

NORTH WEST DEPARTMENT OF
AGRICULTURE AND RURAL DEVELOPMENT
AGRICULTURAL SUPPORT SERVICES

SOIL SAMPLING

Godfrey Naane

Tel. +27(0)18 299 6663

Email: gnaane@nwpg.gov.za



**Agriculture &
Rural Development**
Department:
Agriculture and Rural Development
North West Provincial Government
REPUBLIC OF SOUTH AFRICA



The Process of Soil Sampling involves 4 Questions

What

Why

How

When to take soil samples



What is Soil Sampling

This is a representative portion of soil obtained on a specific field. It is done :

- to estimate the nutrients needed for economically profitable crop production.**
- to gain an understanding of nutrient variability within a field.**



PURPOSE OF SOIL SAMPLING & TESTING

- 1. To collect a soil sample that is representative of a field or portion of a field**
- 2. To obtain information about a field and use that information to make management decisions**
 - 2.1 Nutrient management – determine the nutrient or fertility status of the soil.**



PURPOSE OF SOIL SAMPLING & TESTING – cont...

2.1.1 Deficiency - older leaves become chlorotic, dark necrotic spots.

- insufficient chlorophyll. They soon die.**

2.1.2 Toxicity

- high concentration of plant nutrients in the soil.**

- nutrients absorbed excessively by plants.**

2.1.3 Imbalances -affect plant growth and health



PURPOSE Cont...

3. To determine the pH of soil

3.1 A measure of acidity and alkalinity.

- to make informative analysis for quantitative and qualitative chemical characteristics

3.2 Acid soils – pH below 7

3.3 Alkaline soils – pH above 7



WHEN AND WHERE (**Not Allowed**) TO TAKE A SOIL SAMPLE

- ❑ **Before planting or after harvesting**
- ❑ **Sampling on frozen ground is not recommended**
- ❑ **Taking samples on pathways is also NOT recommended**



WHEN AND WHERE TO TAKE A SOIL SAMPLE Cont...

- Dead furrows or back furrows**
- Lime, sludge, or manure piles**
- Near fences or roads**
- Rows where fertilizer has been banded**
- Eroded knolls/ low spots**



TOOLS NEEDED TO TAKE A SOIL SAMPLE

- Soil Auger or spade**
 - Bucket/Clean plastic or paper bag**
 - Sack- for mixing samples**
 - Labels and marking pen**
-
- Additional info. : history of the land and name of the farm/field or portion**



HOW TO TAKE A SOIL SAMPLE

1. Sampling depth – 0-30 cm and 30-60 cm

2. Sample Size

One kg soil sample. Place in a bucket/sack & mix thoroughly

3. Place in sample box

Fill out info. on box & paperwork



HOW TO TAKE A SOIL SAMPLE - cont...



HOW TO TAKE A SOIL SAMPLE (METHODS) - cont...

2. Zone

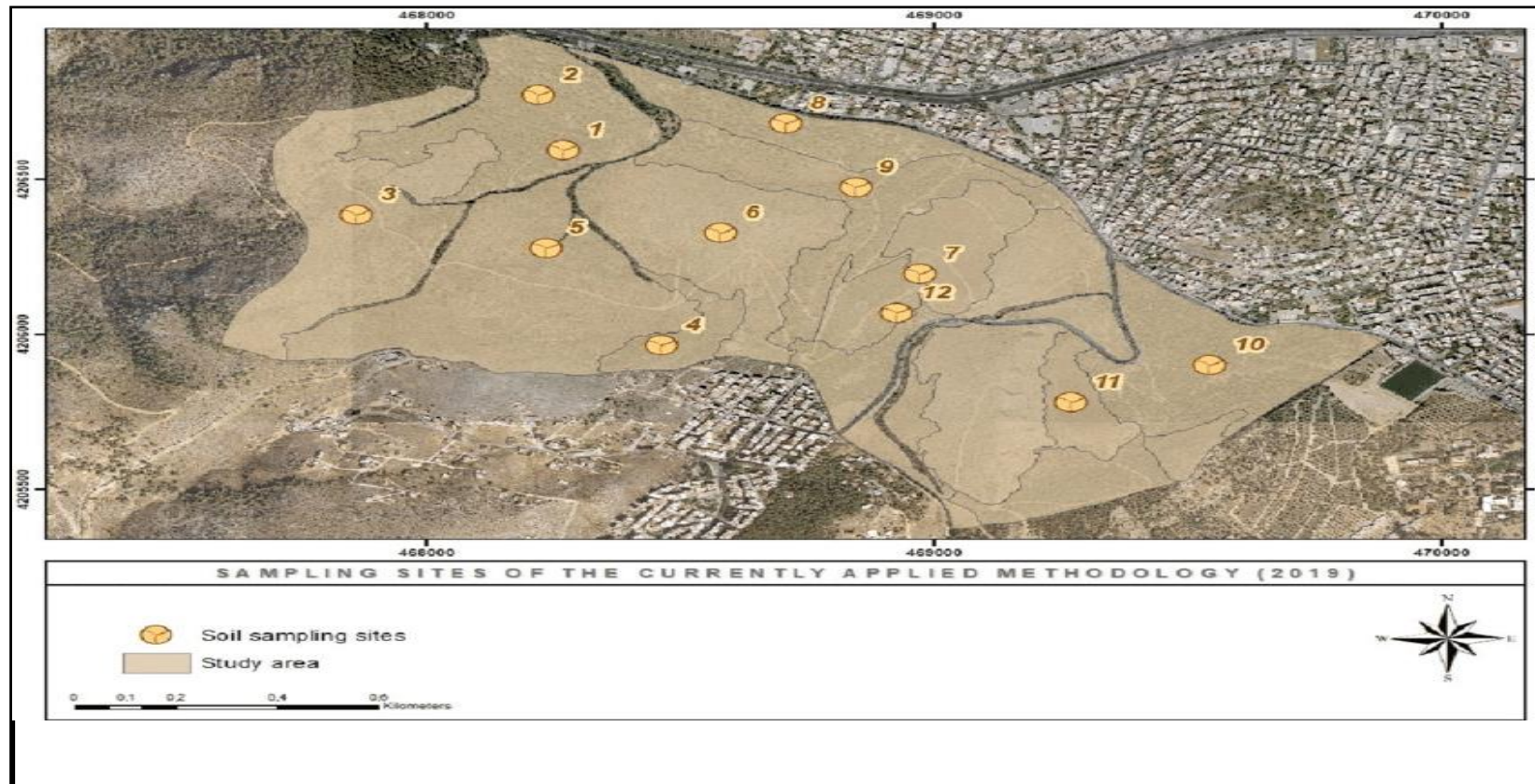
Zone delineation – based on knowledge of the field

