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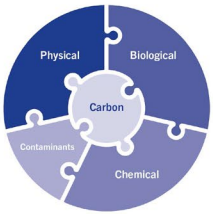
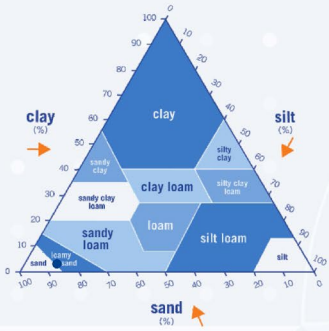
Soil Health Indicator

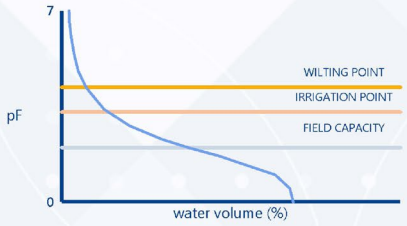
Soil Health Indicator is part of Eurofins Soil Health Solutions. The healthier the soil, the better the contribution to Sustainable Development Goals.

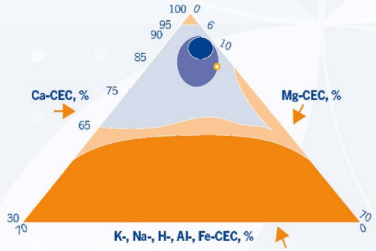


A B C D E

The Foundation







Prudent use of water and nutrients

Soil composition	%
Clay	3
Silt	11
Sand	82
Carbonate lime ($CaCO_3$)	<0.5
Soil organic matter (SOM)	4.4

pH	-	low	rather low	good	rather high	high
pH_$CaCl_2$	5.5			●		
pH_water	6			●		

Soil structure	Score	low	rather low	good	rather high	high
Risk soil slaking	7.9			●		
Risk on wind erosion	5.3			●	○	
Risk soil structural degradation	10	○		●		

Soil density	g/cm³	low	rather low	good	rather high	high
Soil bulk density	1.4			●		

Salt indices		low	rather low	good	rather high	high
Na-plant available, mg/kg	<7.5		○			
Na-soil stock, kg/ha	49		●			
Electrical conductivity (EC), mS/cm25°C	0.18	○				
Exchangeable sodium, % (ESP)	0.8		●			
Sodium absorption ratio (SAR)	0.02	○				

Water holding capacity	
Plant available water, mm	46
Field capacity (pF 2.0), %	22.5
Irrigation point (pF 3.3), %	8.2
Wilting point (pF 4.2), %	4.3

Cation Exchange Complex		low	rather low	good	rather high	high
Effective CEC, mmol⁺/kg	79			●		
Ca-CEC, %	81			●		
Mg-CEC, %	15				○	
K-CEC, %	3.7			●		
Na-CEC, %	0.8		●			
Base saturation, %	100			●		

Cation Exchange Complex legend

- optimal structure
- good structure
- moderate structure
- very moderate structure
- poor structure
- current structure

Carbon Storage

		low	rather low	good	rather high	high
Soil organic matter, SOM, %	4.4					
Carbon in soil organic matter, %	51					
Nitrogen in soil organic matter, %	3.6					
Sulphur in soil organic matter, %	0.7					
C/N ratio	14					
C/S ratio	72					
Clay/SOC ratio	1.1					

Beat climate change

	%	kg C/ha	Ton CO_2/ha
Soil organic carbon, SOC	2.3	79969	293.5
Soil inorganic carbon, SIC	<0.06	<2123	<7.8
Total soil carbon, TC	<2.4	84900	311.6
	mg C/kg		
C in microbial biomass	160	571	2.1
C in bacterial biomass	82	289	1.1
C in fungal biomass	53	189	0.7
Active C (POXC)	660	2321	8.5

Soil Biodiversity

	mg PLFA/kg	low	rather low	average	rather high	high
Total bacteria	8.6					
Gram positive	2.3					
Actinomycetes	1.1					
Gram negative	6.3					
Total fungi	1.1					
Saprophytes	0.6					
Mycorrhiza	0.5					
Protozoa	0.06					

Regenerate soils

		low	rather low	average	rather high	high
Microbial biomass, mg PLFA/kg	9.8					
Microbial activity, mg N/kg	42					
Fungi/bacteria ratio	0.7					
Gram(+)/Gram(-) ratio	0.4					
Diversity Index	1.2					

Essential nutrients

Main nutrients

	mg/kg	kg/ha	low	rather low	good	rather high	high
N-plant available (mineral N)	38.0	134					
Total N stock	1590	5640					
N-supplying capacity	10.9	38.6					
S-plant available	8.30	29.4					
Total S stock	313	1110					
S-supplying capacity	2.9	10.2					
P-plant available	15.4	54.5					
Total P stock	573	2030					
K-plant available	69.1	244					
K-soil stock	114	405					
Ca-plant available	31.3	111					
Ca-soil stock	1280	4540					
Mg-plant available	93	327					
Mg-soil stock	140	495					

