

ONTLEDINGSVERSLAG / ANALYSIS REPORT

PLAASNAAM / FARM NAME: Example
Verslagnommer / Report Number: xxx/2024
Verslag Datum / Report Date: 2024/xx/xx
Monster ontvang / Sample Received: 2024/xx/xx

Opsomming van Resultate / Summary of Results:

Monsternaam / Sample name	Lab no.	Mikrobiële diversiteit / Microbial Diversity		
		Resultate / Results		Aanbeveling / Recommendation
		Bakteriële / Bacteria	Fungi	
Grond 1	G614	High Diversity High Evenness	High Diversity High Evenness	
Grond 2	G615	High Diversity High Evenness	High Diversity High Evenness	

Monsternaam / Sample name	Lab no.	Soil Enzymatic Activity			
		Resultate / Results			
		β -Glucosidase	Acid Phosphatase	Alk Phosphatase	Urease
Grond 1	G614	Low activity - Use compost or mulch	High activity	High activity	High activity
Grond 2	G615	Low activity - Use compost or mulch	High activity	High activity	Low activity - Use mulch or manure

Terms and conditions

Results are subject to the correct sampling, storing and transport procedures being followed.

Termes en voorwaardes

Die resultate is onderhewig daaraan dat die korrekte monsterneming, berging en vervoerprosedures gevolg is.



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The species richness is higher (compared to our previous service), due to the higher resolution of the technology

Bakteriële Gemeenskapsanalise / Bacterial Community Analysis

Monsternaam / Sample name	Lab no.	Shannon indeks / index	Simpson's indeks / index	Spesierikheid / Species richness	Spesierikheid >0,1% / Species richness >0,1% *
Grond 1	G614	3,27	0,99	2208	154
Grond 2	G615	3,27	0,98	2089	177

*Sluit slegs spesies in met 'n relatiewe volheid bo 0,1% / Only includes species with a relative abundance above 0,1%

Bakteriële Spesies Volheid (%) van Belang / Bacterial Species Relative Abundance (%) of Importance

Monsternaam / Sample name	Lab no.	<i>Bacillus</i> spp.	<i>Bradyrhizobium</i> / <i>Rhizobium</i> spp.	<i>Azotobacter</i> spp.	<i>Streptomyces</i> spp.
Grond 1	G614	0,15	8,55	0,00	0,00
Grond 2	G615	0,12	5,89	0,00	0,00

Bakteriële Funksies (%) van Belang / Bacterial Functions (%) of Interest

Monsternaam / Sample name	Lab no.	Chemoheterotrofe / Chemoheterotrofe	Photoheterotrofe / Fotoheterotrofe	Nitrogen Fixation / Stikstofbinding	Ureolysis / Ureolise	Denitrification / Denitrifikasie
Grond 1	G614	19,56	0,66	1,18	0,32	0,62
Grond 2	G615	19,19	0,79	2,18	1,32	1,62

A guide for results interpretation:

Shannon index

This index is used to observe the richness and evenness of the microbial community within a sample.

Values typically lie between 1.5 and 3.5, but can reach above 4.

It is calculated by looking at the number of different species and their abundance.

A high Shannon index indicates that the microbial community has a high diversity.

A low value indicates that the microbial community has a low diversity.

Simpson's index

This index is used along with the Shannon index to describe the microbial evenness within a sample.

These values will always fall between 0 and 1.

A value close to 1 indicates low dominance.

A value closer to 0 indicates that the microbial community within the sample is dominated by one or more microorganisms.

Species richness

This value shows the number of Operational Taxonomic Units (OTUs).

A higher OTU value indicates a high level of diversity.

Relative abundance

Relative species abundance is a component of biodiversity and is a measure of how common or rare a species is relative to other species in a community.

Relative abundance is the percent composition of an organism of a particular kind relative to the total number of organisms in the area.

Chemoheterotrofe

Chemoheterotrofe are unable to synthesise their own organic molecules, and thrive in environments that are capable of sustaining other forms of life.

Photoheterotrofe

Photoheterotrofe are organisms that get their energy from light, but must still consume carbon from other organisms.

Nitrogen Fixation

A process by which atmospheric nitrogen (N₂) is converted into ammonia.

Ureolysis

The ability to break down urea into ammonia and CO₂.

Denitrification

The microbial process of reducing nitrate and nitrite to gaseous forms of nitrogen, like nitrous oxide.

Gids vir interpretasie:

Shannon Indeks

Die indeks word gebruik om die spesierikheid en eweredigheid van die mikrobiële gemeenskap waar te neem.

Waardes is gewoonlik tussen 1.5 en 3.5, maar kan in sommige gevalle hoër as 4 wees.

Dit word bereken deur die aantal spesies en die hoeveelheid van elke spesie te gebruik.

'n Hoë Shannon indeks dui aan dat die gemeenskap 'n hoë diversiteit het.

'n Lae waarde dui aan dat die gemeenskap 'n lae diversiteit het.

