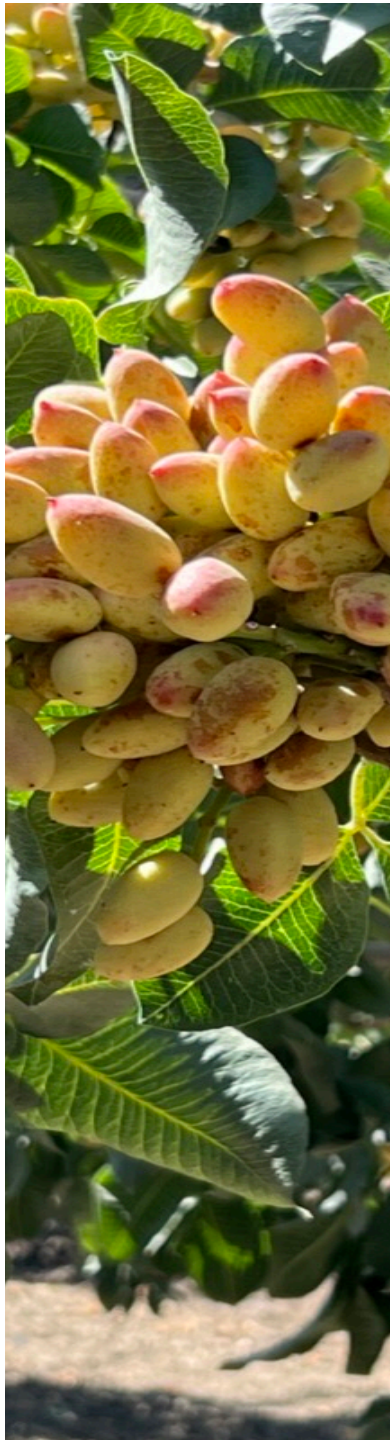
BeCrop Test
Microbial Changes

Pistachios (2022 – 2023)
Carbonic Acid treated water

The BeCrop Score reflects how each sample compares to the Biome Makers soil sample database. Higher scores are indicative of higher levels of microbial functionality



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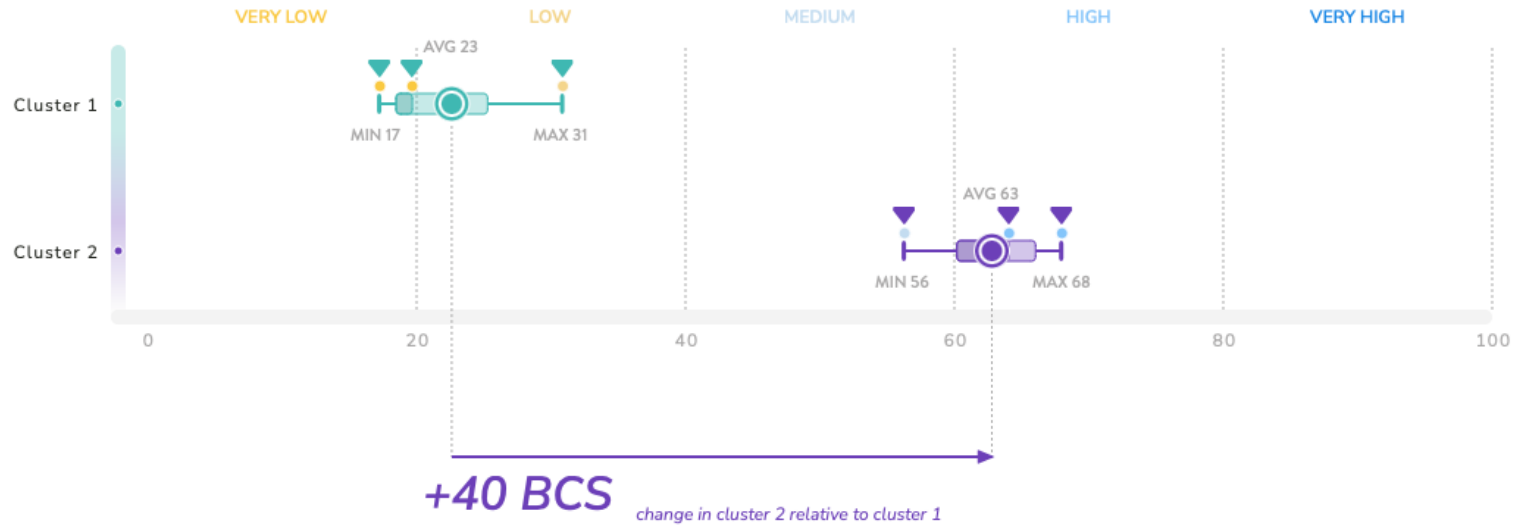
BIOMEMAKERS
POWERED BY BECROP

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.

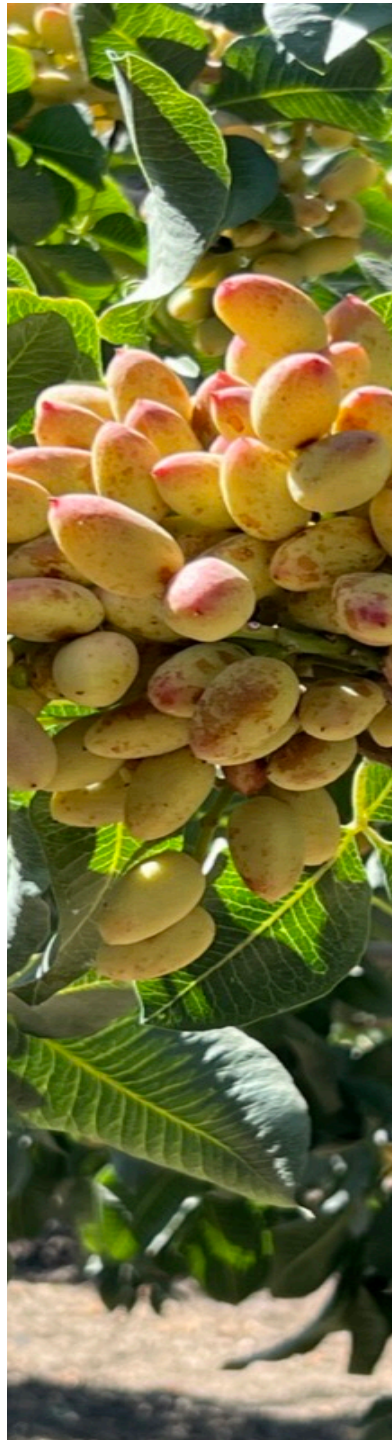
CARBON FIXATION

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



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MICROBIAL CHANGES

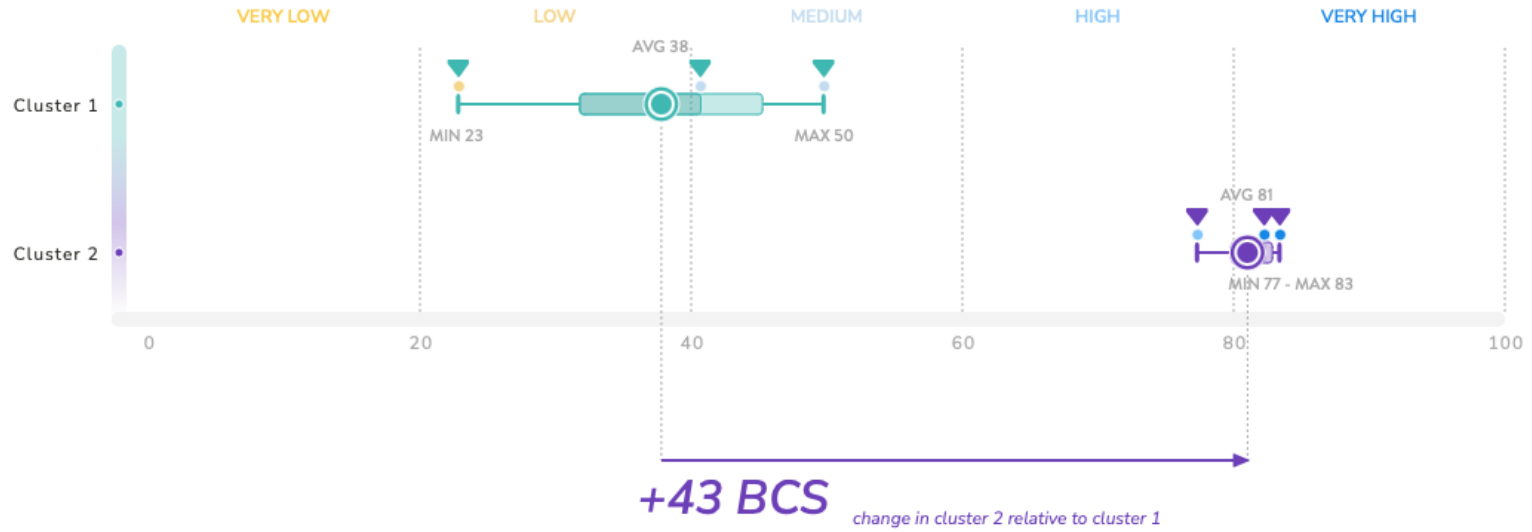


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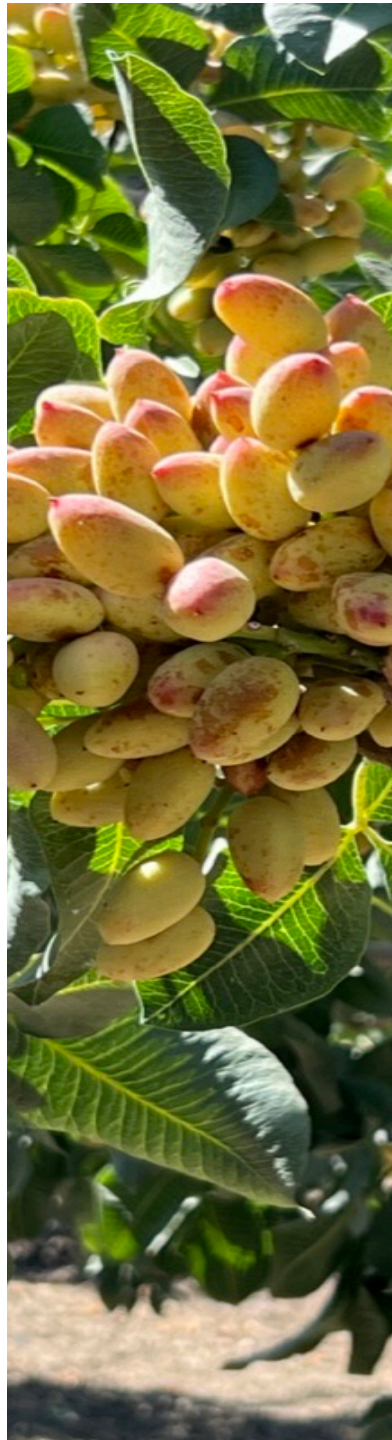
AEROBIC RESPIRATION

