

FertilizationManager

field 4 pasture

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Example report
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Analysis Investigation/ordernr: 700444/003709396 Date sampling: 01-11-2023 Date report: 14-11-2023

Results	Unit	Result	Target value	low	rath.low	good	rath.high	high
Chemical	Total N stock	kg N/ha	2420	2870 - 4310				
	C/N ratio		17	13 - 17				
	N-supplying capacity	kg N/ha	125	95 - 145				
	S-plant available	kg S/ha	19	20 - 30				
	Total S stock	kg S/ha	775	630 - 1170				
	C/S ratio		54	50 - 75				
	S-supplying capacity	kg S/ha	14	20 - 30				
	P-plant available	kg P/ha	1,6	1,6 - 2,6				
	P-soil stock	kg P/ha	165	135 - 170				
	K-plant available	kg K/ha	60	60 - 95				
	K-soil stock	kg K/ha	190	160 - 265				
	Ca-plant available	kg Ca/ha	145	65 - 145				
	Ca-soil stock	kg Ca/ha	4125	3425 - 4360				
	Mg-plant available	kg Mg/ha	270	60 - 95				
	Mg-soil stock	kg Mg/ha	170	205 - 345				
Physical	Na-plant available	kg Na/ha	31	13 - 26				
	Na-soil stock	kg Na/ha	26	28 - 46				
	Si-plant available	g Si/ha	4750	5230 - 22670				
	Fe-plant available	g Fe/ha	1650	2180 - 3920				
	Zn-plant available	g Zn/ha	110	440 - 650				
	Mn-plant available	g Mn/ha	1480	2790 - 4360				
	Cu-plant available	g Cu/ha	50	35 - 55				
	Co-plant available	g Co/ha	5	5 - 5				
	B-plant available	g B/ha	45	140 - 190				
	Mo-plant available	g Mo/ha	4110	90 - 4360				
	Se-plant available	g Se/ha	3,5	3,1 - 3,9				
	Acidity (pH)		5,7	> 5,8				
	C-organic	%	4,80					
	Organic matter	%	10,3					
	SOC/SOM ratio		0,47	0,45 - 0,55				
	Carbonate lime	%	0,7	2,0 - 3,0				
	Clay (<2 µm)	%	16					
	Silt (2-50 µm)	%	34					
	Sand (>50 µm)	%	39					
	<16 µm	%	26					
	Clay-humus (CEC)	mmol+/kg	259	> 237				
	CEC-saturation	%	100	> 95				
	Ca-saturation	%	91	80 - 90				
	Mg-saturation	%	6,2	6,0 - 10				
	K-saturation	%	2,2	2,0 - 4,0				
	Na-saturation	%	0,5	1,0 - 1,5				
	H-saturation	%	< 0,1	< 1,0				
	Al-saturation	%	< 0,1	< 1,0				

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Results	Unit	Result	Target value	low	rath.low	good	very good		
	Soil crumbling	score	8,3	6,0 - 8,0					
	Soil slaking	score	7,2	6,0 - 8,0					
	Risk on wind erosion	score	8,6	6,0 - 8,0					
Biological	Unit	Result	Target value	low	rath.low	good	rath.high	high	
	Moisture retention cap.	mm	22						
	Microbial biomass	mg C/kg	252	515 - 1545					
	Microbial activity	mg N/kg	117	56 - 93					
	Fungal/bacterial ratio		0,8	0,6 - 0,9					

Fertilisation recommendations

The result is compared with an agricultural target value and is categorized as low, rather low, good, rather high high. This is not an appreciation as meant in ISO 17025 (par. 7.8.6).

Legislation

The fertilisation recommendations aim to achieve an agronomical optimum yield and crop quality. The recommendations do not take any legal restrictions into consideration.

Recommendat. Crop: Grass

Recommend. Recommend. Unit

Soil-based recommendation (for the coming 4 years)

Phosphate (P ₂ O ₅)	0	kg/ha	When recommendations are high, it is adviced to split the amount during the 4 years, for instance supply half the amount biannially. The soil based recommendation is meant to level the soil stocks of phosphorus, potassium, calcium and magnesium to the required amounts.
Potassium (K ₂ O)	65	kg/ha	
Calcium (CaO)	0	kg/ha	
Magnesium (MgO)	80	kg/ha	The lime gift is based on an optimal pH of 6,1 For every tenth increase in pH a lime gift is required of 230 kg/ha.
Lime (nw)	925	kg/ha	
Effective OM	0	kg/ha	The amount of effective organic matter needed is calculatated for a 4 year period. At the organic matter balance the yearly application of organic matter is calculated.