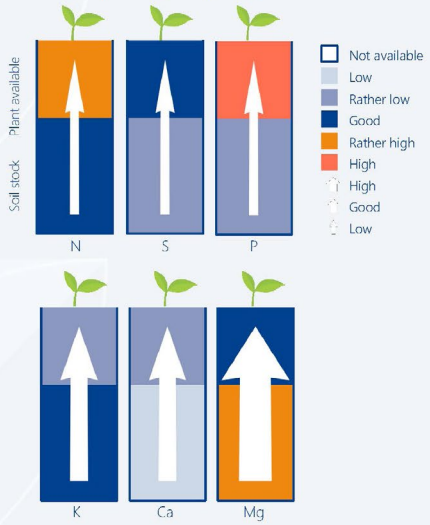
Micro nutrients

	µg/kg	g/ha
Fe-plant available	<2000	<7080
Zn-plant available	2630	9300
Ni-plant available	23	81
Mn-plant available	5100	18000
Cu-plant available	39	138
B-plant available	112	396
Mo-plant available	5.80	20.5

Beneficial nutrients

	µg/kg	g/ha
Si-plant available	7580	26814
Co-plant available	9.7	34
Se-plant available	2.2	7.8

High food & feed quantity & quality



Potential contaminants

Bio available metals*

	µg/kg	g/ha
Aluminium (Al)	5100	18000
Titanium (Ti)	122	430
Vanadium (V)	52	190
Arsenic (As)	19	69
Cadmium (Cd)	<2	<7.1
Chromium (Cr)	<20	<71
Lead (Pb)	<10	<35
Tin (Sn)	<2	<7.1

Not available
Low
Rather low
Rather high
High

Prevent health risks

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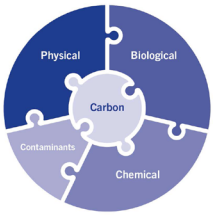

Crop based guidelines

Optimise crop yield and quality

Main nutrients	Ware potatoes Innovator	Winter wheat	Sugarbeet	Alfalfa	Silage maize	Leek Summer
Exp. yield (ton/ha)	50	9	82	20	50	42
N, kg/ha	210	180	140	25	160	120
S, kg/ha	32	28	37	25	36	41
P, kg/ha	0	0	0	0	0	0
K, kg/ha	300	94	130	90	200	140
Ca, kg/ha	60	15	52	52	37	97
Mg, kg/ha	29	12	18	12	35	18
Micro nutrients						
Fe, kg/ha	Rather low	Rather low	Rather low	Rather low	Rather low	Rather low
Zn, kg/ha	0.0	0.0	0.0	0.0	0.0	0.0
Mn, kg/ha	Rather low	Rather low	Rather low	Rather low	Rather low	Rather low
Cu, kg/ha	0.4	2.3	0.4	0.4	0.4	0.4
Ni, kg/ha	Very low	Very low	Very low	Very low	Very low	Very low
B, kg/ha	0.5	0.5	1.4	1.4	1.4	0.5
Mo, kg/ha	Very low	Very low	Very low	Very low	Very low	Very low
Beneficial nutrients						
Si, kg/ha	Good	Good	Good	Good	Good	Good
Co, kg/ha	Rather high	Rather high	Rather high	Rather high	Rather high	Rather high
Se, g/ha	Very low	Very low	Very low	Very low	Very low	Very low
Na, kg/ha	0	0	120	0	0	0

Bio available heavy metals

Al	Low amounts - no effect on crop growth and/or health risks are expected.
Ti	Low amounts - no effect on crop growth and/or health risks are expected.
V	Considerable amounts - no effect on crop growth and/or health risks are expected. However, be vigilant for possible sources of input.
As	Low amounts - no effect on crop growth and/or health risks are expected.
Cd	Negligible amounts – no effect on crop growth and/or health risks are expected.
Cr	Negligible amounts – no effect on crop growth and/or health risks are expected.
Pb	Negligible amounts – no effect on crop growth and/or health risks are expected.
Sn	Negligible amounts – no effect on crop growth and/or health risks are expected.

Soil based guidelines

	Year	Rotation (4 Years)	
P, kg/ha	19	75	
K, kg/ha	0	0	
Ca, kg/ha	62	250	
Mg, kg/ha	0	0	
Target pH (5.7), kg NV/ha		370	
0.1 pH increase, kg NV/ha		230	
Max. irrigation recommendation, mm		36	(pF 3.3 - pF 2.0)
Fungi/Bacteria ratio			

This soil is dominant in bacteria. This results in rapid organic matter breakdown and dynamic nutrient mineralization. To increase the fungi/bacteria ratio, add complex organic materials with a high C/N ratio like straw, compost and solid manure. Implement conservation practices like reduced tillage to promote the fungal community.

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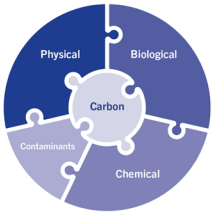

3. Soil Organic Carbon Balance

Current soil carbon status:	**79969**	kg C per hectare	= 293.5	ton CO_2 per hectare
Output: expected breakdown (mineralisation)	**1839**	kg C per hectare	= 6.7	ton CO_2 per hectare
Input: Needed to maintain soil organic carbon status	**1839**	kg C per hectare	= 6.7	ton CO_2 per hectare
Input: Additional input needed to improve by 4 per 1000	**320**	kg C per hectare	= 1.2	ton CO_2 per hectare
Total required carbon input	**2159**	kg C per hectare	= 7.9	ton CO_2 per hectare

Scan QR-code or follow hyperlink (email) to optimize your personal carbon management

Risk of P-leaching

P-binding capacity, kg/ha	3200
P-saturation, %	51

* = indicative value

Methods

Contact Eurofins: