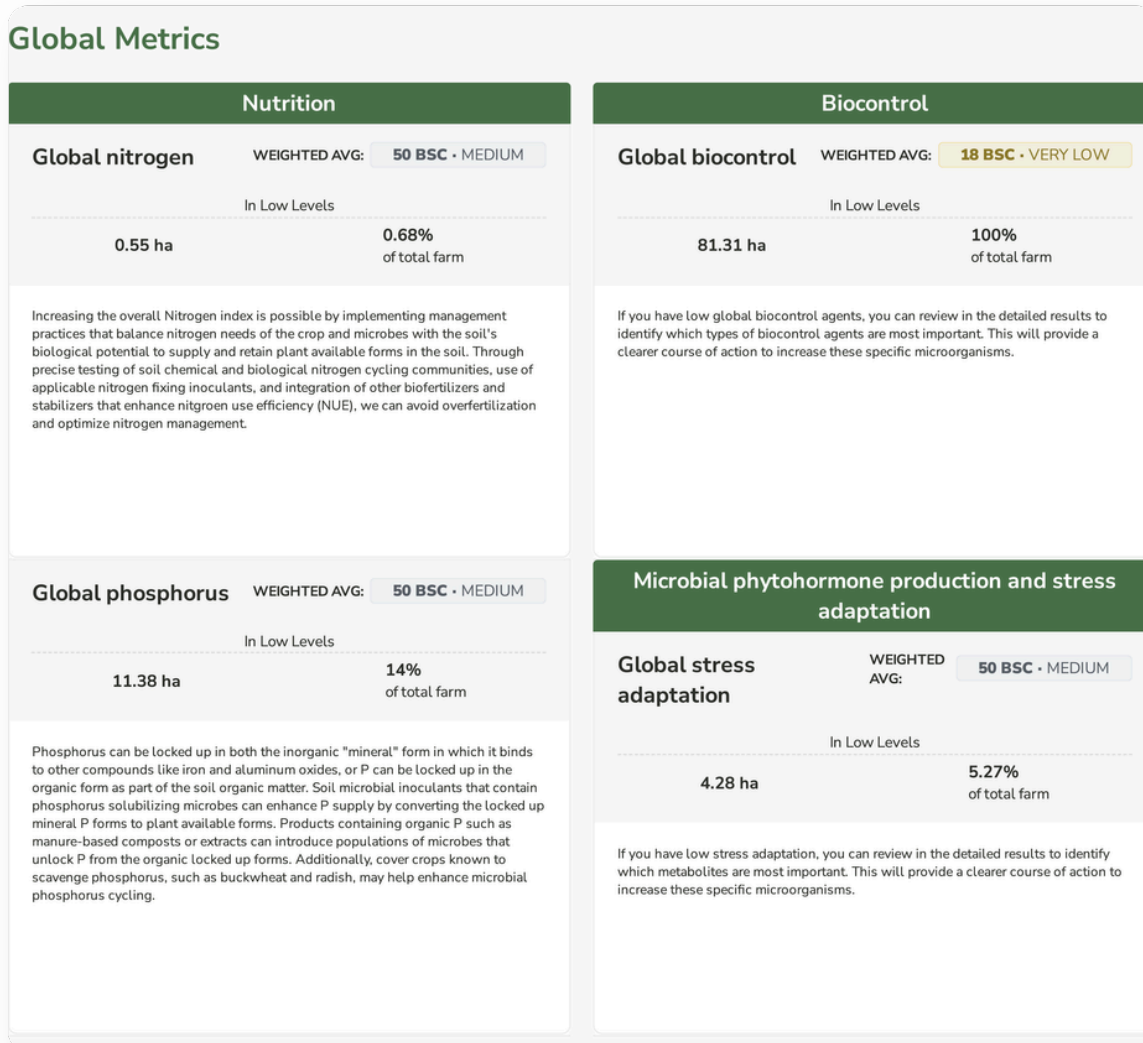
- Carbon Pathways
- Diseases and Biocontrol
- Global Indices
- Phytohormone Production
- Nutrition
- Stress Adaptation

Selecting an individual metric updates the interactive map and displays the corresponding aggregated value for the selected area, allowing users to investigate biological performance throughout the farm.



BeCrop Farm Report

The BeCrop Farm Report presents the same Global Metrics in a print-ready format focused on biological interpretation and agronomic decision-making.



Metrics are grouped according to their primary biological function, such as **Nutrition**, **Biocontrol**, and **Phytohormone Production and Stress Adaptation**.

For each Global Metric, the report provides:

- **Weighted Average (W.AVG)** expressed in BSC units.
- The corresponding biological classification.
- The total area identified **In Low Levels**.
- The percentage of the farm affected.

Unlike the Digital Platform, the report also includes agronomic interpretation beneath each metric, providing biological context and management considerations associated with the observed result. This guidance helps bridge the gap between biological data and practical field management, supporting more informed agronomic decision-making.

Disease Risks

The **Disease Risks** section provides a targeted evaluation of potential soil-borne pathogenic threats across the agricultural operation. Because pathogen profiles vary depending on the cultivated crop, the diseases included in this section are automatically adapted to match the primary crop analyzed within the farm.

This information is presented differently in the BeCrop Farm Report and the BeCrop Farm Digital Platform, allowing users to both identify priority disease risks and further investigate their spatial distribution.

BeCrop Farm Report

The report presents a summary table listing the principal diseases evaluated for the selected crop and quantifies their potential impact across the agricultural operation. To help prioritize management decisions, the table focuses exclusively on **High** and **Very High** disease risk levels.

Diseases Risks		
Disease risks are broken down by crop. High and very high risk insights are displayed on the right.		
Garlic		
Risk	Area	%Farm
Black mold	29.02 ha	35.69
Pink root	20.2 ha	24.84
Fusarium basal rot	11.66 ha	14.34
Fusarium bulb rot	10.55 ha	12.98
Pythium seed rot and damping-off	8.6 ha	10.58
Fusarium damping-off	8.33 ha	10.25
Embellisia skin blotch and bulb canker of garlic	6.69 ha	8.23
Stemphylium leaf blight and stalk rot	4.72 ha	5.8
Rhizoctonia seed rot and seedling disease	4.33 ha	5.32
Charcoal rot	2.72 ha	3.34

** High-risk values indicate how many fields (and their corresponding area and percentage of the total farm) show the disease at high or very high risk levels. A value of 0 ac, 0 ha or 0% DOES NOT MEAN that no disease risk was found, but rather that the risk does not reach high or very high levels

For each disease, the report provides:

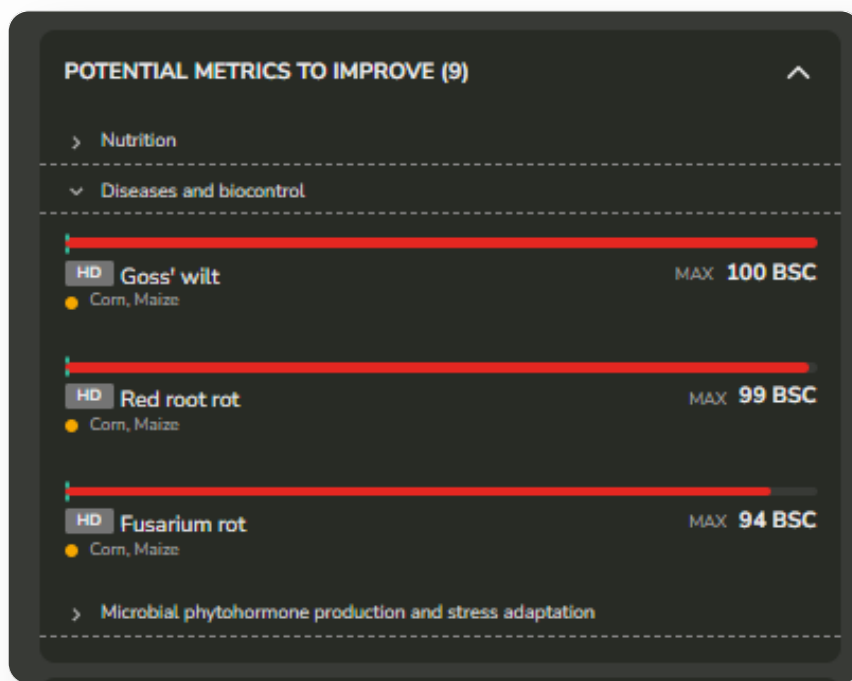
- **Area** – The total surface area (e.g., hectares) currently classified as High or Very High risk.
- **% Farm** – The percentage of the agricultural operation represented by the identified High or Very High risk area.

Together, these values allow users to rapidly evaluate the physical extent of each potential disease risk across the farm.

Important: A reported value of **0 ha** or **0%** does **not** indicate that the pathogen is absent. It simply means that the detected biological risk does not currently reach the **High** or **Very High** risk thresholds.

BeCrop Farm Digital Platform

The **Diseases and Biocontrol** section of the BeCrop Farm Digital Platform allows users to explore disease risks interactively and investigate the spatial distribution of individual pathogens across the agricultural operation.

