



CROP
Soybean



GROWER
Grower Name



FARM
Farm Name



FIELD
Field Name



SAMPLING DATES
10/17/2021

Sample Name	Sample Date	Tags	Crop	Bacterial Diversity	Denitrification Potential	Nitrate Ammonification Potential	Nitrification Potential	Oxygen Availability	Phosphorus Mineralization Potential	Phosphorus Solubilization Potential
A Zone	10/17/21	A Zone	Soybean	1096.03	0.45	0.23	0.24	63.77	0.67	1.21
B Zone	10/17/21	B Zone	Soybean	1153.06	0.41	0.21	0.24	66.96	0.67	1.13
C Zone	10/17/21	C Zone	Soybean	1127.15	0.3	0.17	0.2	68.77	0.66	1.06
D Zone	10/17/21	D Zone	Soybean	1472.7	0.36	0.19	0.25	69.91	0.67	1.04

* All measurements are unitless

Legend	Soybean	<807.08	>0.42	<0.1	>0.25	<67.59	<0.47	<0.85
		>1095.06	< 0.33	>0.21	< 0.2	>74.23	>0.67	>1.16

Indicator	Definition
Bacterial Diversity	<p data-bbox="600 395 813 419">Bacterial Diversity</p> <ul data-bbox="600 448 2163 719" style="list-style-type: none"> <li data-bbox="600 448 2163 504">•The bacterial diversity indicator is a unitless index that takes into account the number of species present (richness) as well as the relative abundance of each species (balance or evenness). <li data-bbox="600 531 2163 639">•This diversity indicator includes both bacteria and archaea, which are classified as prokaryotes and both are typically unicellular organisms. Certain soil processes are carried out either by bacteria or archaea or both. For example, both groups are involved in nitrification. To ease communication we use the term “bacterial” diversity instead of “prokaryotic” diversity, as the former is more familiar to most users. <li data-bbox="600 667 2163 719">•Bacterial diversity is expected to be higher at moderate soil pH (not very acidic nor very alkaline) and in soils that experience minimal disturbances, such as no-till. Bacterial diversity also tends to increase with decreasing soil moisture content.
Denitrification Potential	<p data-bbox="600 770 1205 794">Nitrate (NO₃⁻) → Dinitrogen/Nitrous Oxide (N₂/N₂O)</p> <ul data-bbox="600 823 2163 1010" style="list-style-type: none"> <li data-bbox="600 823 1843 847">• Denitrification is a process where specific soil organisms convert nitrate to gaseous forms of nitrogen. <li data-bbox="600 874 2163 930">• The Denitrification indicator represents the abundance of genes belonging to denitrifying organisms and are specifically involved in these nitrogen transformation processes. <li data-bbox="600 957 2163 1010">• This form of loss mainly occurs in waterlogged soils with reduced oxygen availability. Addressing the source of waterlogging or making multiple in-season nitrogen applications are ways to mitigate nitrogen loss through denitrification.
Nitrate Ammonification Potential	<p data-bbox="600 1062 1025 1086">Nitrate (NO₃⁻) → Ammonium (NH₄⁺)</p> <ul data-bbox="600 1117 2163 1302" style="list-style-type: none"> <li data-bbox="600 1117 2163 1173">• The Nitrate ammonification indicator represents the abundance of genes belonging to organisms that have the capability of converting nitrate to ammonium. <li data-bbox="600 1200 2163 1256">• This process can contribute to nitrogen retention by counteracting nitrogen loss from leaching or denitrification, particularly under low oxygen conditions and at higher soil pH. <li data-bbox="600 1283 1630 1307">• This process is also known as Dissimilatory Nitrate Reduction to Ammonium (DNRA).

Indicator	Definition
Nitrification Potential	<p data-bbox="593 391 1025 421">Ammonium (NH₄⁺) → Nitrate (NO₃⁻)</p> <ul data-bbox="593 443 2184 582" style="list-style-type: none"> <li data-bbox="593 443 2184 502">• Nitrification is a process where specific soil microorganisms convert ammonium to nitrate, which is the form of nitrogen that is most susceptible to loss. <li data-bbox="593 523 2184 582">• The Nitrification indicator represents the abundance of genes belonging to nitrifying organisms and which are specifically involved in this process.
Oxygen Availability	<ul data-bbox="593 630 2184 769" style="list-style-type: none"> <li data-bbox="593 630 2184 689">• The Oxygen availability indicator reflects the oxygen status of the soil by quantifying the amount of organisms that are adapted to low oxygen levels. <li data-bbox="593 710 2184 769">• This indicator gives us insight into the porosity and waterlogging of soil and contributes to the interpretation of other microbial indicators that are sensitive to oxygen, such as Denitrification.
Phosphorus Mineralization Potential	<p data-bbox="593 813 1093 844">Organic Phosphorus → Phosphate (PO₄³⁻)</p> <ul data-bbox="593 866 2184 981" style="list-style-type: none"> <li data-bbox="593 866 2184 925">• The Phosphorus mineralization indicator represents the abundance of genes belonging to organisms that release available phosphorus from organic forms. <li data-bbox="593 946 2184 981">• This allows phosphorus that is stored in soil organic matter to be added to the plant-available pool.

Indicator	Definition
Phosphorus Solubilization Potential	<p data-bbox="600 395 1384 426">Non-Labile Phosphate (PO_4^{3-}) → Plant-Available Phosphate (PO_4^{3-})</p> <ul data-bbox="600 448 2105 558" style="list-style-type: none"><li data-bbox="600 448 2105 502">• The Phosphorus solubilization indicator represents the abundance of genes belonging to organisms that are involved in the process of liberating phosphate from soil minerals.<li data-bbox="600 526 2105 558">• This allows previously plant-unavailable phosphorus to be added to the plant-available pool.