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Recommend.	Situation	1st cut	2nd cut	Additional cuts	
Crop-based recommendation (annual)					
in kg/ha	Nitrogen (N)	unlimited grazing	65	15	5
		limited grazing	80	35	15
		light mowing	90	55	20
		regular mowing	100	75	30
	Sulphate (SO ₃)		40	20	
	Phosphate (P ₂ O ₅)	unlimited grazing	30	10	0
		limited grazing	30	15	0
		light mowing	30	15	10
		regular mowing	30	20	15
	Potassium (K ₂ O)	unlimited grazing	25	10	0
	limited grazing	25	60	0	
	light mowing	65	45	35	
	regular mowing	105	70	50	
Calcium (CaO)		50	50		
Magnesium (MgO)		10	10		
Sodium (Na ₂ O)		20	20		
Copper (Cu)		0			
Cobalt (Co)		0			
Selenium (Se)		3			
in g/ha					

Crop based recommendation

The crop-based recommendation is based upon the crop needs, average yields and climatic conditions and is corrected for soil nutrient stocks and the soil supplying capacity. During the growing season the SoilCropMonitor can be used for fertilization adjustments.

For continuous grazing use the recommendation for unlimited grazing.

With light mowing we assume a yield of maximum 2500 kg dm/ha; for regular mowing we assume a yield of minimum 3000 kg dm/ha. The regular mowing recommendation is based upon a maximum of 5 cuts; the light mowing recommendation is based upon more cuts.

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Explanation

The results and/or the recommendations of this analysis are valid until 2027

For more information please use the following link:

<https://www.eurofins-agro.com/en/soil-analysis-explanation>

The soil based recommendation aims to maintain the soil nutrient stocks. The K, Ca and Mg recommendation will optimize the balance at the cation-exchange-capacity (CEC). It is advised to spread the soil based recommendation for nutrients and lime application across a 4 year period. When you have applied the soil based recommendation a new soil based analysis can be used to update the concentration of the nutrient stocks.

The crop based fertilization will feed the crop and improve its quality. Due to higher/lower yields and possible losses (e.g leaching) the amount of plant available nutrients can fluctuate. Therefore, we advise you to carry out a crop based analysis (Culture analysis) to determine the actual amount of available nutrients and to update the fertilization recommendations.

Look carefully at the appreciation of the nutrients on page 1. If the target values indicate that one or more nutrient quantities are very low, consult your advisor to level these quantities.

Nitrogen:

The N-recommendation by cut is based on an expected yearly dose of: 275 kg N/ha.

Sulphur:

Sulphur (S) is released by the degradation (mineralisation) of organic matter or manure. This mineralisation is performed by soil organisms. Soil organisms are not very active under colder conditions, which means not much S is released from the soil early in the spring. Therefore, it is sensible to fertilise with S for many early crops, even if the soil content is good or high.

Phosphate:

P-supplying capacity is 24 . The target range is 17 - 27

The P-buffering capacity indicates whether the P-soil stock is high enough to maintain the level of plant available P. When the buffering capacity (buffering power) is low, the plant available P will not remain on level during the growing season: it will decrease.

Potassium:**Calcium:**

Fertilization with calcium may benefit the soil structure.

Lime:

Give the lime prior to the most lime needing crop.

Note: with liming calcium and magnesium can be added.

Magnesium:

You can reduce the magnesium soil based recommendation with the amount of magnesium applied with the lime.

Soil life:

The biological soil fertility is measured by 3 characteristics, the microbial biomass, the microbial activity, and the fungal/bacterial ratio.

The acknowledgement of the measured results is based upon the amount of organic matter. There is not a recommendation given for the measured characteristics. On the basis of research projects there will be more information available.

Organic matter Figure: Organic matter balance

Yearly breakdown rate (percentage) of the total organic matter content (%): 2,3

- Stock of organic matter which will remain after 1 year in the sampled layer if no (effective) organic matter is supplied.
- Total required supply of effective organic matter as a result of the degradation of the organic matter.
- Supply of organic matter through grass.
- Net increase of effective organic matter.

For increasing the soil organic matter content by 0.1%: 870 kg effective organic matter per hectare is needed.

Figure: Quality of the organic matter

Organic matter consists primarily of C, N, P, S. If the organic matter contains relatively high amounts of N and/or S, this makes it attractive to soil organisms. Soil organisms happily eat this organic matter. N and S are released in the process and the amount of organic matter decreases slightly (dynamic organic matter). Organic matter can also contain a lot of C. This is generally less attractive to soil organisms (bacteria). As a result, the organic matter is not consumed as quickly by the soil organisms; making the organic matter more stable. Stable organic matter contributes - among other factors - to the workability of the soil and the looseness. Dynamic organic matter contributes primarily to the release of N and S and is therefore a source of these nutrients for the crop. The quality of the organic matter can be changed (gradually) by paying attention to the properties of soil improvers such as animal manure, compost and crop residues.