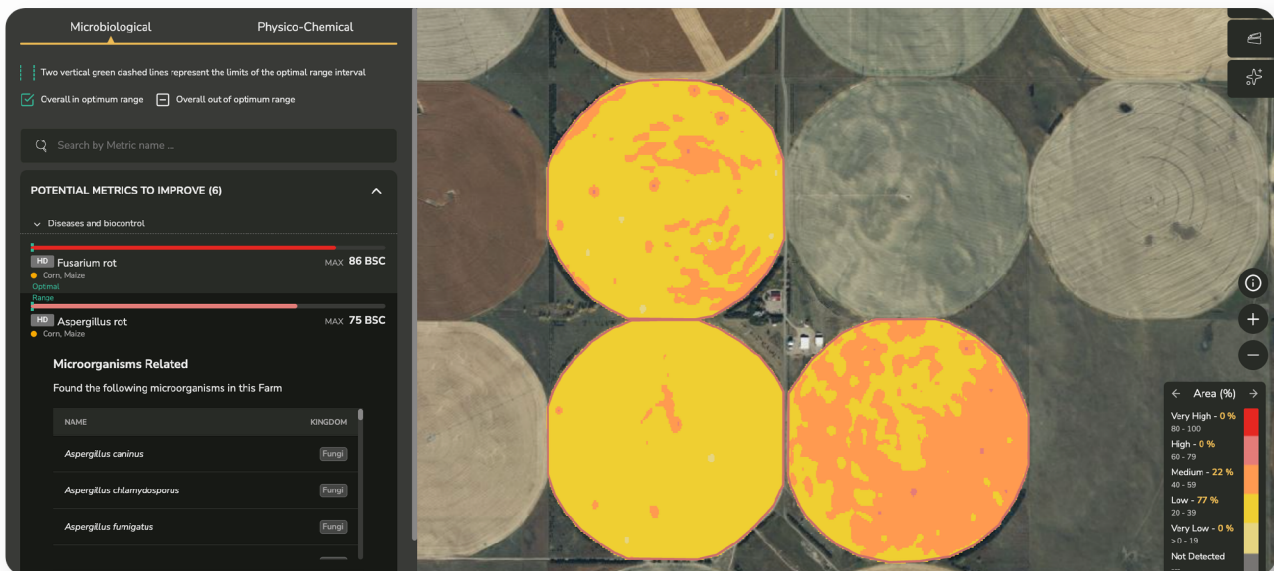


Disease Risk Interpretation

Pathogenic diseases are displayed using the **Maximum (MAX)** BSC score detected within the selected area.

This approach ensures that localized areas with elevated pathogen pressure are not masked by farm-wide averages, allowing users to identify and prioritize the highest-risk locations.

Conversely, beneficial biological functions, such as **Bactericide Agents**, **Fungicide Agents**, and other biocontrol metrics, are displayed using the **Weighted Average (W.AVG)** across the agricultural operation, providing an overall assessment of the farm's biological capacity to naturally suppress pathogens.



Interactive Spatial Mapping

Each disease and biocontrol metric is displayed using a color-coded horizontal indicator representing its biological status.

Selecting an individual disease or biocontrol metric immediately updates the interactive map, allowing users to visualize the spatial distribution of pathogen pressure or beneficial biological activity across the farm and identify the areas where management interventions may be required.

BeCrop Farm Field Report

Highlights

The BeCrop Field Report provides a biological assessment of an individual field, allowing users to evaluate soil functionality and identify management opportunities at the parcel level. While the BeCrop Farm Report presents an aggregated view of the entire operation, the Field Report focuses exclusively on the selected field.

