

**“Preservation and collection ,physical and  
chemical analysis of soil”**

# SOIL IN FORENSIC SCIENCE

- Soil can provide important information to the criminal investigation as a transfer evidence.
- Earth material such as soils, rocks minerals, and particles from man-made materials such as bricks provide excellent evidence to link criminals to crime scene.
- Forensic soil scientists are also using advanced automated techniques, which have the ability to acquire information from smaller samples to make soil forensic an increasingly popular tool in criminal investigation.

# COLLECTION OF SOIL SAMPLE

Before any soil can be tested or analysed, it must be collected and then properly contained for preservation for later analysis.

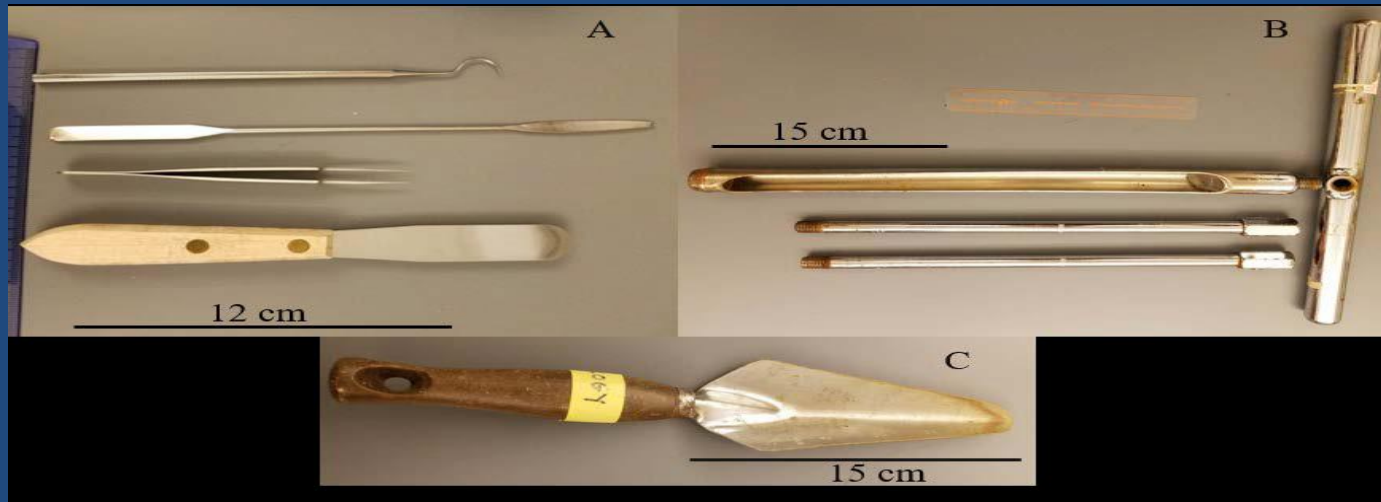
- Soil dried on a large hard surface, such as a vehicle, should be scraped off, while trying to preserve intact aggregates which may have layering.
- Swabbing technique is used for the collection of soil sample if it should be dried and placed in a size appropriate, sealable container.

## Contd....

- These are some tools used for collection of soil; spatula, spade, palette knife, spoon, tweezers, plastering trowel, microparticle vacuum, soil core.
- It's usually advised that such tools be made of stainless steel.
- Stainless steel tools are resistant to corrosion, scratching and are easily cleaned.

# Contd...

- This is important because through cleaning of stainless steel tools can minimize cross contamination.



# PRESERVATION

- Soil sample should be taken to forensic lab, unopened, immediately after collection.
- If this is not possible for any reason, they need to be placed into a dark, refrigerated storage space that has a temperature of about 2 degrees Celsius.
- Do not freeze the samples because freezing can destroy organic evidence found in the soil.

