

# SOIL TESTING AND SAMPLING

- LAND & WATER RESOURCES MANAGEMENT  
PROGRAMME  
IAR&T

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# Soil testing

- Soil testing is an important element in nutrient management.
- Soil test results can be viewed in three categories:
- (1) **low or yes**, a fertilizer addition *will* likely increase growth and yield;
- (2) **high or no**, a fertilizer addition will *not* likely increase growth or yield; and
- (3) **intermediate or maybe**, a fertilizer addition *may* increase growth or yield.
- Categorization of soil test results into “yes,” “no,” and “maybe” assists understanding the limits and benefits of **using soil test results for making nutrient recommendations**

# Sampling methods

- Proper collection of soil samples is the most important step in nutrient/soil amendment management programme.
- Soil sampling should reflect:
  - ❖ Tillage
  - ❖ Past fertilizer/soil amendment placement
  - ❖ Cropping Patterns
  - ❖ Corresponding Irrigation requirements
  - ❖ Soil type (including drainage and slope characteristics)
  - ❖ Perhaps Old Field boundaries

# Why Soil Testing?

- Maximizing the use of fertilizers for optimal crop production can be achieved by intensive soil testing programmes
- To know appropriate level and kind of fertilizers for different soil types
- To increase response to fertilizer
- Suitability evaluation
- Sustainable increase in yield

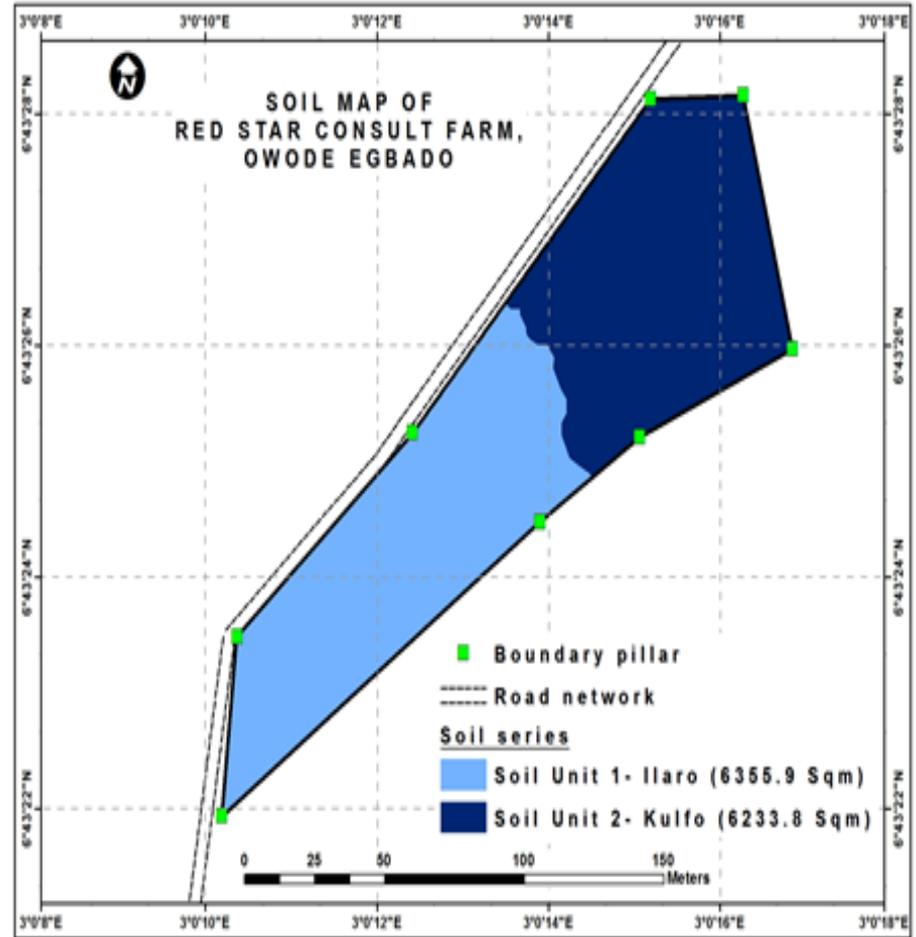
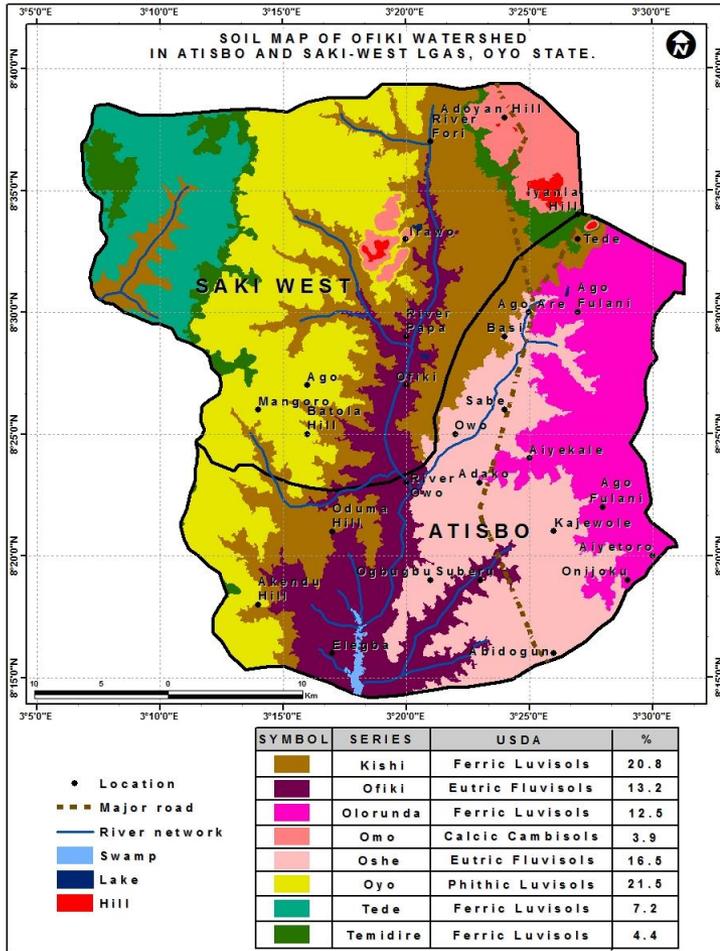
# Sampling methods