Simpson Indeks

Die indeks word saam met die Shannon indeks gebruik om die gelykheid in 'n monster te beskryf.

Die waardes is altyd tussen 0 en 1.

'n Waarde naby aan 1 dui min dominansie aan.

'n Waarde naby aan 0 dui dominansie van 'n spesie of 'n paar spesies aan in die monster.

Spesierikheid

Dit dui die aantal Operasionele Taksonomiese Eenhede (OTE) aan.

'n Hoër OTU-waarde dui op 'n hoë vlak van diversiteit.

Relatiewe Volheid

Relatiewe spesie-oorslag is 'n komponent van biodiversiteit en is 'n maatstaf van hoe algemeen of skaars 'n spesie is relatief tot ander spesies in 'n gemeenskap.

Relatiewe oorslag is die persentasie samestelling van 'n organisme van 'n bepaalde soort relatief tot die totale aantal organismes in die gemeenskap.

Chemoheterotrofe

Chemoheterotrofe is nie in staat om hul eie organiese molekules te sintetiseer nie, en floreer in omgewings wat in staat is om ander vorme van lewe te onderhou.

Fotoheterotrofe

Fotoheterotrofe is organismes wat hul energie van lig kry, maar steeds koolstof van ander organismes moet verbruik.

Stikstofbinding

'n Proses waardeur atmosferiese stikstof (N₂) in ammoniak omgeskakel word.

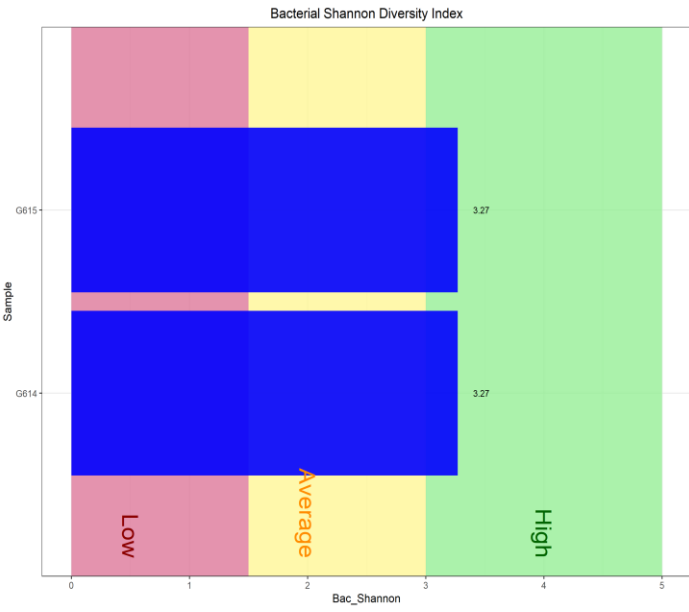
Ureolise

Die vermoë om ureum in ammoniak en CO₂ af te breek.

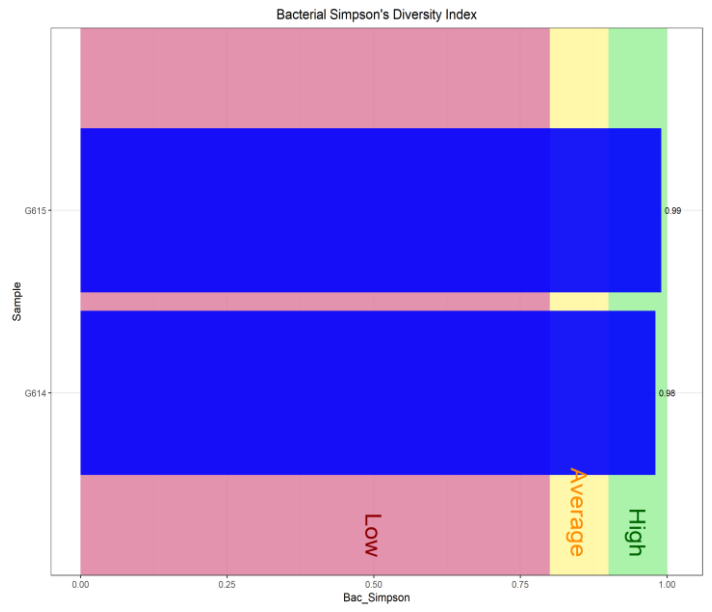
Denitrifikasie

Die mikrobiële proses om nitraat en nitriet af te breek tot gasvormige vorme van stikstof, soos stikstofdoksied.