## Contd....

- Paper bags and paper envelopes may rip or leak soil during transport, particularly if the evidence is moist.
- Unlined metal can may rust, particularly when filled with moist soil. Plastic bags are discouraged for small quantities of soil due to particle adherence to bag sides, but may be used for larger samples.
- Glass containers should only be used if they are carefully padded for transport. Samples should be stored in rigid containers that can be sealed tightly

# SOIL ANALYSIS

## PHYSICAL ANALYSIS

Texture

Colour

Size and shape

Temperature of soil

Nature of soil

Pore shape

## CHEMICAL ANALYSIS

Density Gradient Method

Spectrophotometric Analysis

Chromatographic Analysis

Microorganism Test

TCP,ICP-MS,AFS(Atomic Force Spectroscopy)

GC,HPLC,Paper chromatography



# TURBIDITY TEST

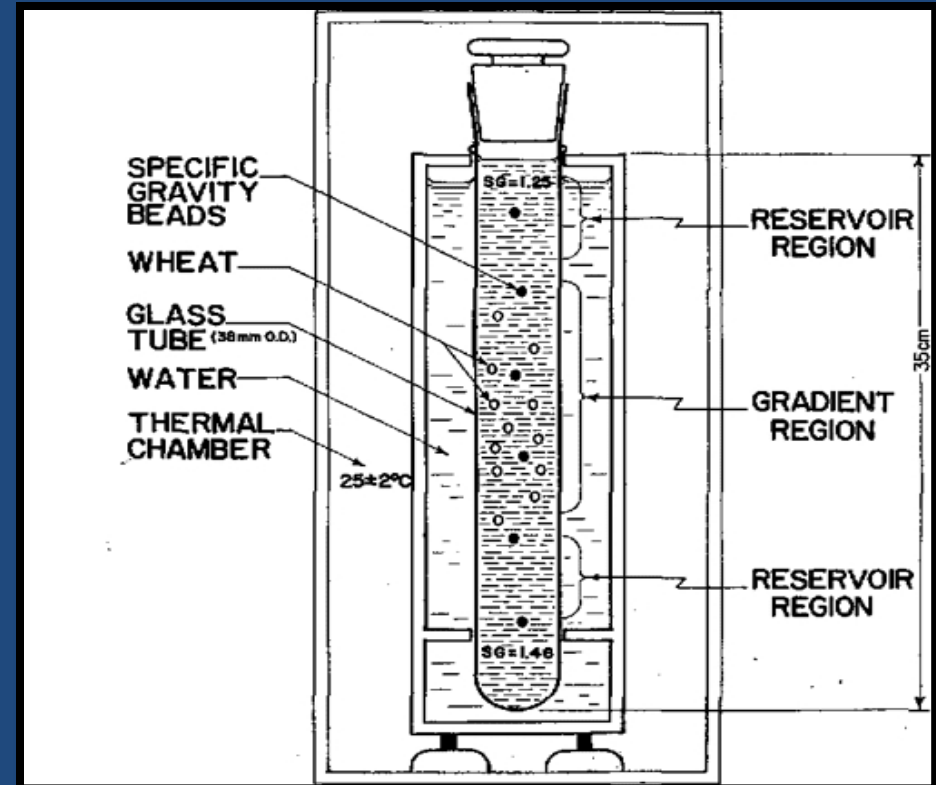
- Turbidity test is done by analyzing the particle present in a soil sample.
- Weigh a 1gm of soil sample i.e. questioned and control.
- Keep the soil sample in a test tube, then fill the  $\frac{3}{4}$  distilled water and cover the test tube with lead and cotton plug.
- Observe the suspensions in the sample, after the minute of interval & note the changes



# Density gradient test

- One way of examining the soil is the density gradient method.
- This apparatus is used for comparison of density of various types of physical evidences like soil, hair, fibers, cement etc.
- In this method, a cylinder is filled with various solution.
- Take two test tube (many of time 6-7 test tube) filled with two chemicals having different density i.e. they are immiscible.
- Generally BROMOFORM & BROMOBENZ is used.

# Density gradient column



THANK YOU....