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Total number of pages: 6

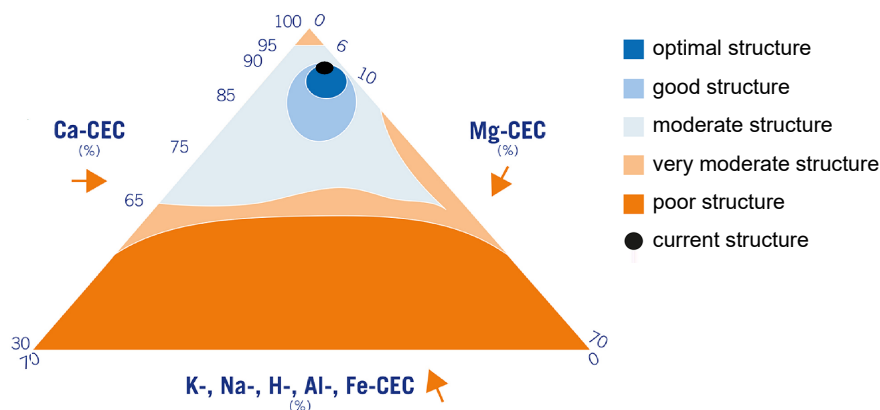
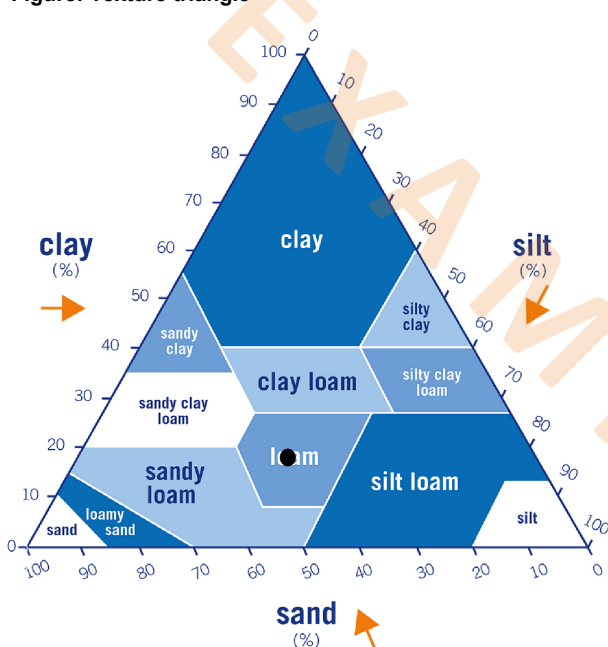
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700444/003709396, 26-07-2023

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Physical

The assessment of soil structure is based on the Ca-CEC, K-CEC, and Mg-CEC ratio. Actual soil structure is - of course - not merely depending on ratio, but also on weather conditions, moisture condition of the soil, and the weight of the machinery.

Figure: Structure triangle**Figure: Texture triangle**

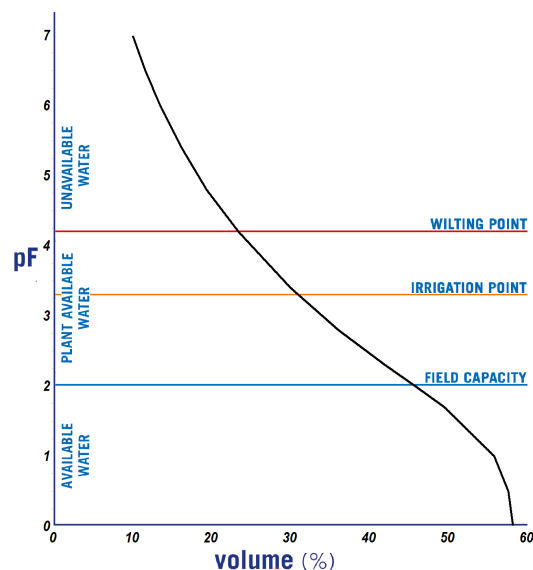
Besides clay, the silt and sand fractions are presented as well. Clay is smaller than 2 micrometer (μm), silt particles are 2-50 μm and sand particles are larger than 50 μm . The relative distribution of soil particles is used to estimate the risk of slaking. Slaking causes the soil pores to be clogged with smaller particles and degrades soil structure. The risk of slaking is greatest at 10-20% clay.

Soil crumbling score is: good, however the evaluation of soil crumbling status is also depending on crop type. Considering the results, the chance of soil slaking is small.

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Physical

Figure: Water retention curve



The amount of plant available water in the sampled layer is 22 mm. This is the maximum amount you should irrigate. All excess irrigation will drain off the parcel or will sink to deeper layers.