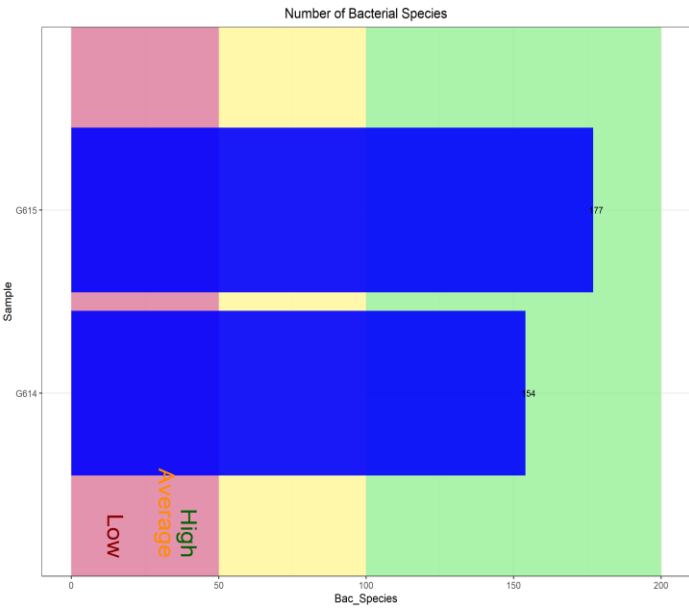
Bakteriële Shannon Diversiteitsindeks / Bacterial Shannon Diversity Index



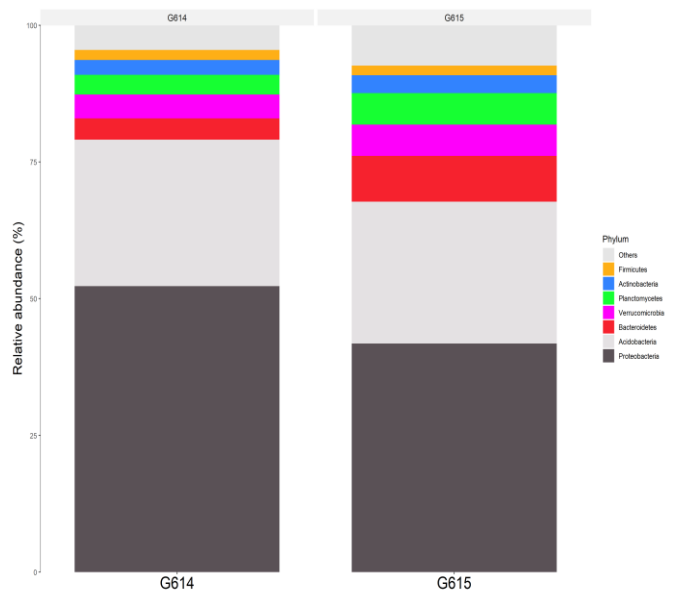
Bakteriële Simpson Diversiteitsindeks / Bacterial Simpson's Diversity Index



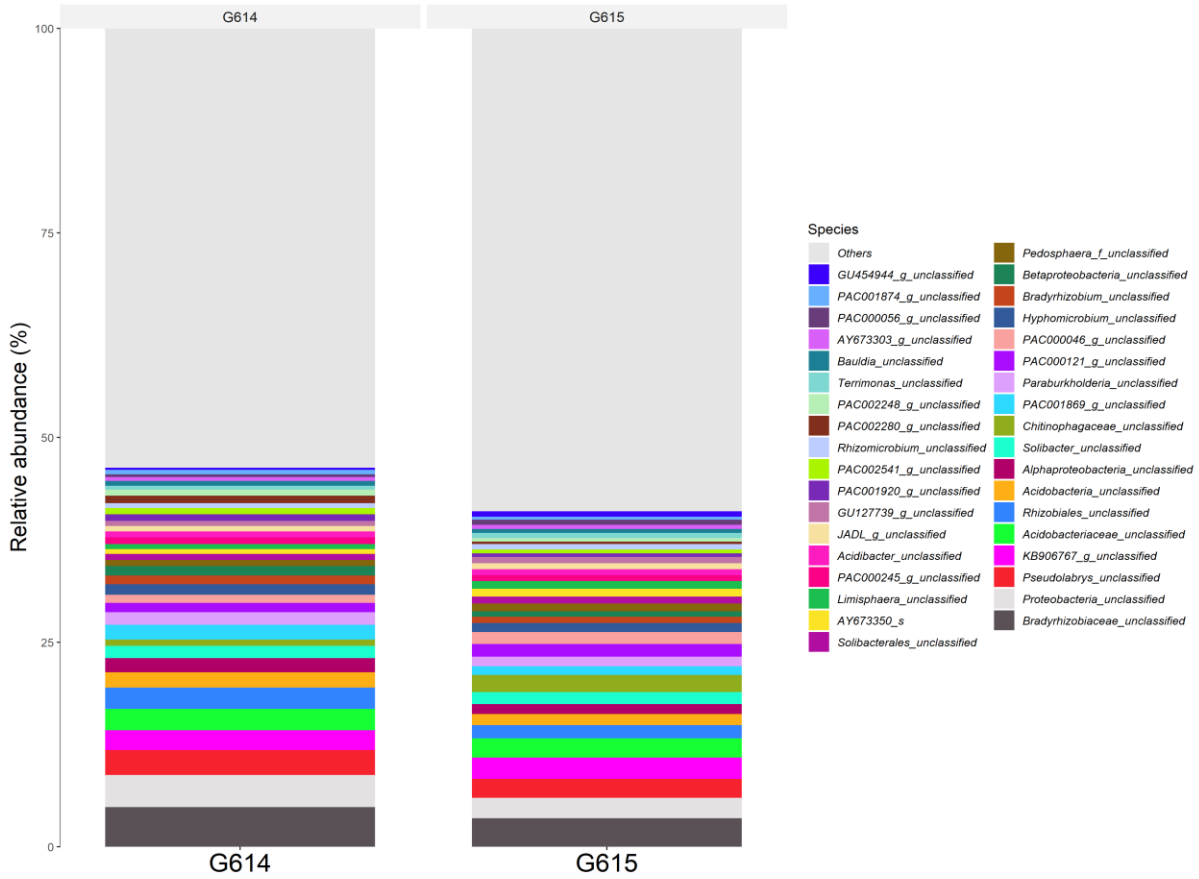
Bakteriële Spesierykheid / Bacterial Species Richness