- **Soil and/or yield maps**
- **Topography/elevation map**
- **Past history**
- **Nutrient maps from previous grid sampling**



HOW TO TAKE A SOIL SAMPLE (METHODS) - cont...

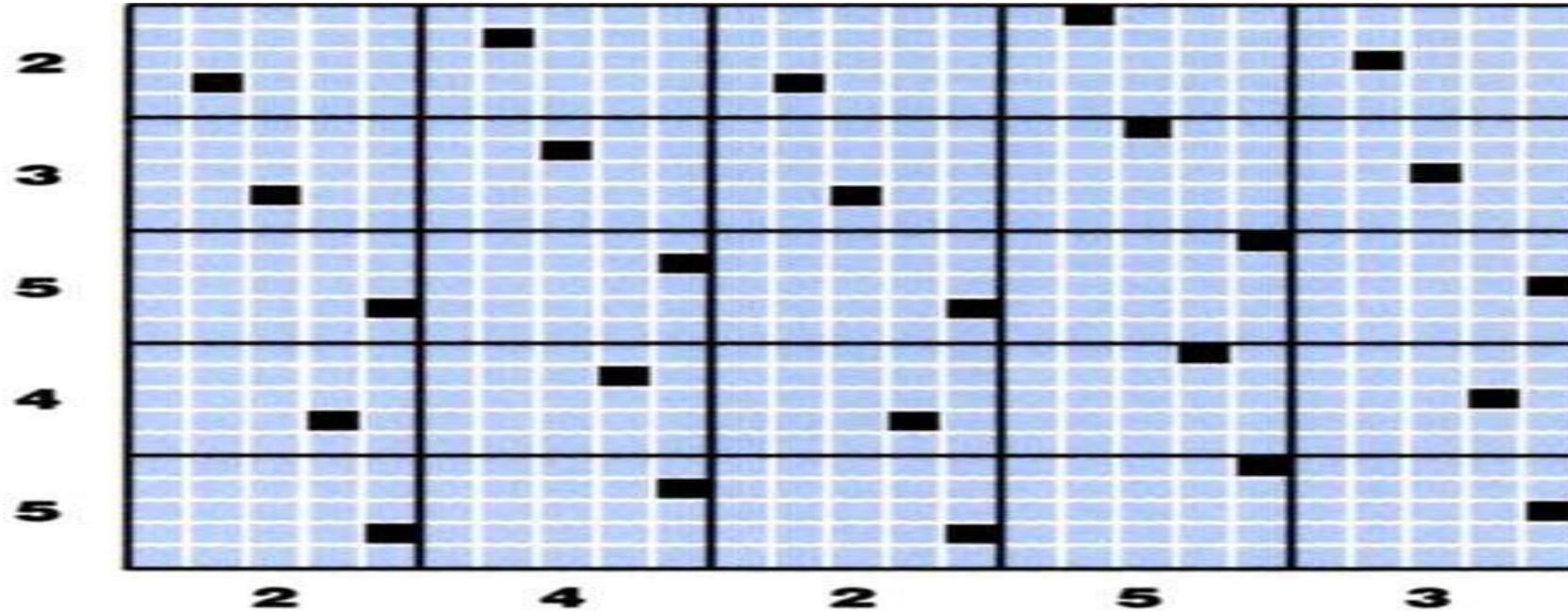
Zone



HOW TO TAKE A SOIL SAMPLE (METHODS) - cont...

3. Grid pattern

- Sample locations have GPS coordinates



Here are some of the latest instruments used for soil sampling : The pH Meter



The Salinity Meter

Conductivity/TDS/Salinity Meter



The Soil Analyzer – Combi +

Soil analyzer PNT 3000 Combi+

- water
- nutrient solution
- soil fertility



**Agriculture &
Rural Development**

Department:
Agriculture and Rural Development
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

The Handheld XRF Analyzer – MET 8000



The Handheld XRF Analyzer – In action (Mg, Al, Si, P, S and Cl)

X-MET8000
GEO

HITACHI
Inspire the Next



**Agriculture &
Rural Development**
Department:
Agriculture and Rural Development
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

CONCLUSION

- ❑ **Soil sampling is an inexpensive (cheaper) practice to learn about ability soil to support crop growth.**
- ❑ **With the knowledge of what each test/analysis means, growers can make more informed crop input-decision to minimize risk and maximize profit.**