The process in which microbes use organic compounds in oxygenated conditions, releasing CO_2



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MICROBIAL CHANGES

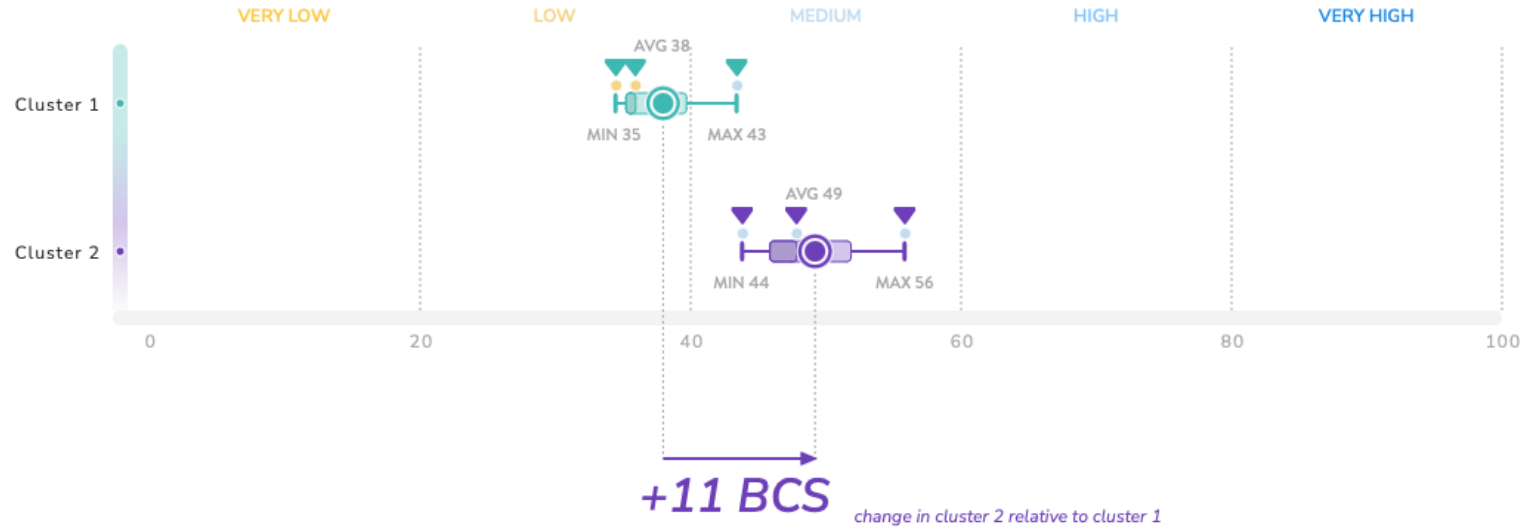


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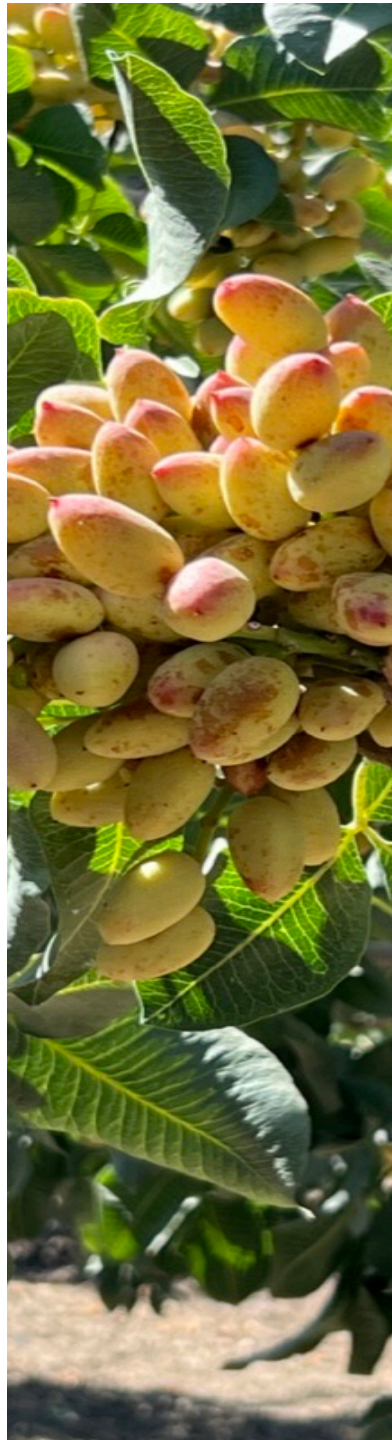
FERMENTATION

The process in which cells gain energy from organic compounds in non-oxygenated conditions, releasing CO_2



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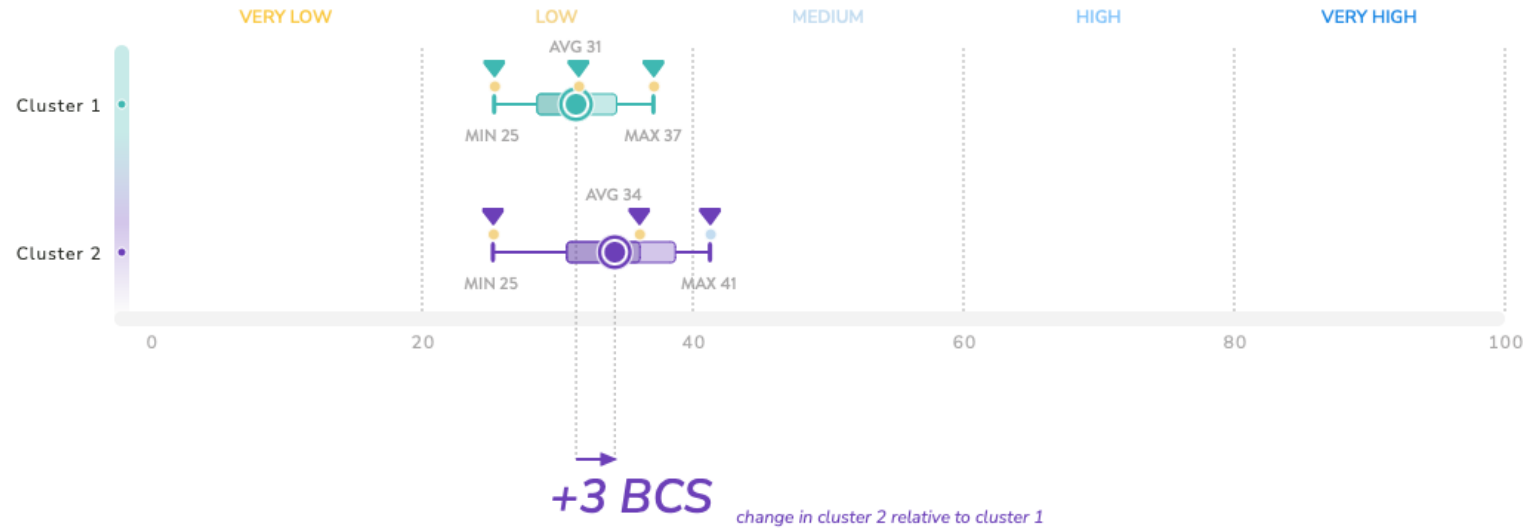


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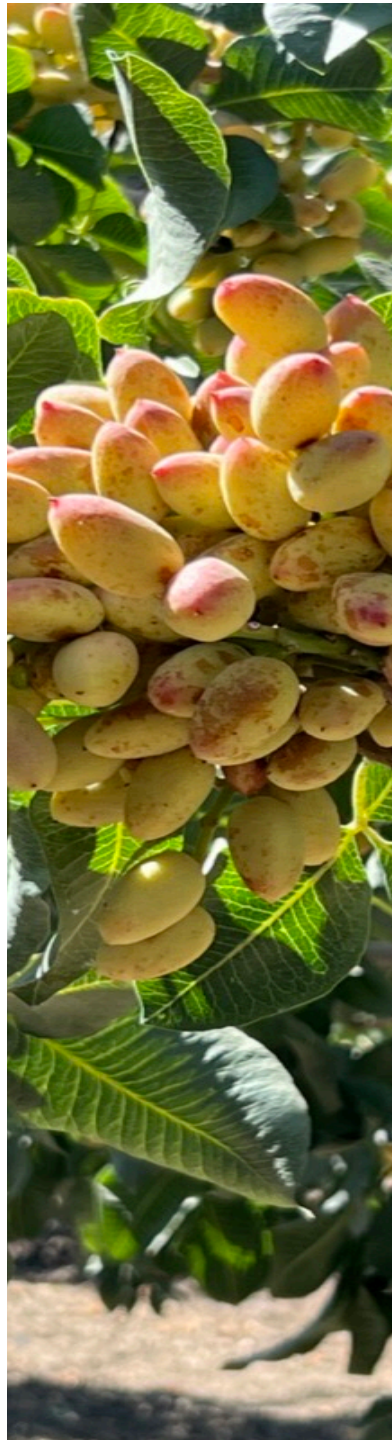
METHANOGENESIS

The formation of methane (CH_4) by microbes, contributing to the degradation of organic matter.



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MICROBIAL CHANGES



CARBON

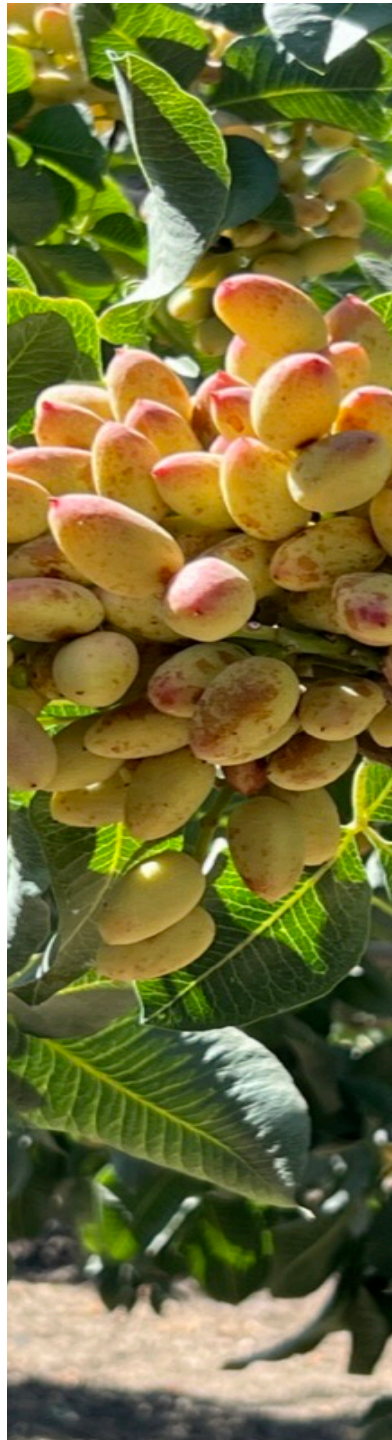
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ORGANIC MATTER RELEASE