Bakteriële Relatiewe Volheid / Bacterial Relative Abundance



Bakteriële Relatieve Volheid/ Bacterial Relative Abundance



Bakteriële Funktionele Groepe / Bacterial Functional Groups



Fungi Gemeenskapsanalise / Fungal Community Analysis					
Monsternaam / Sample name	Lab no.	Shannon indeks / index	Simpson's indeks / index	Spesierykheid / Species richness	Spesierykheid >0,1% / Species richness >0,1% *
Grond 1	G614	2,65	0,98	140	56
Grond 2	G615	2,51	0,98	92	55

*Sluit slegs spesies in met 'n relatiewe volheid bo 0,1% / Only includes species with a relative abundance above 0,1%

Fungi Spesie Volheid (%) van Belang / Fungal Species Relative Abundance (%) of Interest						
Monsternaam / Sample name	Lab no.	<i>Trichoderma</i> spp.	<i>Fusarium</i> spp.	Ectomycorrhizal	Arbuscular Mycorrhizal	Ericoid Mycorrhizal
Grond 1	G614	0,57	0,48	0,60	0,05	0,05
Grond 2	G615	0,33	0,50	1,17	0,04	0,00

Fungi Funksies (%) van Belang / Fungal Functions (%) of Interest					
Monsternaam / Sample name	Lab no.	Pathotroph	Saprotroph	Symbiotroph	Endofyete
Grond 1	G614	7,53	43,59	6,52	4,71
Grond 2	G615	6,74	29,29	7,11	4,85

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Pathotroph

Pathotrophs are fungi that derive nutrients from a host or cause disease.

Saprotroph

Saprotrophs are organisms that obtain their nutrients by decomposing dead organic matter. They play a crucial role in breaking down complex organic compounds and the cycling of nutrients

Symbiotroph

An organism that derives nourishment through a symbiotic relationship with another organism. Symbiotrophic fungi can improve plant nutrition by establishing plant-mycorrhizal associations.

Gids vir interpretasie:

Shannon Indeks

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Relatiewe oorvloed is die persentasie samestelling van 'n organisme van 'n bepaalde soort relatief tot die totale aantal organismes in die gemeenskap.

Patotroef

Patotrofe is swamme wat voedingstowwe van 'n gasheer verkry of siektes veroorsaak.

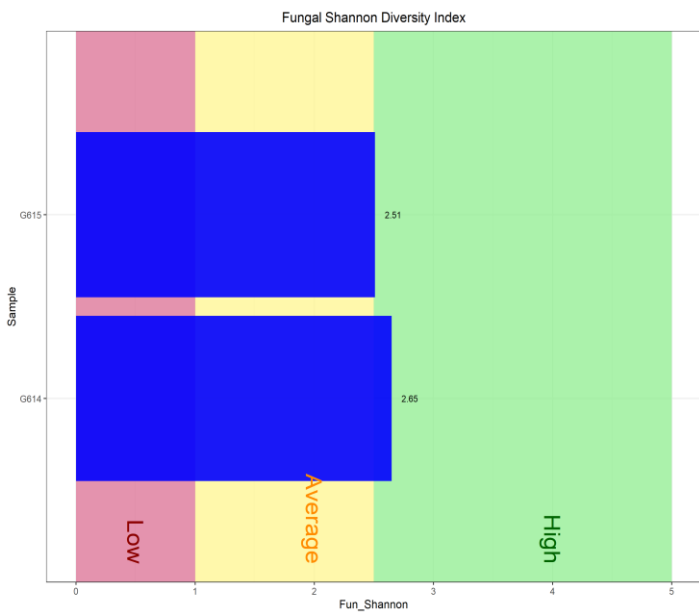
Saprotroef

Saprotrofe is organismes wat hul voedingstowwe verkry deur dooie organiese materiaal te ontbind. Hulle speel 'n belangrike rol in die afbreek van komplekse organiese verbindinge en die siklusse van voedingstowwe.