- The most commonly used method for soil sampling would be based on soil types.
- Fields are split into sampling areas that contain similar soils.
- Hillsides are kept separate from bottoms since the soil types will vary.
- Soil survey maps, if applicable, can help organize the soil types throughout the sampling area.
- Samples will not necessarily need to be collected for every soil type;
- however, similar soils should be kept together.
- Sampling maps can be kept to note the locations of the cores for subsequent sampling.

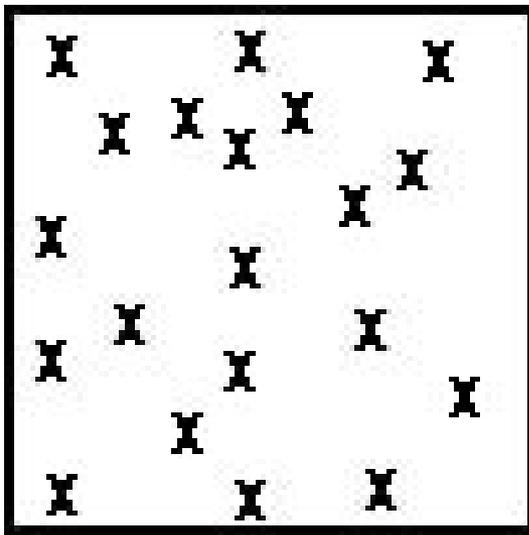
# Sampling methods

- The sampling area will be dependent on the soils and topography.
- Smaller sampling areas may be needed if the soils are quite variable or a production problem is apparent.
- Once the sampling area is determined, a sufficient number of cores should be taken to acquire a representative sample.
- This is generally 10 to 20 cores. The depth of sample for surface soils would be 0 to 20cm or as deep as the primary tillage.

