

APPENDIX V.1

SOIL TEXTURE

(Ref: Soil Survey Manual, IARI, New Delhi, 1970, p.27)

(A) Basic Soil Textural Classes

General Terms	Soil Textural Class Names
1. Sandy soils: Coarse textured	Sand, Loamy sand
2. Loamy Soils: Moderately coarse textured	Sandy loam, Fine sandy loam
: Medium textured	Loam, Silt loam, Silt
: Moderately fine textured	Clay loam, Sandy clay loam Silty clay loam
3. Clayey Soils: Fine textured	Sandy clay, Silty clay, Clay

(B) International System for basic groups in Soils (Proposed by Atterberg)

Clay	Silt	Sand		Gravel
		Fine	Coarse	
0.002 mm and less	0.02 to 0.002 mm	0.2 to 0.02 mm	2.0 to 0.2 mm	More than 2 mm diameter (Not considered part of Soil)

APPENDIX V.2

DETERMINATION OF SOIL TEXTURE (FEEL METHOD)

(Ref: Soil Survey Manual, IARI, New Delhi, 1970 pp.28-29)

Textural Class	Feel of fingers	Ball formation	Stickness	Ribbon formation
Sand	Very gritty	Does not form ball	Does not stain fingers	No
Loamy Sand	Very gritty	Forms very easily broken balls	Very little, stains finger slightly	No
Sandy loam	Moderately gritty	Forms fairly firm ball but is easily broken	Definitely stains fingers	No
Loam	Neither very gritty nor very smooth	Forms firm ball	Definitely stains fingers	No
Silt loam	Smooth	Forms firm ball	Definitely stains fingers	Slight tendency to ribbon with flaky surface
Clay loam	Slightly gritty feel	Moderately hard ball when dry	Definitely stains the finger	Ribbon out on squeezing but it breaks easily
Silt clay loam	Very smooth	Moderately hard ball when dry	Definitely stains finger	Show some flaking on ribbon surface similar to silt loam
Clay	Very smooth	Forms hard ball, which when dry can not be crushed by finger	Definitely stains finger	Squeezes out at right moisture into long (1"-3") ribbons

APPENDIX V.3

Formulae used for calculations of various physical and Chemical properties of augerbore soil samples

1. Grain Size analysis:(a) Percentage of loss on weight in Soil

$$\text{Loss on weight \%} = \frac{W_1 - W_2}{W_1} \times 100$$

in which W_1 - Original weight of soil in gram

W_2 - Oven dry weight of soil in gram

(b) Percentages of sand, silt and clay fractions in Soil (By pipette method)

$$\text{(i) Percentage of Sand} = \frac{\text{Weight of Sand} + 4^*}{\text{Weight of oven dry soil after loss}} \times 100$$

$$\text{(ii) Percentage of Silt} = \frac{\text{Weight of Silt}}{\text{Weight of oven dry soil after loss}} \times 100$$

$$\text{(iii) Percentage of Clay} = \frac{\text{Weight of Clay} - 4^*}{\text{Weight of oven dry soil after loss}} \times 100$$

2. Available Water Holding Capacity

$$\text{AWHC (cm)} = \frac{\text{Thickness of soil textural class (cm)}}{\text{Relative constant for the class}}$$

*4 indicates that in 100 gm soil 4.0 gm 1N NaOH was required as a dispersing agent.

APPENDIX V.3 (contd.)

3. Permeability

$$K = \frac{QL}{Ath}$$

in which K = Permeability co-efficient at room temperature (cm/hr)

Q = Volume of water passed through soil (cc)

L = Thickness of soil column (cm)

A = Cross-sectional area of permeability tube (sq cm)

t = Time (hour)

h = Height of water level above the base of Soil column (cm)

4. Soil Reaction (pH) in 1:1 filtrate of Soil

pH = Dial reading of pH meter

5. Electrical Conductivity (EC) in 1:1 filtrate of Soil

$EC \times 10^3$ = Dial reading of electrical conductivity
(mmhos) meter x Cell constant

6. Percentage of total dissolved salts in 1:1 filtrate of Soil Sample:

Percentage of Salinity = $\frac{\text{Weight of salt present in 10 ml filtrate}}{\text{Weight of extract}} \times 100$
TDS (%)

LAND USE CAPABILITY CLASSES

((Ref: Soil Survey Manual, IARI, 1970, Fig.9, p.48))

LAND SUITABLE FOR CULTIVATION				LAND NOT SUITABLE FOR CULTIVATION			
CLASS I	CLASS II	CLASS III	CLASS IV	CLASS V	CLASS VI	CLASS VII	CLASS VIII
				Suitable for pasture and forestry			
Very good land with no limitations	Good land with minor limitations	Moderately good land with major limitations	Fairly good land with occasional ally cultivation and major limitations	With no limitations	With minor limitations	With major limitations	Suitable for wild life and watershed

DEGREE OF PERMANENT LIMITATION	
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