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



MICROBIAL CHANGES

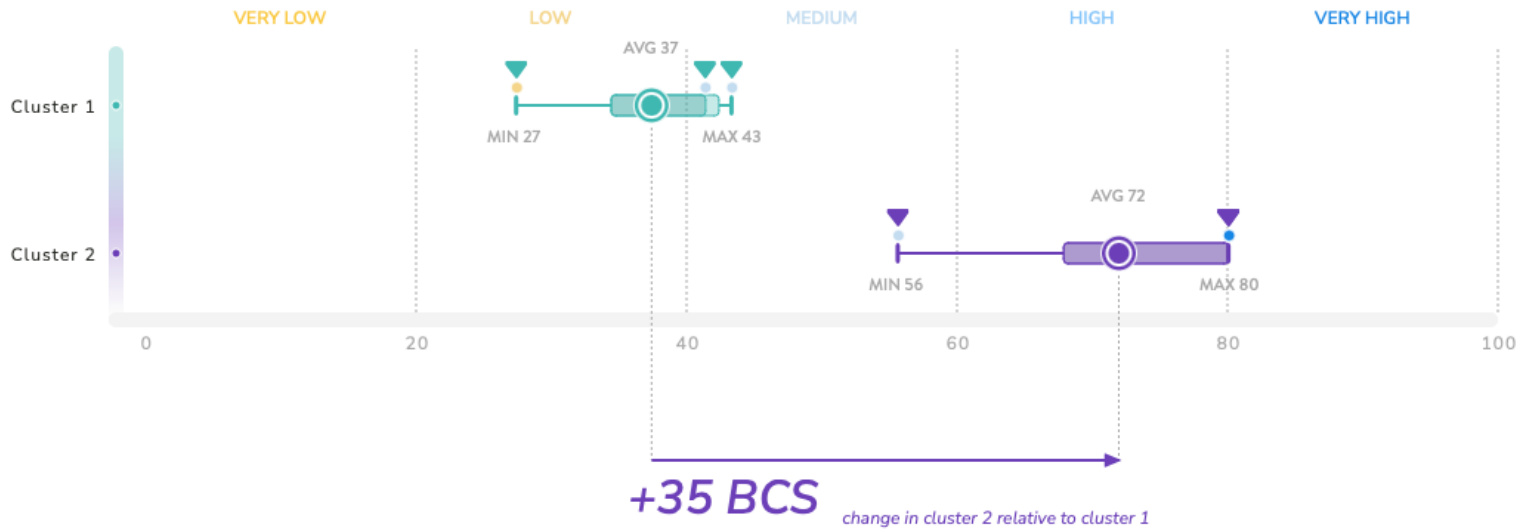


NITROGEN PATHWAYS

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 by microorganisms supplies N in readily available forms (nitrate and ammonia) for plants. LOW values indicate low nitrogen mobilization potential by microbes.

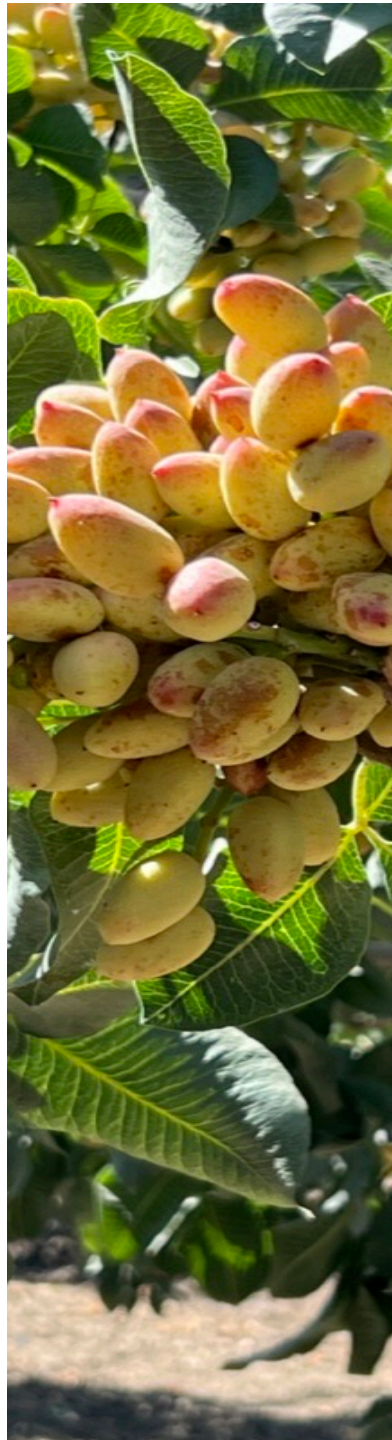
INORGANIC NITROGEN RELEASE

Mineralization, or the microbial transformation of organic nitrogen compounds to inorganic nitrogen compounds that serve as plant Nutrients



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MICROBIAL CHANGES



NITROGEN PATHWAYS

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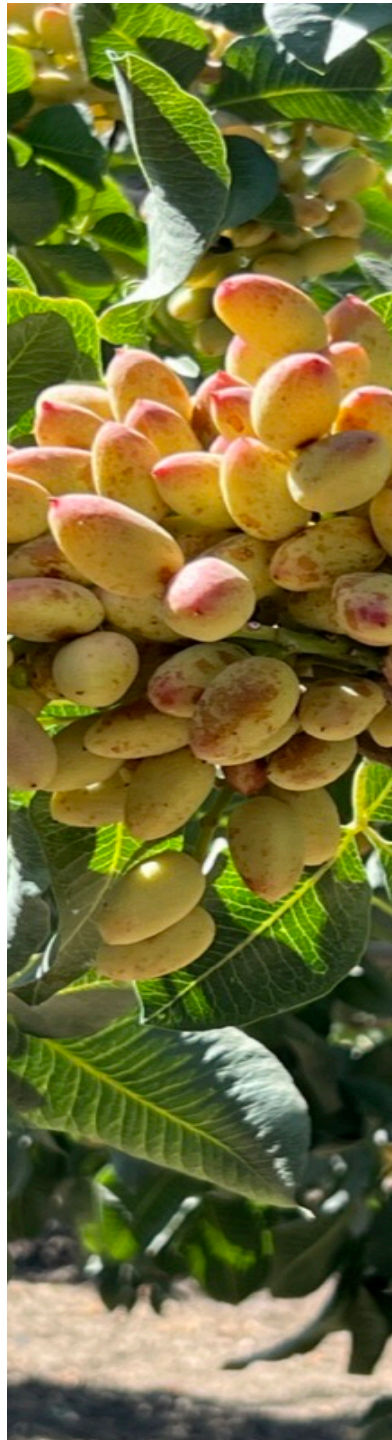
INORGANIC NITROGEN CONSUMPTION

Inorganic nitrogen consumption: immobilization, or the microbial transformation of inorganic nitrogen compounds to organic forms, which are not readily accessible for uptake by plants.



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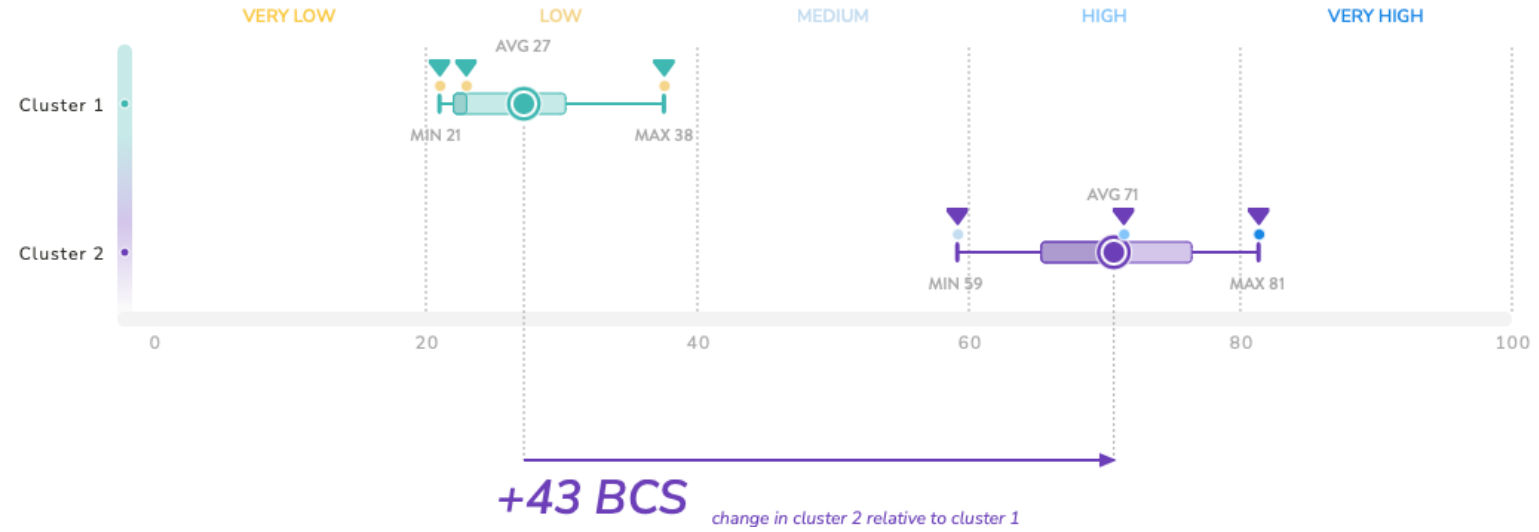