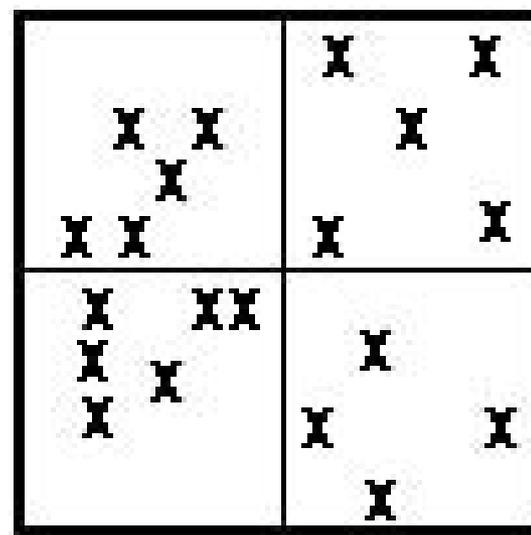
# Based on soil type



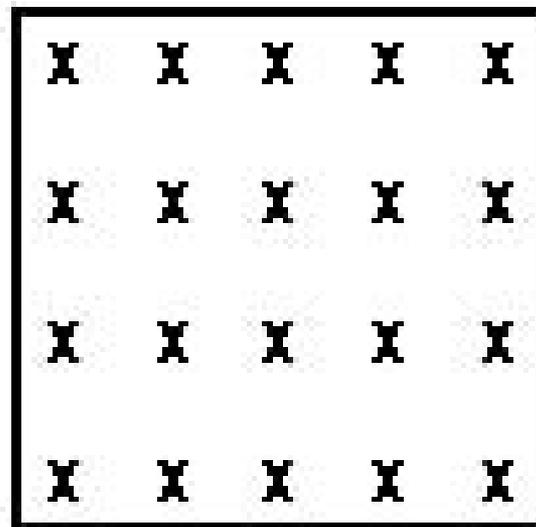
- ❖ ***SAMPLING TOOLS:*** Tools that can be used are a spade, soil probe or auger, cutlass,
- ❖ ***SAMPLING TECHNIQUES:*** There are four common techniques of sampling:
  - ❖ simple random
  - ❖ stratified random
  - ❖ systematic
  - ❖ and grid sampling methods.
- ❖ Uniform fields can be sampled by any of these methods:



**Simple Random**



**Stratified Random**



**Systematic**

# Proper Handling of Soil samples

- **PROPER HANDLING OF SOIL SAMPLES**
- Label correctly
- Air dry
- Avoid contamination of soil samples

# CONCLUSION

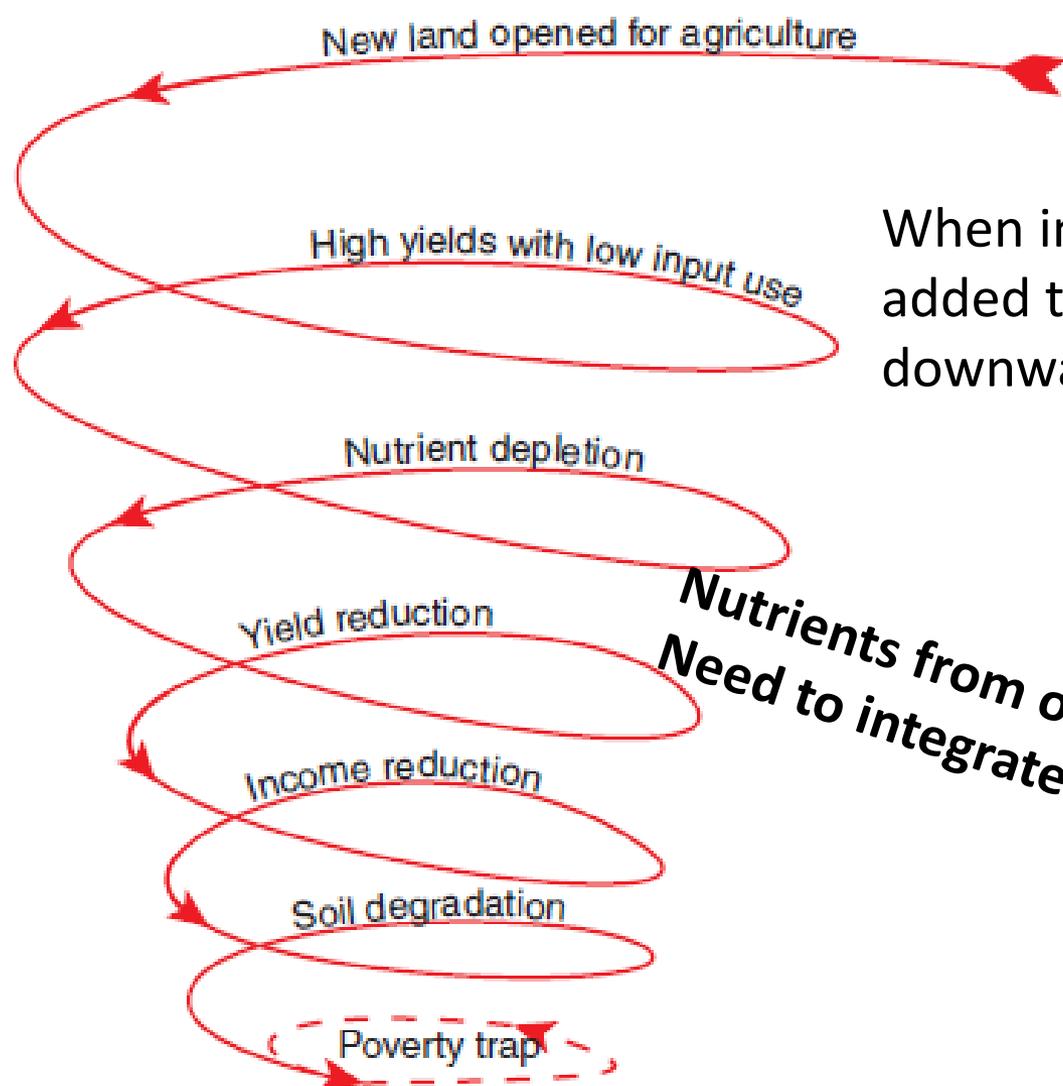
- Soil testing is a must to avoid crop failure and soil degradation
- The sustainability of any farming business lies on the reliability of soil samples collected for analysis.
- When there is an error in soil sampling, the business has started to fail from the beginning.
- Maximum benefits from inputs is only possible with good soil testing