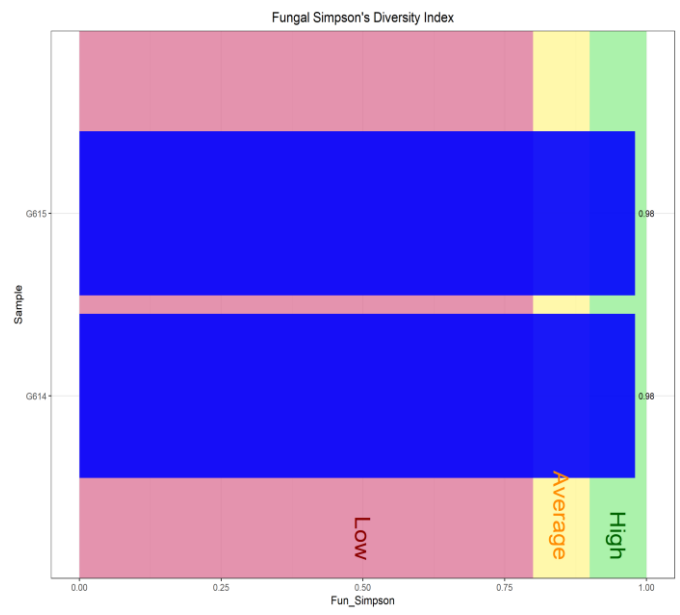
Simbiotroef

'n Organisme wat voeding verkry deur 'n simbiotiese verhouding met 'n ander organisme. Simbiotrofe swamme kan plantvoeding verbeter deur plant-mikoriële assosiasies te vestig.

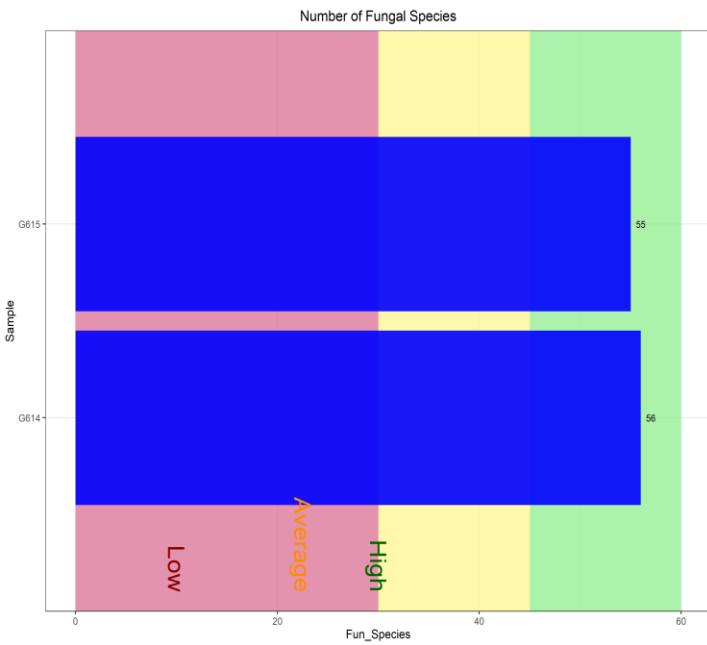
Fungi Shannon Diversiteitsindeks / Fungal Shannon Diversity Index



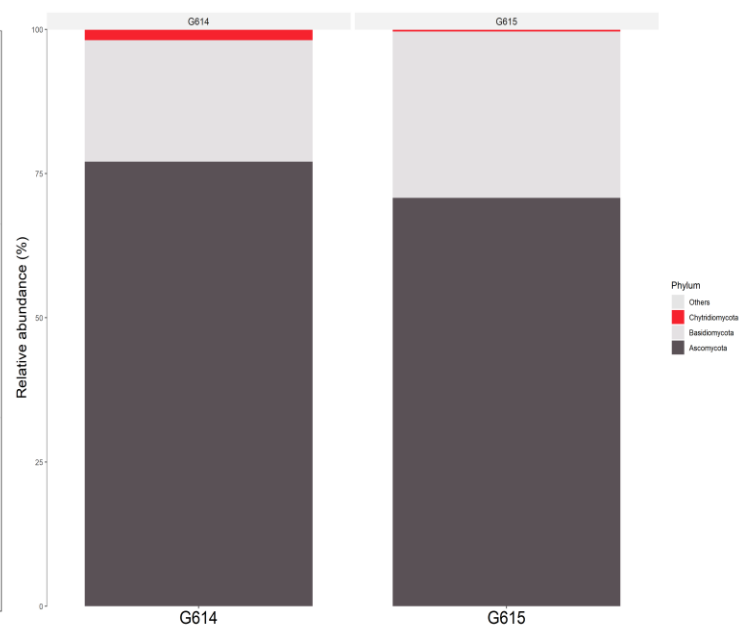
Fungi Simpson Diversiteitsindeks / Fungal Simpson's Diversity Index



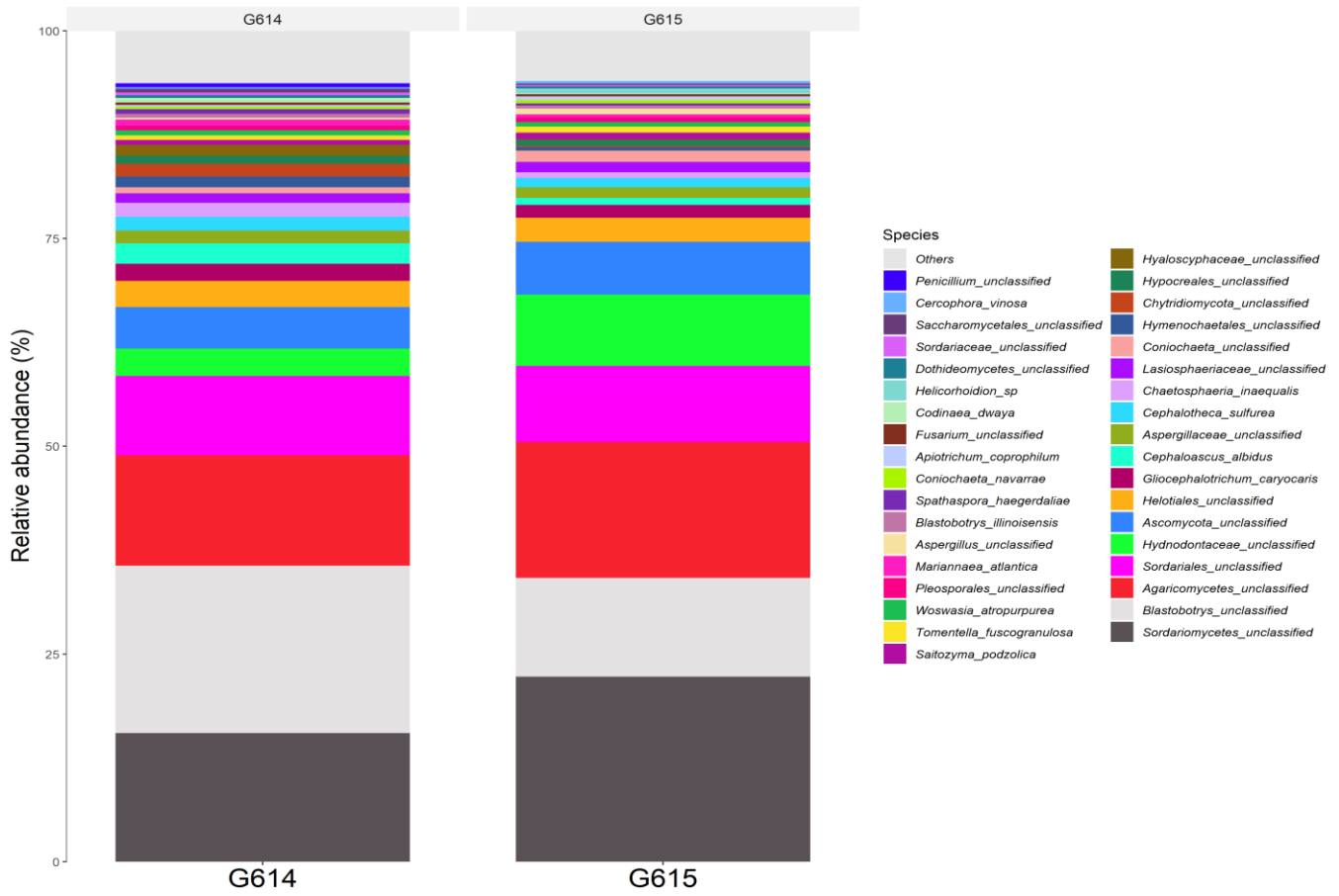
Fungi Spesierykheid / Fungal Species Richness



