

# **NORTH WEST DEPARTMENT OF AGRICULTURE AND RURAL DEVELOPMENT AGRICULTURAL SUPPORT SERVICES**

## **“ Soil Analysis Report and Interpretation”**

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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.

















# 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 Sheleka
- 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	<b>Very low</b>
150-200	<b>Low</b>
200-250	Medium
250-300	High
>300	Very high

## Zinc (Zn) mg/kg or ppm

Value	Interpretation
<1	<b>Very low</b>
1-2	<b>Low</b>
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.











*THANK  
YOU*