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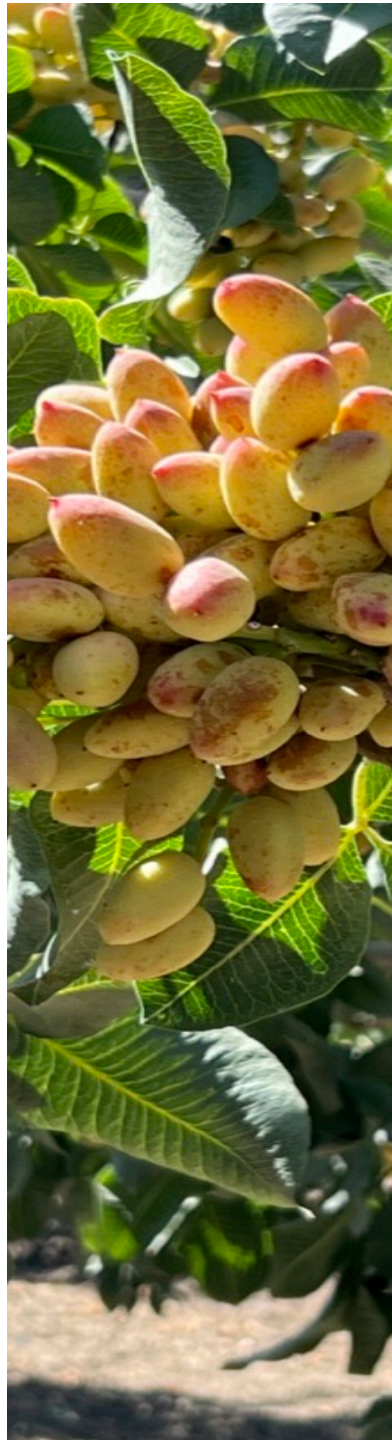
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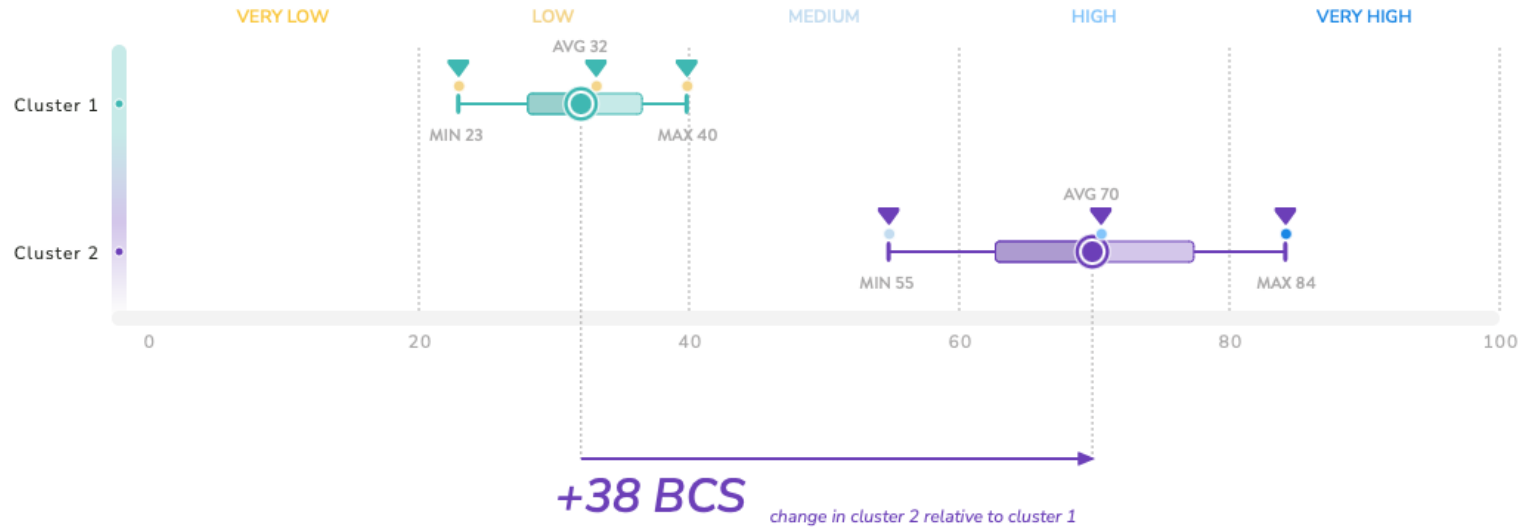


PHOSPHORUS PATHWAYS

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.

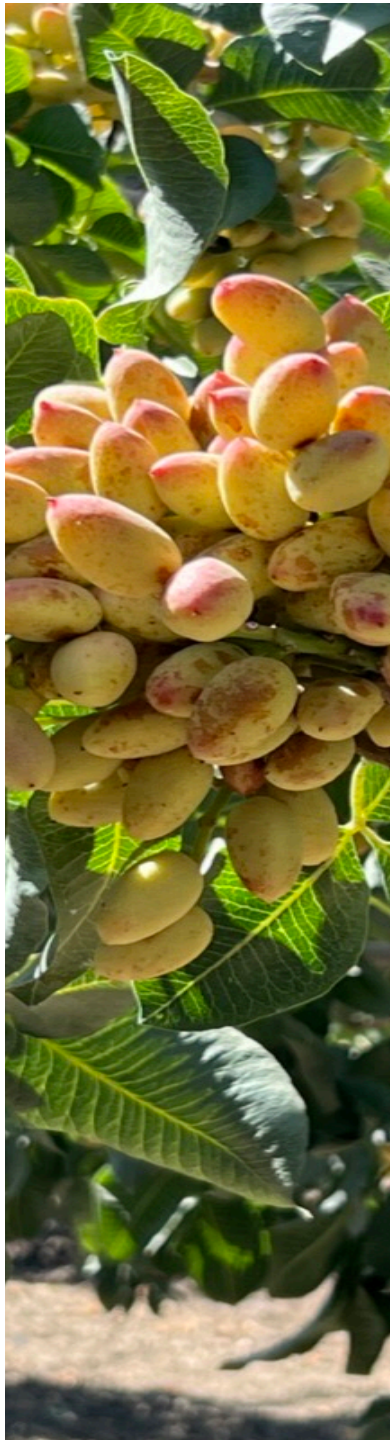
INORGANIC PHOSPHORUS SOLUBILIZATION

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.



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MICROBIAL CHANGES



PHOSPHORUS PATHWAYS

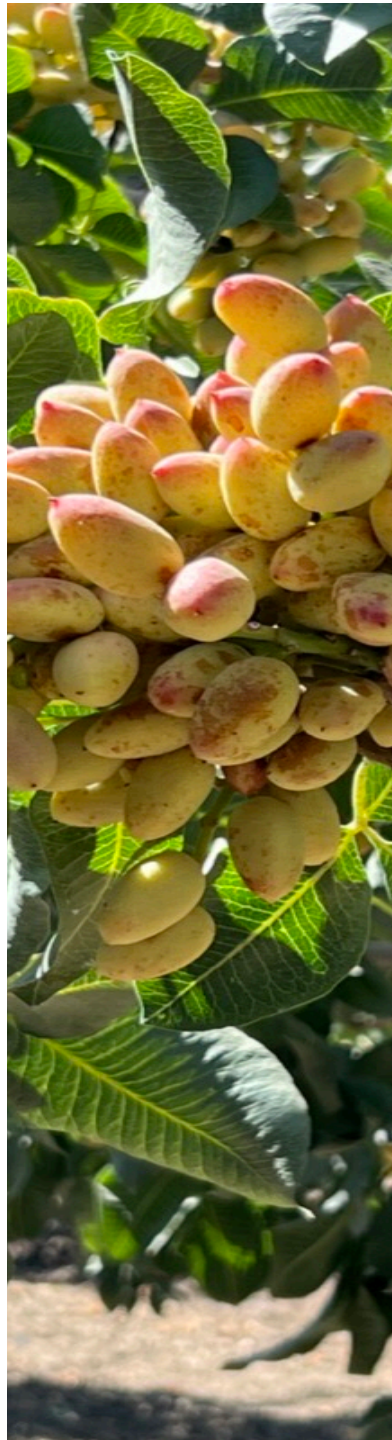
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INORGANIC PHOSPHORUS CONSUMPTION

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



MICROBIAL CHANGES

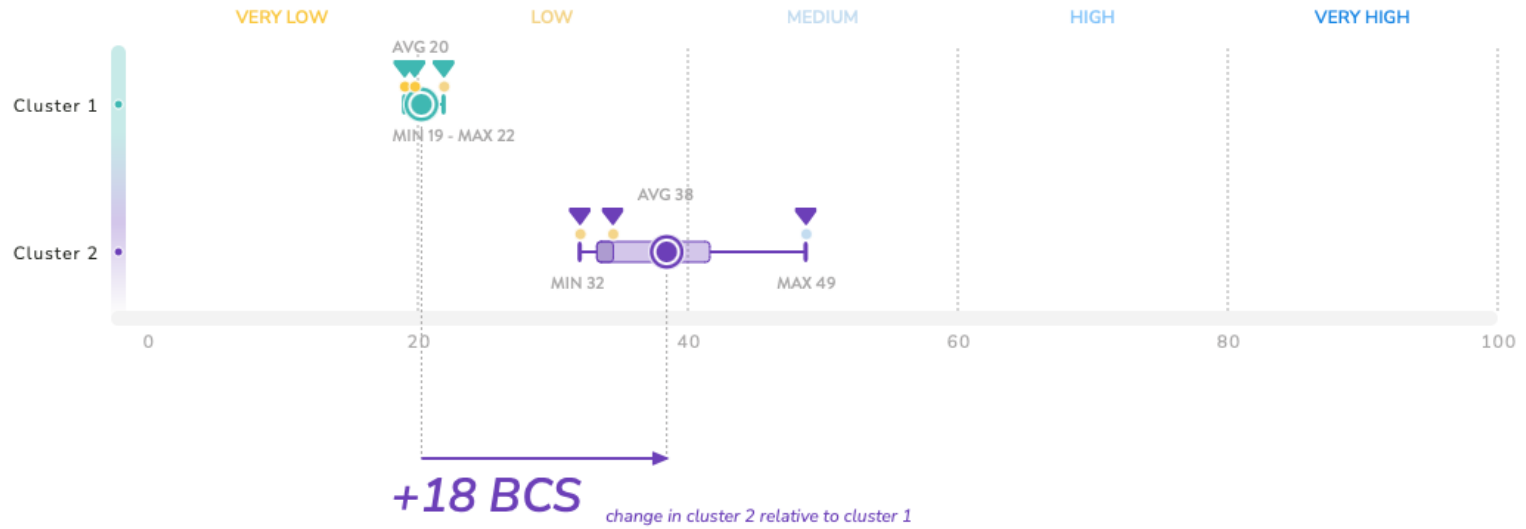


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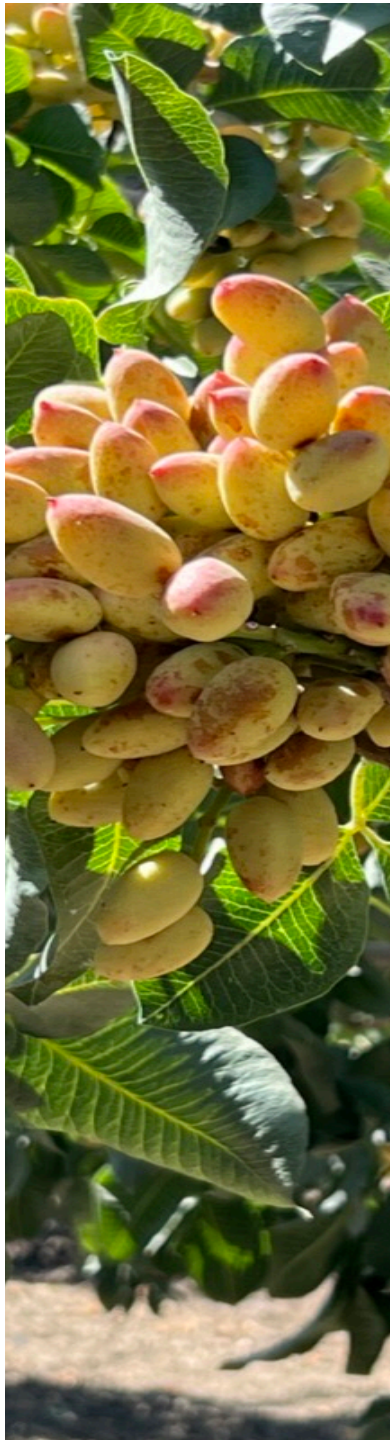
INORGANIC PHOSPHORUS ASSIMILATION

Organic phosphorus may represent from 15% to 80% of the total content of this element in the soil. During the phosphorus mineralization process assessed by this index, organic phosphorus is converted by microbes from the organic form that is not readily available to the plant, to inorganic forms that can be more easily up taken by the plant.