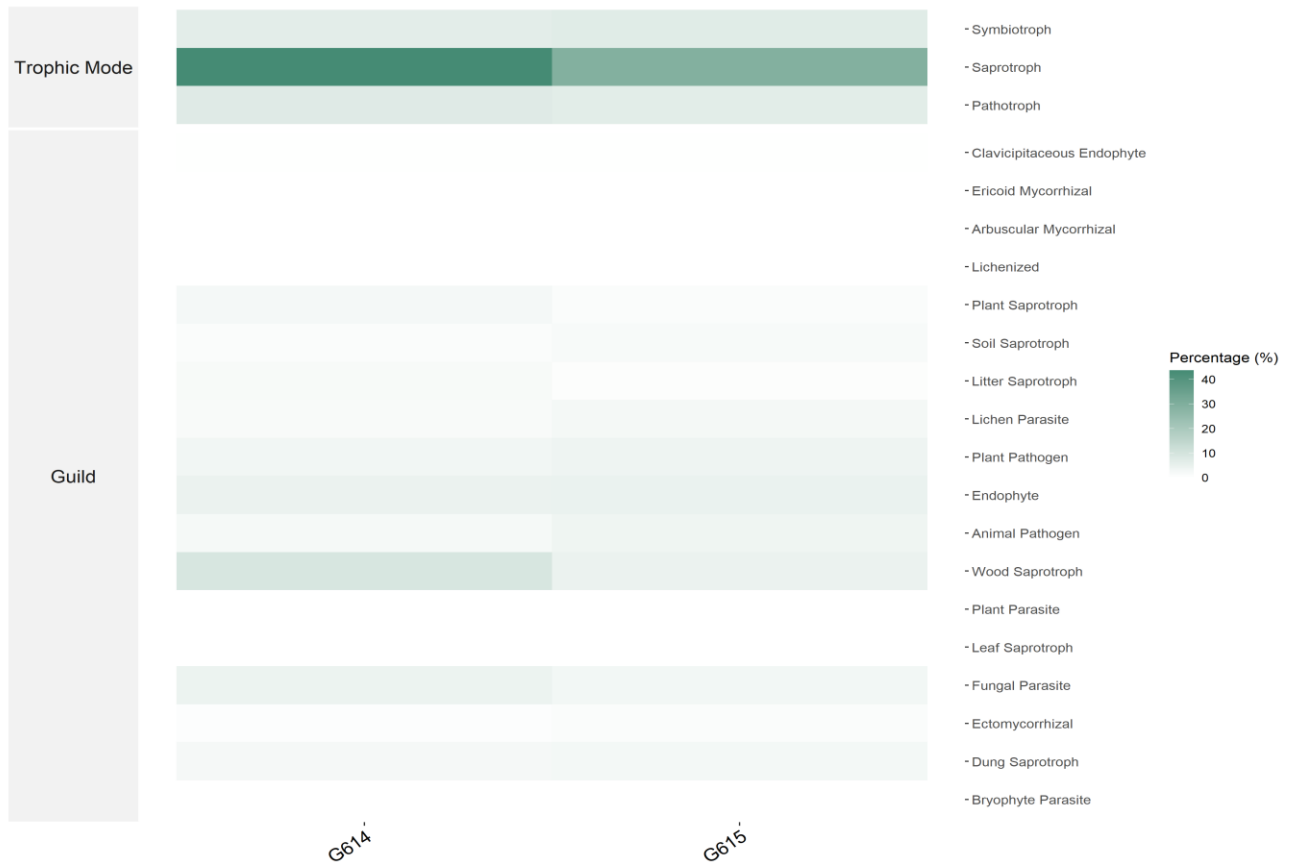
Fungi Relatiewe Votheid / Fungal Relative Abundance



Fungi Relatiewe Volheid/ Fungal Relative Abundance



Fungi Funktionele Groepe / Fungal Functional Groups



Grondensimatiëse en Chemiese Analises / Soil Enzymatic and Chemical Analyses:

Monsternaam / Sample name	Lab no.	Soil Moisture (Dry soil/g)	Electrical Conductivity (microsiemens/cm)	pH (water)	Organic Carbon %	Organic Matter %
Grond 1	G614	0,92	75,20	6,21	0,53	5,63
Grond 2	G615	0,88	113,50	5,99	1,11	6,66

Monsternaam / Sample name	Lab no.	Active Carbon (mg POXC·kg-1 soil)	Microbial Activity (mg fluorescein·kg-1 soil·3h-1)	P (Bray II) (µg/g dry soil)
Grond 1	G614	825,30	251,80	110,90
Grond 2	G615	625,44	190,25	82,36

Monsternaam / Sample name	Lab no.	NO3 (µg/g dry soil)	NH4 (µg/g dry soil)	Nmin - NH4 (µg/g dry soil) per day
Grond 1	G614	15,23	1,28	-0,20
Grond 2	G615	11,39	2,08	-0,43

Monsternaam / Sample name	Lab no.	β-Glucosidase (µg/g dry soil / hour)	Acid Phosphatase (µg/g dry soil / hour)	Alkaline Phosphatase (µg/g dry soil / hour)	Urease (µg/g dry soil / hour)
Grond 1	G614	447,73	1934,54	1135,45	37,45
Grond 2	G615	178,98	1852,29	1858,22	17,54

A guide for results interpretation:

β-Glucosidase

β-glucosidase is the most common, important, and widely used soil quality indicator. Its role in soils is crucial since it is involved in catalyzing the hydrolysis and biodegradation of various β-glucosides that are present in plant debris.

The activity of β-glucosidase is influenced by crop residue quality and a number of soil management practices.

