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SOIL SAMPLING IN OIL PALM PLANTATIONS

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Soil sampling in oil palm plantations

The prime objective of oil palm growing farmers is to get higher fresh fruit bunch yield coupled with higher net income by adopting efficient cultivation practices including fertilizer application. One of the effective methods to determine plant nutritional status for suitable fertilizer application programme is soil analysis. The soil analysis programme consists of collection of representative soil sample, determination of nutrient status therein and other parameters, calibration and interpretation of analytical results and making fertilizer recommendations. The success of the programme depends upon the operative precision at all stages. The main objective of soil analysis programme is to assist annual fertilizer application programme by assessing nutrient deficiencies and imbalances, if any.

Soil sampling is done to assess soil properties like soil reaction (pH), electrical conductivity (EC), organic carbon (OC) content and available nutrients like nitrogen (N), phosphorus (P), potassium (K), calcium (Ca), magnesium (Mg), zinc (Zn), copper (Cu), iron (Fe), manganese (Mn) and boron (B) in soil. Other tests may be carried out depending upon the specific requirement.

Sampling density and frequency

Samples must accurately reflect the fertility of the soil/land so that analysis, interpretation and recommendations takes care of the nutrient status of the entire field. Larger areas may be divided into appropriate number of smaller homogenous units for better representation. Criteria like similar yield, similar soil type and drainage, same planting date, same planting material and similar topography may be used for deciding sampling units. Fields with significant landscape or other differences should be divided into separate sampling areas. Differences may include soil type, slope, degree of erosion, drainage, crop and/or manure history or other factors that may influence soil nutrient levels. Sampling density of 1% is recommended for a homogenous sampling unit. Soil sampling may be done at 2 years interval for a particular plantation. Recently fertilized areas/palms, bunds, channels, marshy tracts and areas near trees, wells and compost pits must be avoided for sampling.

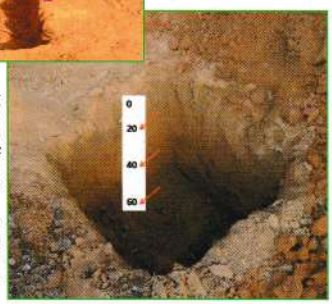
Time of sampling

Soil samples could be collected on any normal day. But the conditions associated with heavy rainfall/ irrigation and excessive dryness should be avoided. Soil samples can be taken 2 to 3 days after rainfall. Care should be taken to collect soil samples after 2 to 3 months of fertilizer application.

Method of sampling

It is generally advisable to collect composite soil samples from 0 to 20 cm, 20 to 40 cm and 40 to 60 cm depth from 3 points in oil palm basins at 1m away from the palm base. Both surface and subsurface soil samples are needed to test available nutrient status in root zone. A pit of 60 cm x 60 cm x 60 cm size is made and about 2 cm uniformly thick slice is taken out from one clean side. Before collection of soil sample, debris, dry grasses and other substances present on soil surface should be removed by scraping.

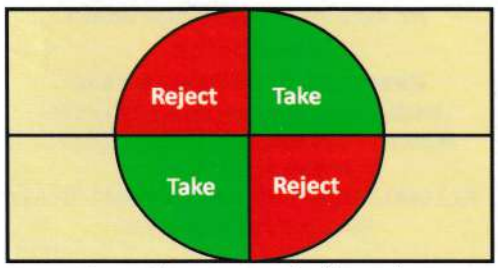
Soil sampling pit point (one metre away from palm base)



Digging pit (60 cmx60 cmx60 cm) and collection of 3 samples from the depth of 0 - 20 cm, 20 - 40 cm and 40 - 60 cm.

Amount of sample

Soil samples collected from 3 points at respective depths in each palm basin must be thoroughly mixed in a clean plastic container. The amount of sample is reduced to 500 g by quartering process. The sample is later placed in new polythene bag and marked properly for identification.



Quartering process of soil sampling

Sampling tools

Stainless steel soil sampling auger is commonly used for collecting soil samples under normal conditions. Other requirements include plastic bucket, shovel or spade, sample bags (preferably new polyethene bags) and marker pens. Tools should be clean, free of rust and stored away from fertilizer

materials. It is advisable not to use galvanized iron or brass equipments or any kind that will contaminate the samples with micronutrients.

Drying of samples

Moist soil samples must be air dried as soon as possible before being bagged and sent to a Soil Testing Laboratory. Drying is best accomplished by spreading each sample on clean polythene sheet to air dry at room temperature. Do not over dry the samples.

Sample labeling

Soil samples along with sample label are to be sent to the laboratory for analysis. Sample label must have the following information:

1. Name of the farmer
2. Address and phone no.
3. Date of sampling
4. Sampling depth
5. No. of samples collected per hectare
6. Palm no.
7. Past cropping history
8. Quantity and date of fertilizer last applied
9. Irrigation method and frequency
10. Last three years of fresh fruit bunch yield/ha

Precautions

Do's

- Use stainless steel or rust free auger for sampling.
- Store soil samples in clean, preferably new polyethene bags.
- Use glass or porcelain or polyethene jar for long duration storage.

Dont's

- Avoid contact of the soil samples with chemicals, fertilizers and manures.
- Do not use bags or boxes previously used for storing fertilizers, salt and other chemicals.

For more information, please contact

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