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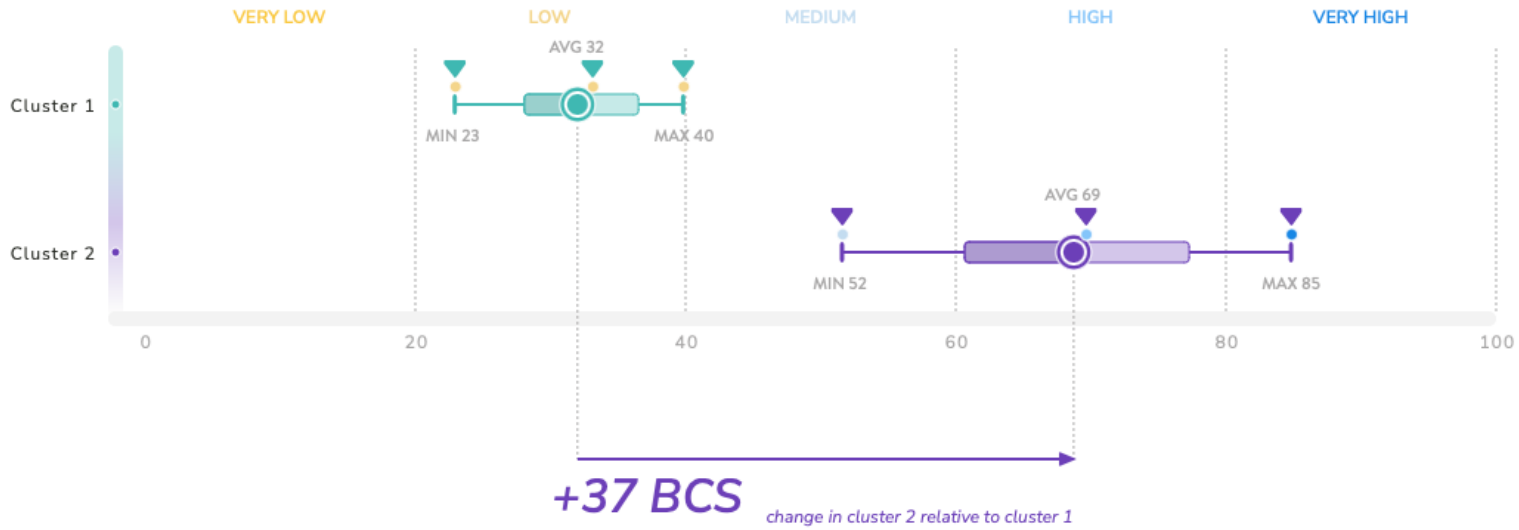


POTASSIUM PATHWAYS

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.

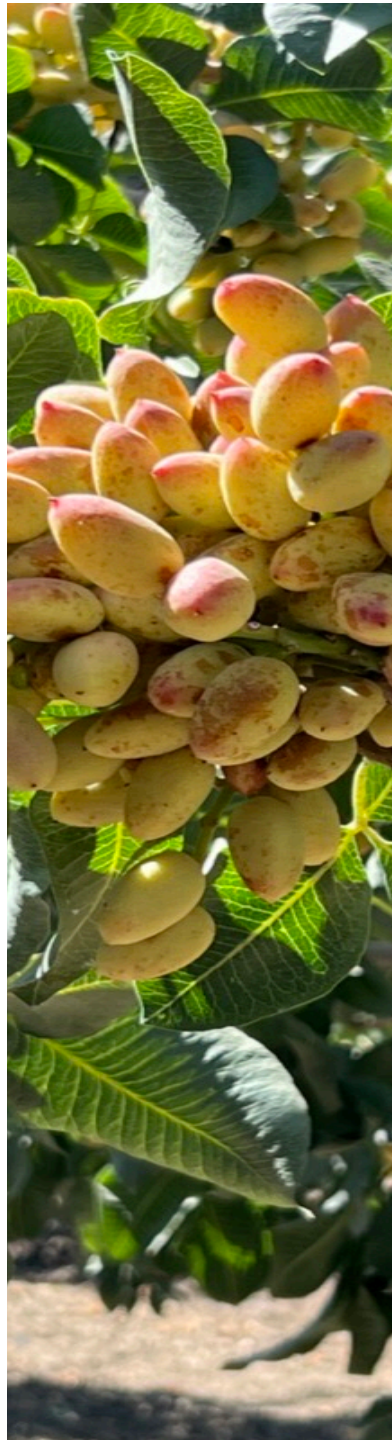
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MICROBIAL CHANGES

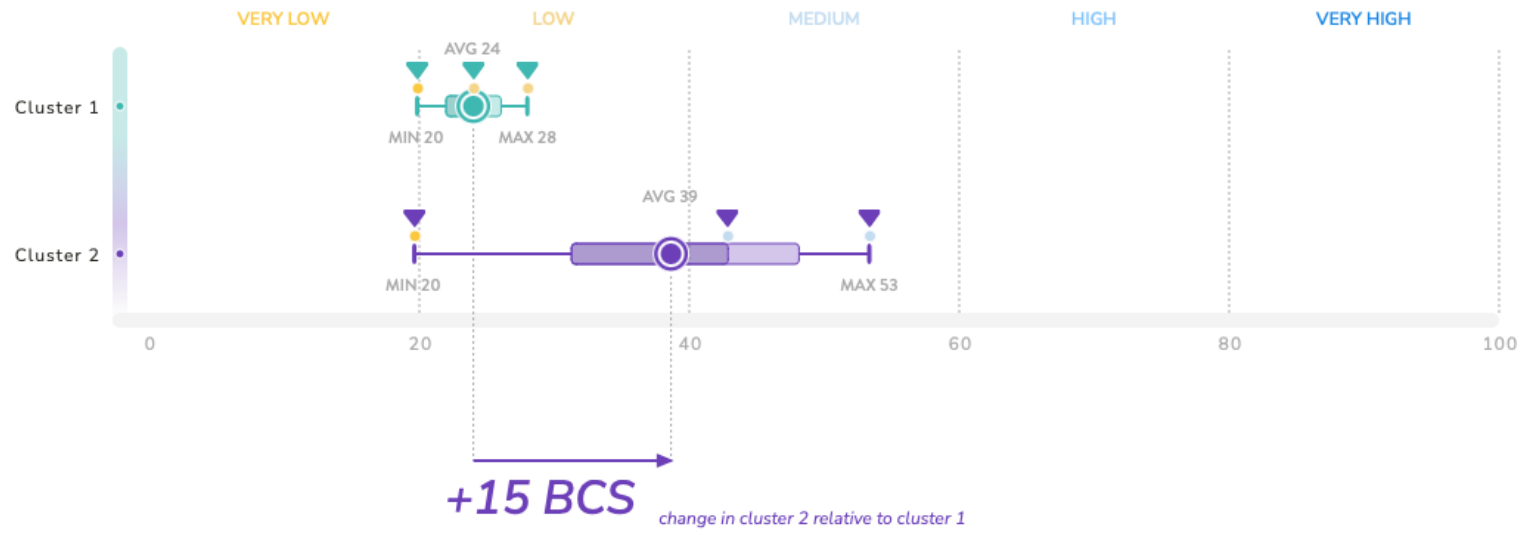


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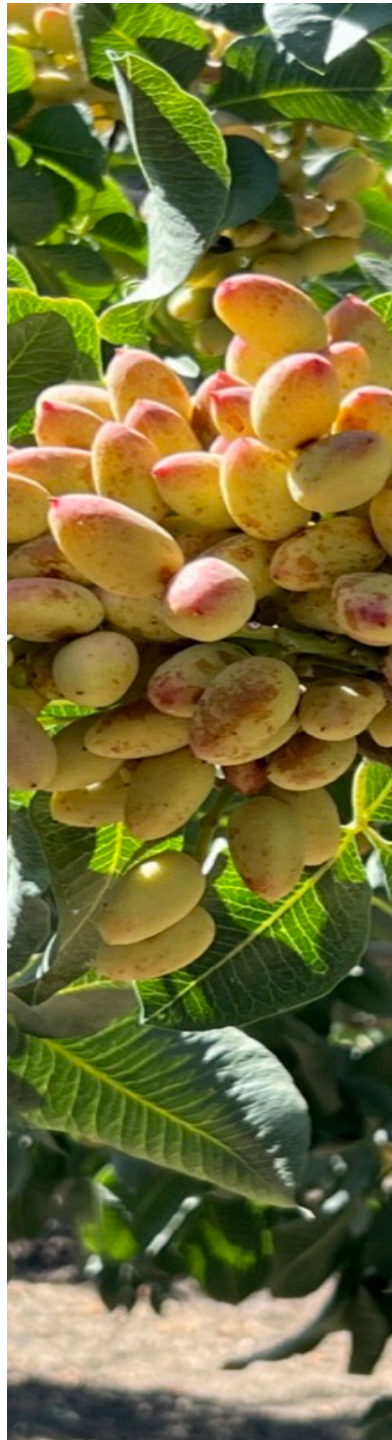
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Both plants and microbes require potassium for their functioning. High values indicate a high potential for microbes to compete with the plant by assimilating this nutrient.