Field capacity (pF 2,0): 45,9 % moisture
 Irrigation point (pF 3,3): 31,0 % moisture
 Wilting point (pF 4,2): 23,5 % moisture

Crops have difficulties to obtain water when the actual moisture level is below pF 3,3. When you are able to measure the moisture level, start with irrigation if the moisture content of the parcel is at 31,0 % and irrigate 15 mm.

The actual moisture level can be measured by using a soil moisture sensor, or collect soil from ten spots in the parcel. Measure the weight of the moist soil and the weight after 24 h drying. The difference between moist and dry soil is an indication of the moisture level of the parcel.

Contact & info

Soil layer: 0 - 10 cm
 Sample was taken by: Eurofins Agro, Monsternemer
 Contact sample taking: Klantenservice Agro: 0888761010
 Sampling method: W-pattern, at least 40 sub samples, according to Eurofins Agro standard MIN 1000

If the following information is shown in the reports, this information may have been provided by the client and may affect the valuation, advice and/or analysis result:
 sampling depth, crop, culture.

Method	Result	Unit	Method	RvA
Results	Total nitrogen stock	2780	mg N/kg	Em: NIRS
analyses	S-plant available	22,0	mg S/kg	Em: CCL3 (Gw NEN 17294-2)
	Total sulphur stock	890	mg S/kg	Em: NIRS
	P-plant available	1,8	mg P/kg	Em: CCL3 (Gw NEN 15923-1)
	P-soil stock	44	mg P ₂ O ₅ /100 g	PAL1: Gw NEN 5793
	P-soil stock	19	mg P/100 g	PAL1: Gw NEN 5793
	K-plant available	69	mg K/kg	Em: CCL3 (Gw NEN 17294-2)
	K-soil stock	5,6	mmol+/kg	Em: NIRS
	Ca-plant available	2,1	mmol Ca/l	Em: NIRS
	Ca-soil stock	237	mmol+/kg	Em: NIRS
	Mg-plant available	309	mg Mg/kg	Em: CCL3 (Gw NEN 17294-2)
	Mg-soil stock	16,1	mmol+/kg	Em: NIRS
	Na-plant available	36	mg Na/kg	Em: CCL3 (Gw NEN 17294-2)
	Na-soil stock	1,3	mmol+/kg	Em: NIRS
	Si-plant available	5450	µg Si/kg	Em: CCL3 (Gw NEN 17294-2)
	Fe-plant available	1890	µg Fe/kg	Em: CCL3 (Gw NEN 17294-2)
	Zn-plant available	130	µg Zn/kg	Em: CCL3 (Gw NEN 17294-2)
	Mn-plant available	1700	µg Mn/kg	Em: CCL3 (Gw NEN 17294-2)
	Cu-plant available	55	µg Cu/kg	Em: CCL3 (Gw NEN 17294-2)
	Co-plant available	6,9	µg Co/kg	Em: CCL3 (Gw NEN 17294-2)
	B-plant available	49	µg B/kg	Em: CCL3 (Gw NEN 17294-2)
	Mo-plant available	4710	µg Mo/kg	Em: CCL3 (Gw NEN 17294-2)
	Se-plant available	4,0	µg Se/kg	Em: CCL3 (Gw NEN 17294-2)
	Acidity (pH)	5,7		Em: NIRS
	C-organic	4,80	%	Em: NIRS
	Organic matter	10,3	%	Em: NIRS
	C-inorganic	0,09	%	Em: NIRS
	Carbonate lime	0,7	%	Em: NIRS
	Clay (<2 µm)	16	%	Em: NIRS
	Silt (2-50 µm)	34	%	Em: NIRS
	Sand (>50 µm)	39	%	Em: NIRS
	Clay-humus (CEC)	259	mmol+/kg	Em: NIRS
	Microbial biomass	252	mg C/kg	Em: NIRS
	Microbial activity	117	mg N/kg	Em: NIRS
	Fungal biomass	104	mg C/kg	Em: NIRS
	Bacterial biomass	138	mg C/kg	Em: NIRS
	Bulk density	872	kg/m ³	Em: NIRS

The values stated on page 1 and 2 under 'Result' are calculated from the above mentioned analysis results.

Q Method accredited by RvA

Em: Method Eurofins Agro, Gw: Equivalent of, Cf: In conformity with

Results are reported in dry soil.

The analyses were done at Eurofins Agro, Wageningen (NL).

The results relate exclusively to the sample taken and received by Eurofins Agro, and to the material processed on 02-11-2023, and therefore to the sample analysed. For a detailed description of the sampling and analysis methods used, visit www.eurofins-agro.com