

NORTH WEST DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT AGRICULTURAL SUPPORT SERVICES

“ Soil Analysis Report and Interpretation”

Date: 20.09.2022

Venue: Tlaskgameng Library

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**Agriculture &
Rural Development**
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OVERVIEW

- ❖ Introduction
- ❖ Purpose of soil analysis
- ❖ Soil pH values
- ❖ Interpretation of different elements using different methods
 - Phosphorus
 - Potassium
 - Magnesium
 - Calcium
 - Zinc
- ❖ Conclusion

Soil Analysis

- Soil test refers to one or more of a wide variety of soil analysis conducted for one or several reasons.
- Most widely conducted soil tests:
 - To estimate the plant-available concentrations of plant nutrients, in order to determine the fertilizer recommendations.
- A soil analysis is used to determine the level of nutrients in a soil sample and it can only be as accurate as the sample taken at a particular field.



Purpose of soil analysis



Identify and correct soil acidity

Identify and correct soil salinity

Identify and correct nutrient deficiencies

Identify and correct element toxicity

Formulate an economic fertilization program.

nb: Yield potential of soil cannot be identified with analysis of a sample because factors like soil depth and structure can only be identified by a soil survey.

Soil pH values



0 -3.5 – Very Acidic

3.6 -6.5 – Slightly Acidic

6.6 -7.5 – Neutral

7.6 -10.5 – Slightly Alkaline

10.6 -14 – Very Alkaline

Very acidic soils: apply lime

Very alkaline soils: apply sulphur

Availability of most nutrients is influenced by pH e.g. acidic soils will lead to aluminum

and manganese toxicity and calcium, phosphorus and magnesium will be less available.

In highly alkaline soils, phosphorus and most micronutrients become less available.









Available laboratories for soil analysis

- Different laboratories that analyse soil samples
- The price of the soil sample differs from laboratory to laboratory and it depends on package of analysis e.g. Standard or analysis of heavy metals
- Agricultural colleges – CEDARA & Madzivhandila, Tompi Seleka
- Universities – UKZN, NWU & Stellenbosch etc!
- Various private laboratories



Important soil properties that are analysed

❖ Chemical Properties

- Electrical conductivity: electrical conductivity method
- Soil pH: Electrode pH meter method
- Nutrient status – Phosphorus, Potassium, Sodium, Magnesium, & Calcium etc! using different analytical methods
- Exchangeable acidity: calorimetric or titration method



Important soil properties for analysis

❖ Physical Properties

- Soil colour: Munsell colour chart
- Soil texture: Feel method, pipette method or hydrometer method
- Bulk density: Core ring sample method
- Moisture content: Gravimetric method etc!

❖ Biological Properties

- Abundance of organisms
- Diversity of organisms
- Density of organisms etc!!



Example of soil analysis results of chemical properties

[Nutrient status (mg/kg) and soil pH]

Sample No	Ca	Mg	Na	K	P	pH (KCl)
1	4164.0	1658.0	137.5	69.0	69.0	7.1
2	898.5	201.0	43.0	10.0	10.0	4.55

Interpretation of soil analysis results

- Gives meaning to the analysed results
- Done by comparing analysed results with standard figures/normal ranges and/or certain norms
- Figures interpreted depends on parameter analysed e.g. Soil pH and Phosphorus



Interpretation of soil analysis results using various chemical elements

Example: Soil pH values

- 0-3.5 – Very Acidic
- 3.6-6.5 – Slightly Acidic
- 6.6-7.5 – Neutral
- 7.6-10.5– Slightly Alkaline
- 10.6-14– Very Alkaline



Very acidic soils: apply lime (calcitic or dolomitic liming materials) or wood ashes

Very alkaline soils: apply sulphur & ammonium based fertilizers

Availability of most nutrients is influenced by pH e.g. acidic soils will lead to aluminum and manganese toxicity and calcium, phosphorus and magnesium will be less available. In highly alkaline soils, phosphorus and most micronutrients become less available.



Interpretation of different elements using different methods

- Phosphorus (P) (mg/kg or ppm)

Method				Interpretation	
Bray 1	Bray 2	Ambic	Olsen		
0-10	0-13	0-8	0-6	Very low	
10-17	13-22	8-13	6-10	Low	
17-24	22-31	13-20	10-14	Medium	
24-31	31-40	20-26	14-18	High	
>31	>40	>26	>18	Very high	

Potassium (K) mg/kg or ppm

Value	Interpretation
<45	Very low
45-60	Low
60-80	Medium
80-110	High
>110	Very high

Magnesium (Mg) mg/kg or ppm

Value	Interpretation
>30	Very low
30-45	Low
45-70	Medium
70-90	High
>90	Very high

Calcium (Ca) mg/kg or ppm

Value	Interpretation
<150	Very low
150-200	Low
200-250	Medium
250-300	High
>300	Very high

Zinc (Zn) mg/kg or ppm

Value	Interpretation
<1	Very low
1-2	Low
2-4	Medium
4-6	High
>6	Very high

Conclusion

- Soil analysis is an important tool for the farm as it determines the inputs required for efficient and economic production.
- A proper soil test will help ensure the application of enough fertilizer to meet the requirements of the crop while taking advantage of the nutrients already present in the soil



- To make the best fertilizer applications on your yields, consult with your agronomist or soil fertility specialist.
- Although no soil analysis is perfect, the information and insight from soil test can help to improve the nutrient efficiency, diagnose in-season plant deficiencies and ultimately prevent unnecessary yield loss.





The image features a vibrant blue background with several yellow, speech-bubble-shaped cutouts made of a textured material like cardstock. One central bubble is in sharp focus, displaying the words "THANK YOU" in a clean, white, sans-serif font. The text is arranged in two lines: "THANK" on top and "YOU" below it. This central bubble is part of a stack, with the edges of multiple other identical bubbles visible beneath it. Other yellow bubbles are scattered in the background, some partially cut off by the frame, creating a sense of depth and repetition. The lighting is even, highlighting the texture of the paper and the bright colors.