MICROBIAL CHANGES

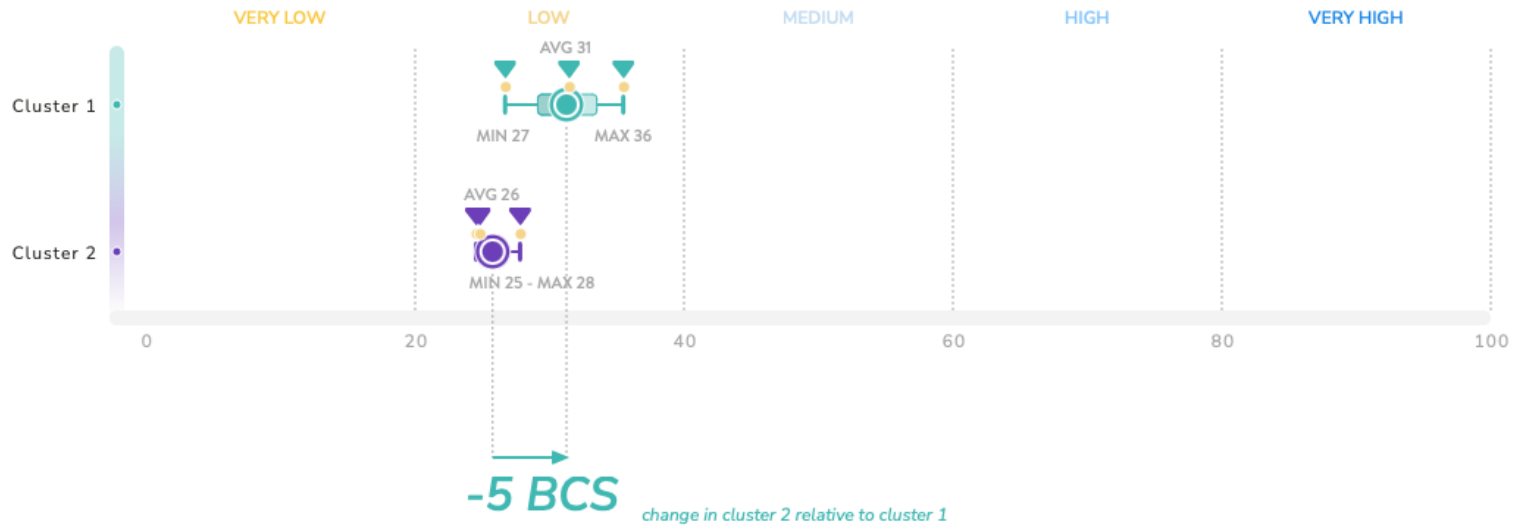


MINOR NUTRIENTS

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

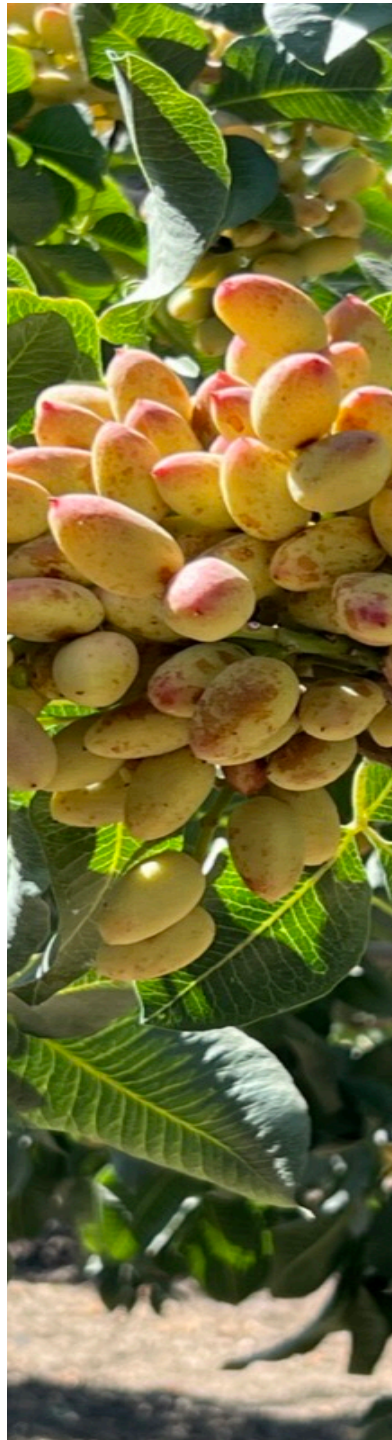
IRON MOBILIZATION

Iron is the fourth most abundant element found in soil though it is largely present in forms that cannot be taken up by plants. Previously solubilized Iron is essential for microbial enzymatic structures and activities such as nitrogen fixation.



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MICROBIAL CHANGES

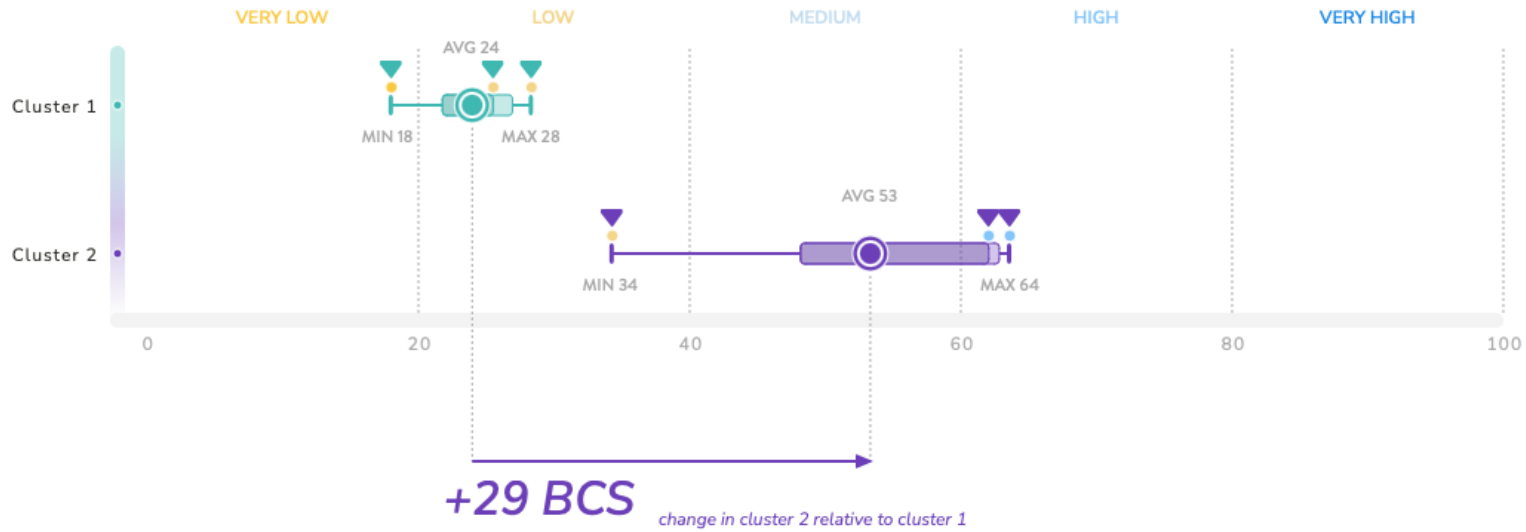


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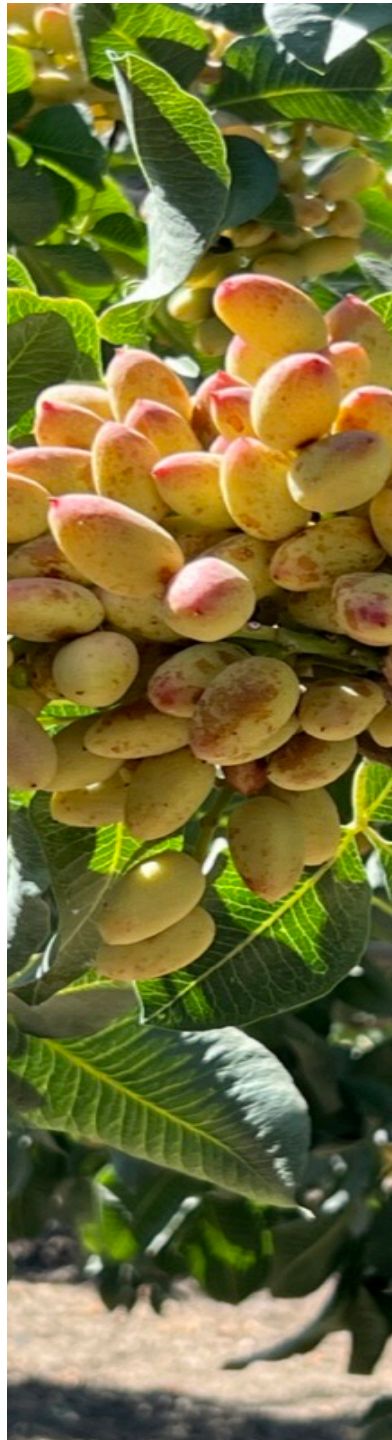
CALCIUM TRANSPORT

Calcium contributes to soil fertility by regulating the assimilation of other nutrients. Calcium deficiency symptoms in crops are usually caused by low calcium availability or water stress which result in low transpiration rates. High microbial transport of calcium helps to maintain the physical properties of the soil and to stabilize soil structure.



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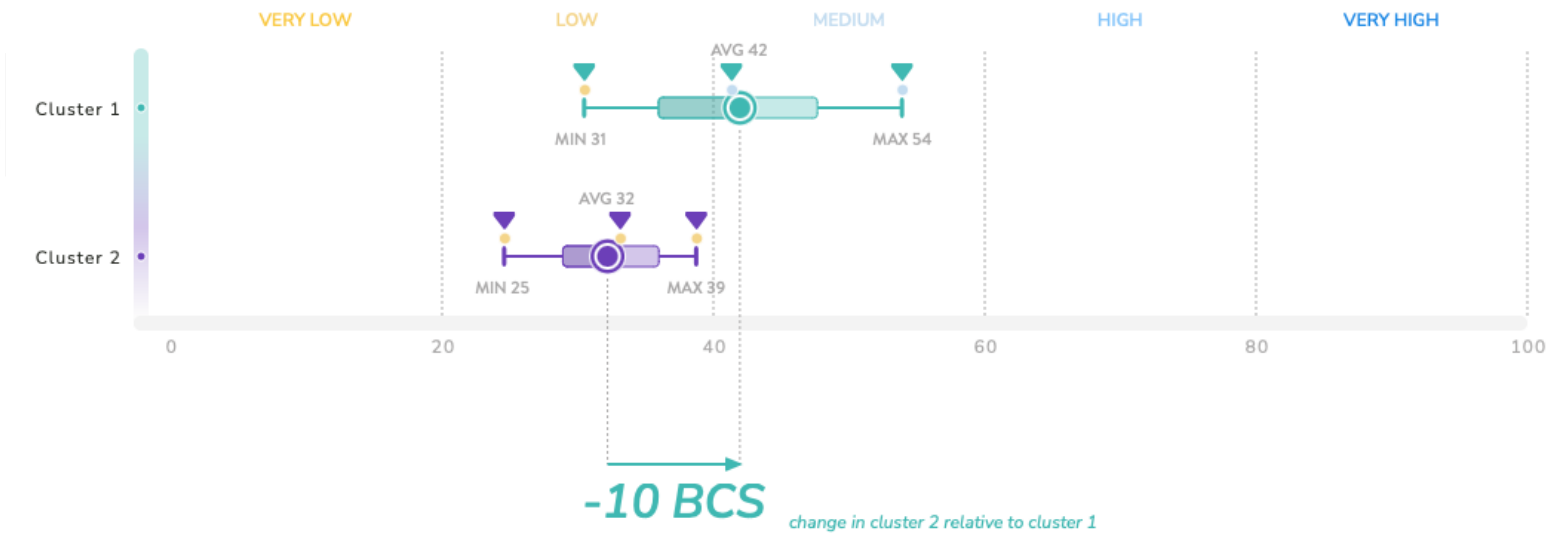