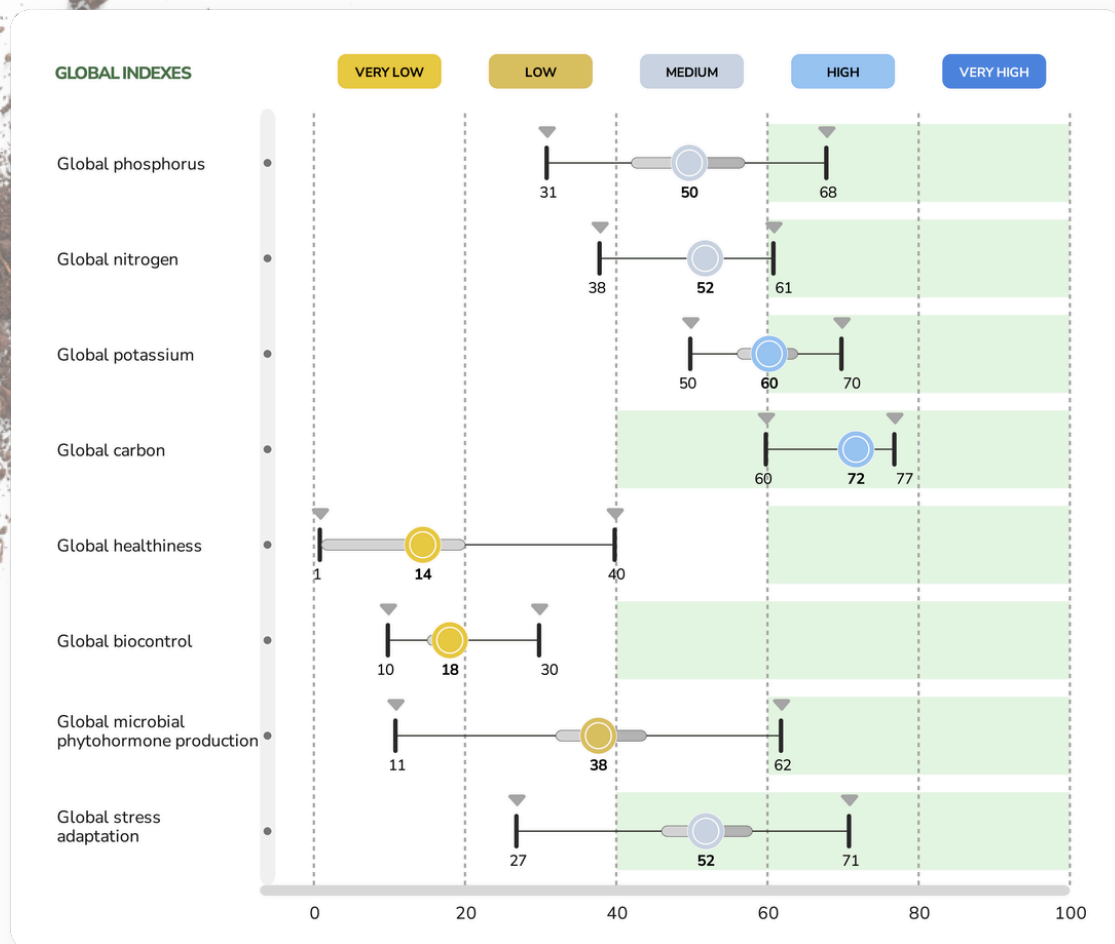
The report follows the same overall structure as the BeCrop Farm Report. Sustainability Scores, Needs, Best-Fit Solution, Potential Metrics to Improve, Global Metrics, and Disease Risks are interpreted using the same methodology and scoring system. The difference is that all values shown in the Field Report correspond only to the selected field rather than an aggregation of multiple fields.



Unlike the BeCrop Farm Report, the detailed metric sections include graphical visualizations that illustrate how each biological metric is distributed within the field. These visualizations provide additional context by showing the variability of the biological performance across the sampled area rather than presenting only a single aggregated value.

Understanding the Metric Visualization

The detailed metric pages of the BeCrop Field Report include a graphical representation designed to help interpret the distribution of each biological metric within the selected field. Each visualization contains the following elements:



- **Average Value** – Represents the overall biological score calculated for the field.
- **Minimum and Maximum Values** – Indicate the lowest and highest values detected across the field, illustrating the range of biological variability.
- **Distribution Bar** – Shows how the metric is distributed throughout the field rather than displaying only the average value.
- **Optimal Range** – The green highlighted area represents the expected optimal range for the metric. Values within this interval indicate optimal biological performance, while values outside the range may represent opportunities for improvement.

BeCrop+ Physicochemical Analysis

BeCrop+ complements the biological information provided by BeCrop by integrating physicochemical soil analyses performed by specialized third-party soil laboratories. This combined approach allows users to evaluate both the biological functionality and the physicochemical properties of their soils within a single reporting ecosystem.

The integrated physicochemical information is available in both the BeCrop Reports and the BeCrop Digital Platform, providing a more comprehensive view of soil health and supporting more informed agronomic decision-making.

The specific physicochemical parameters included in a BeCrop+ project may vary depending on the laboratory, analytical methodology, and analytical package selected for the project. As a result, the metrics displayed in your report and digital platform may differ between projects.

Depending on the laboratory and analytical package selected, the physicochemical section may include measurements such as:

- Soil organic matter (OM)
- Organic carbon (OC)
- pH
- Nutrient concentrations
- Cation exchange capacity (CEC)
- Electrical conductivity (EC)
- Soil texture

Additional laboratory-specific parameters

The biological and physicochemical results are presented together to provide complementary insights into soil health, helping users better understand the relationship between soil chemistry, biology, and overall agronomic performance.

For the interpretation of individual physicochemical parameters, analytical methodologies, and laboratory-specific reference ranges, please refer to the documentation provided by the corresponding analytical laboratory.



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