# Principles of Integrated Soil Fertility Management (ISFM)



West Africa Soil Health Consortium  
Nigeria Soil Health Consortium  
(South)

*Introduction to ISFM as a concept*



When insufficient nutrients are added to maintain soil fertility: downward spiral into a **poverty trap**

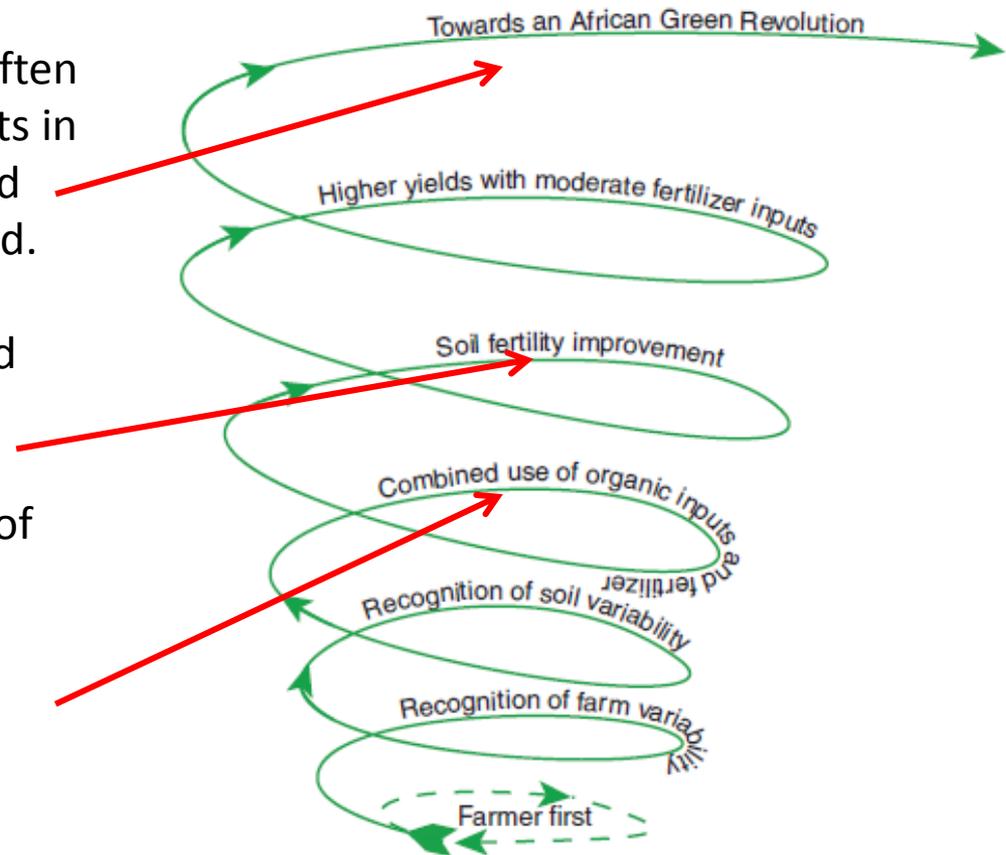
**Nutrients from outside the farm are needed!  
Need to integrate fertilizer and organic resources!**

# Exercise: From poverty traps towards an African Green Revolution?

Storing and marketing produce is often problematic so the foreseen impacts in terms of increased income and food security cannot be taken for granted.

It takes several years for a degraded soil to become productive and responsive again. How does the farmer finance the rehabilitation of his/her field?

availability of fertilizer and organic inputs



**ISFM is very important, but interventions in the political and economic environment are needed to make ISFM work!**

# Principles of Integrated Soil Fertility Management (ISFM)

- ❑ **COMPONENTS OF ISFM**
- ❑ **COMBINED USE OF ORGANIC AND INORGANIC**
- ❑ **IMPROVED CROP VARIETIES**
- ❑ **LOCAL ADAPTATIONS:SOIL VARIABILITIES, SLOPES**
- ❑ **SOUND AGRONOMIC PRACTICES**

*Introduction to ISFM as a concept*

ARE YOU CREATING WEALTH FROM  
SOILS?



• THANK YOU