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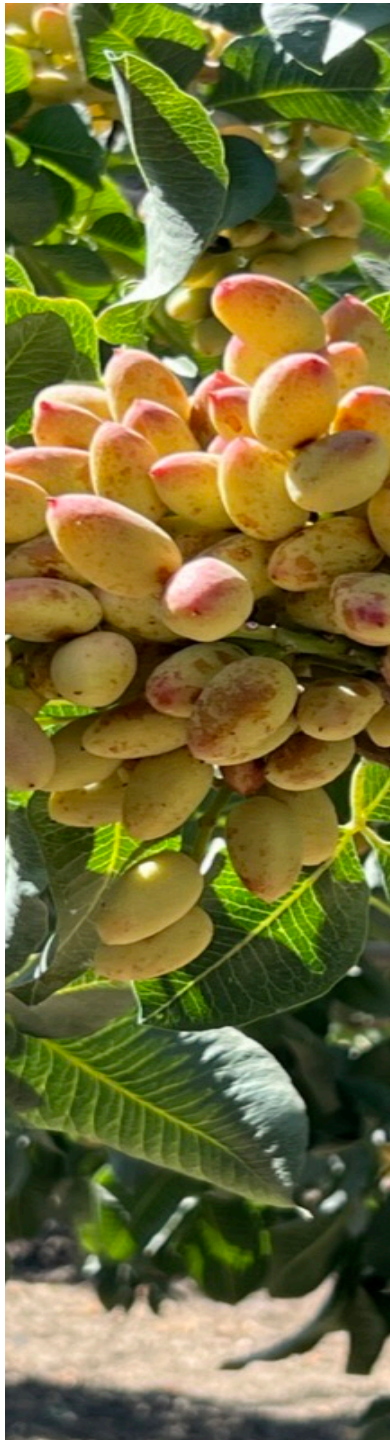
ZINC TRANSPORT EQUILIBRIUM

Zinc is a micronutrient that plant needed in small amounts, yet it is crucial to correct plant development. It is key for the constitution of many proteins and enzymes and is essential for hormone production processes. Microbes are indicators of zinc problems through alterations of import/export processes to their cells indicates a sufficient potential for iron microbial mobilization.



MICROBIAL CHANGES

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MINOR NUTRIENTS

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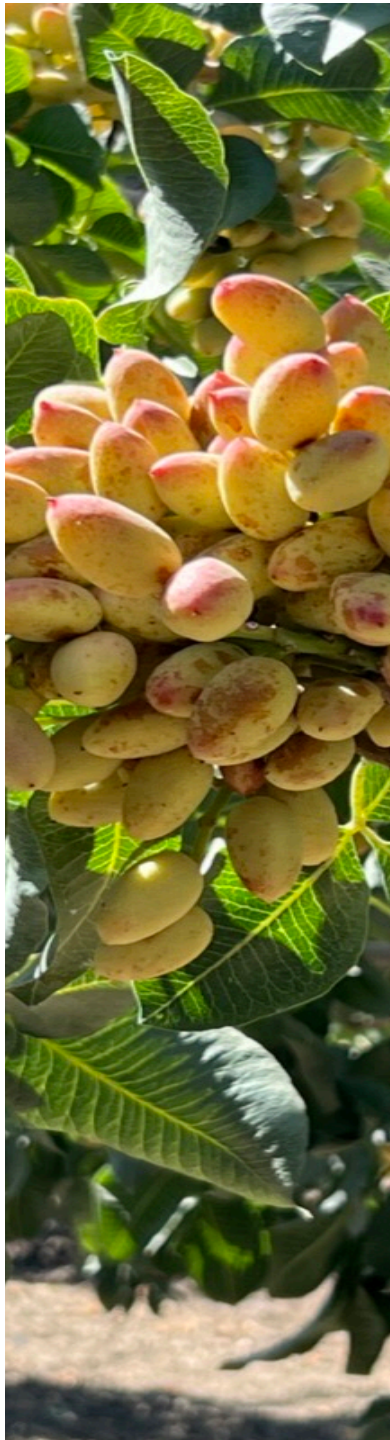
COPPER EXPORT

Copper is one of the micronutrients needed in very small quantities by plants, rarely limiting, and excesses can be toxic. Copper toxicities can have a negative impact on crop growth and quality. Microbes are good indicators of copper excesses through export mechanisms.



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MICROBIAL CHANGES

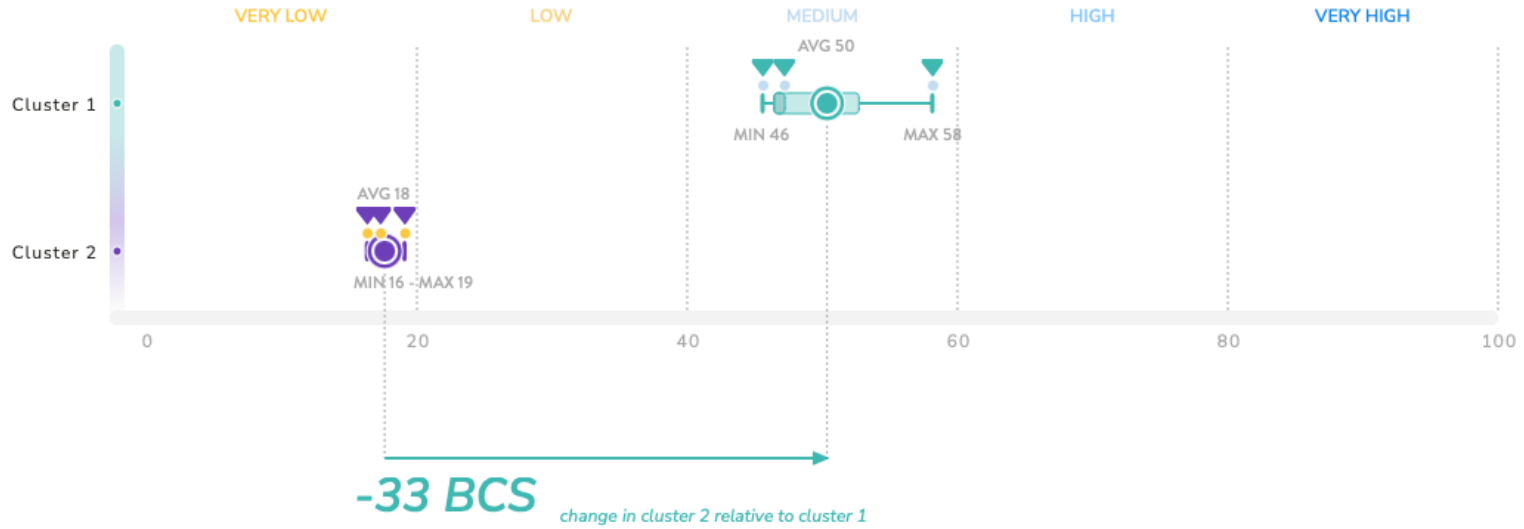


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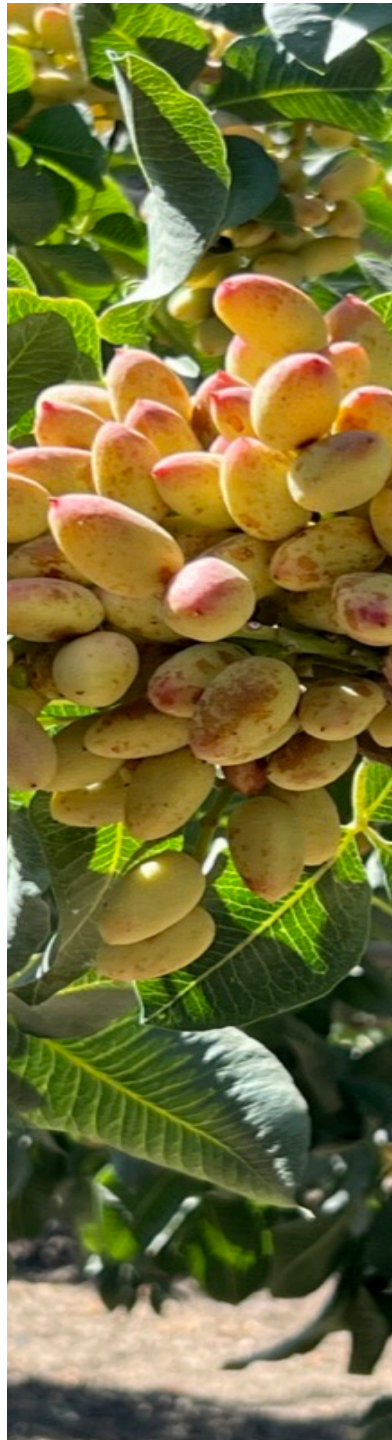
MANGANESE TRANSPORT EQUILIBRIUM

Manganese contributes to some biological systems including photosynthesis, respiration, and nitrogen assimilation. Manganese deficiency is a widespread problem, most often occurring in sandy soils, organic soils with a pH above 6, and heavily weathered tropical soils. Microbes are indicators of manganese problems through alterations of import/ export processes to their cells.