Acid and Alkaline Phosphatase

Phosphatases are a group of enzymes that catalyze the hydrolysis of esters and anhydrides of phosphoric acid. The amount of phosphatase present in the soil varies with the microbial count and the extent of organic materials, mineral and organic fertilizers, and other agricultural practices.

Since plants make use of only inorganic P and a large amount of soil P is organically bound, the mineralization of this organic portion can be a vital influence in plant nutrition.

To improve soil quality management and agricultural productivity, it is important to evaluate the effect of different management practices on phosphatase activity in the soil.

Urease

The urease enzyme acts by aiding the hydrolysis of urea into CO₂ and NH₃, which leads to a rise in soil pH and nitrogen loss to the atmosphere through NH₃ volatilization. The enzyme is widely distributed in nature, and it originates from bacteria, yeasts, fungi, algae, animal waste and plants.

Urease activity has been widely used to monitor soil quality because it is influenced by different agricultural management practices.

The activity of urease increases with organic fertilization such as compost, sewage sludge and straw mulch, and decreases with soil tillage.

Active Carbon

Active carbon is an indicator of the fraction of soil organic matter that is readily available as a carbon and energy source for the soil microbial community.

As one component of the total organic carbon pool, active carbon has a strong relationship with overall soil organic matter, but it responds more quickly to changes in crop and soil management.

Active carbon should be utilized as a tracking tool to measure improvement in soil quality. A higher reading indicates an improvement.

Microbial activity

Fluorescein diacetate (FDA) hydrolysis is most accepted as an accurate and simple method for measuring total microbial activity in a range of environmental samples, including soils.

The enzymes responsible for FDA hydrolysis are plentiful in the soil environment. Nonspecific esterases, proteases and lipases are involved in the decomposition of many types of tissue. The ability to hydrolyse FDA thus seems widespread, especially among the major decomposers, bacteria and fungi.

Gids vir interpretasie:

β-Glukosidase

β-glukosidase is die mees algemene en belangrikste grondkwaliteit-aanwyser. Die rol daarvan in gronde is van kardinale belang aangesien dit betrokke is by die kataliseer van die hidrolise en biodegradasie van verskeie β-glukosiede wat in plantafval voorkom.

Die aktiwiteit van β-glukosidase word beïnvloed deur oesreste kwaliteit en 'n aantal grondbestuurspraktyke.

Suur en Alkalesie Fosfatase

Fosfatase is 'n groep ensieme wat die hidrolise van esters en anhidriede van fosforsuur kataliseer. Die hoeveelheid fosfatase teenwoordig in die grond wissel met die mikrobiële telling en die omvang van organiese materiale, minerale en organiese bemestingstowwe, en ander landboupraktyke.

Aangesien plante slegs van anorganiese P gebruik maak en 'n groot hoeveelheid grond P organies gebonde is, kan die mineralisering van hierdie organiese gedeeltes 'n belangrike invloed in plantvoeding wees.

Om grondkwaliteitbestuur en landbouproduktiwiteit te verbeter, is dit belangrik om die effek van verskillende bestuurspraktyke op fosfatase-aktiwiteit in die grond te evalueer.

Urease

Die urease-ensiem werk deur die hidrolise van ureum na CO₂ en NH₃ aan te help, wat lei tot 'n styging in grond pH en stikstofverlies na die atmosfeer deur NH₃-vervlugting. Die ensiem is wydverspreid in die natuur, en dit is afkomstig van bakterieë, giste, swamme, alge, diere-afval en plante.

Urease-aktiwiteit word wyd gebruik om grondkwaliteit te monitor omdat dit deur verskillende landboubestuurspraktyke beïnvloed word.

Die aktiwiteit van urease neem toe met organiese bemesting soos kompos, rioolslyk en strooideklaag, en neem af met grondbewerking.

Aktiewe Koolstof

Aktiewe koolstof is 'n aanduiding van die fraksie van grondorganiese materiaal wat onmiddellik beskikbaar is as 'n koolstof- en energiebron vir die grondmikrobiële gemeenskap.

As een komponent van die totale organiese koolstofpoel, het aktiewe koolstof 'n sterk verwantskap met algehele grondorganiese materiaal, maar dit reageer vinniger op veranderinge in gewas- en grondbestuur.

Aktiewe koolstof moet as 'n opsporinginstrument gebruik word om verbetering in grondkwaliteit te meet. 'n Hoër lesing dui op 'n verbetering.

Mikrobiële aktiwiteit

Fluoresendiasetaat (FDA) hidrolise word die meeste aanvaar as 'n akkurate en eenvoudige metode om totale mikrobiële aktiwiteit in 'n reeks omgewingsmonsters, insluitend gronde, te meet.

Die ensieme wat verantwoordelik is vir FDA-hidrolise is volop in die grondomgewing.

Nie-spesifieke esterases, proteases en lipases is betrokke by die ontbinding van baie tipes weefsels. Die vermoë om FDA te hidroliseer lyk dus wydverspreid, veral onder die belangrikste ontbinders: bakterieë en swamme.