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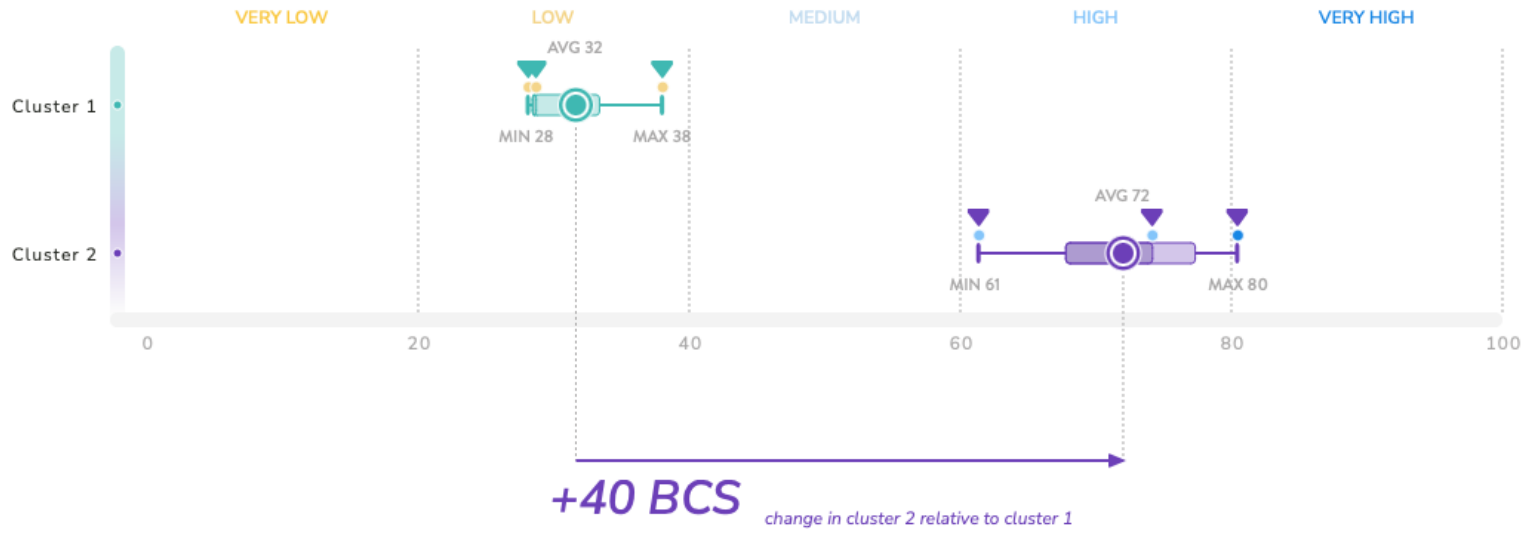


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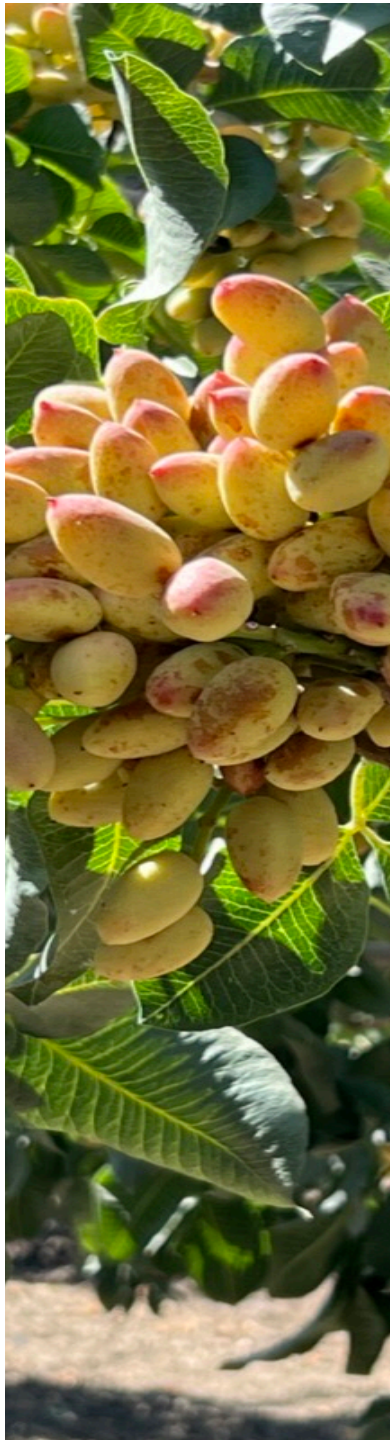
MAGNESIUM TRANSPORT

Magnesium is the central molecule of Chlorophyll, a nutrient involved in many enzyme activities and the structural stabilization of tissues. It plays a key role in phosphorus transportation to where it is needed and the use of iron. It is crucial for the uptake of nutrients and for nitrogen fixation.



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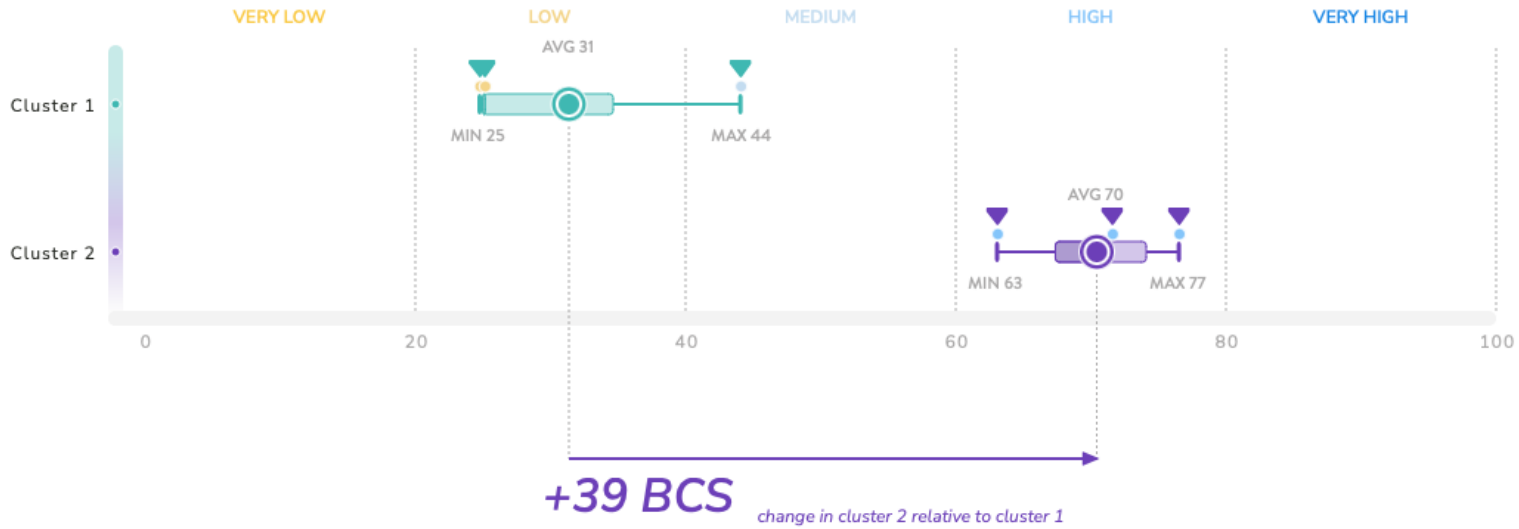


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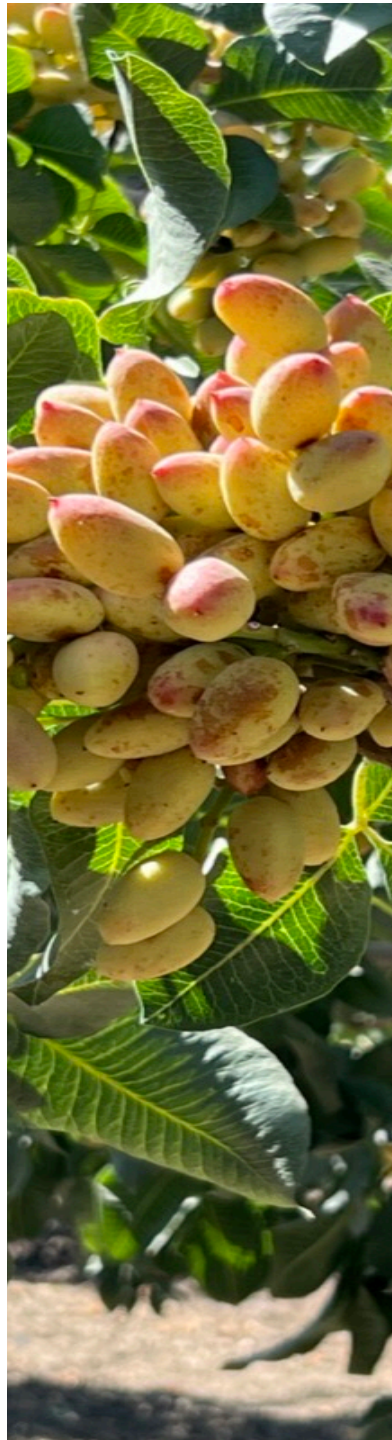
SULFUR CYCLE EQUILIBRIUM

Sulfur is an essential nutrient that plants need in sufficient amounts to maintain good health and achieve high yields. It is found in organic matter, but it is not available to plants in this form, so it must go through mineralization and cycling processes. It is crucial for chlorophyll formation, and it is an active agent in the metabolism of nitrogen.



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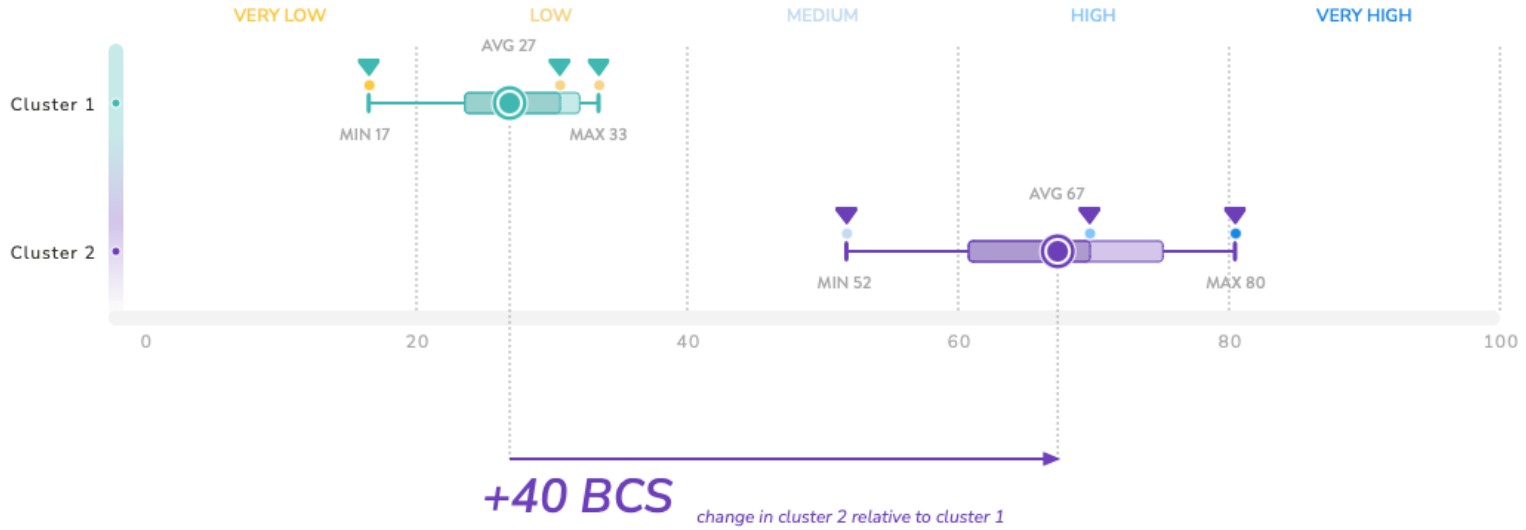


MINOR NUTRIENTS

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CHLORINE TRANSPORT

Chlorine is an important micronutrient that takes part in several physiological metabolic processes such as in disease resistance and tolerance, as well as in fruit quality and crop yields. Medium to high levels of microbial transport helps to sustain a good equilibrium of this micronutrient. Soils may become deficient in chlorine if rainfall is high, or plants are irrigated too frequently, especially in sandy soils.



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