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FACULTY OF AGRICULTURAL SCIENCES AND ALLIED INDUSTRIES

SAC-221 Problematic Soils and their Management (2+0)
Lecture 1 introduction

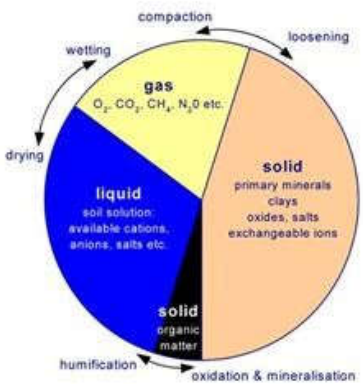
Soil is a natural finite resource base which sustains life on earth. Itis a three phase dynamic system that performs many functions and ecosystem services and highly heterogeneous. Soil biota is the biological universe which helps the soil in carrying out its functions. Often soil health is considered independently without referring to interlinked soil functions and also based on soil test for few parameters. Physical condition of soil and biological fertility are overlooked in soil health management which needs revisiting of soil users. Recognising the importance of soil health in all dimensions, 2015 has been declared as the International Year of Soils by the 68th UN General Assembly. Food and Agriculture organisation of the United Nations has formed Global soil partnership with various countries to promote healthy soils for a healthy life and world without hunger. India, the second most populous country in the world faces severe problems in agriculture. It is estimated that out of the 328.8 m ha of the total geographical area in India, 173.65 m ha are degraded, producing less than 20% of its potential yield (Govt. of India, 1990).

Soil heterogeneity is the reasons for the diverse nature of cropping and production pattern. Soil heterogeneity is the case where soil in a relatively small area varies greatly in texture, fertility, topography, moisture content, drainage etc. If it exists in large scale due to the parent material or manmade activities, then the problem of soil suitability to agriculture arises. (Fig : 3)

Soil consists of a solid phase (minerals and organic matter) as well as a porous phase that holds gases and water. Accordingly, soils are often treated as a three-state system as shown in fig 1. From an agriculture point, the soil should support all the functions as in fig 2

The soils which possess characteristics that make them uneconomical for the cultivation of crops without adopting proper reclamation measures are known as problem soils.

Often we resort to chemical means of reclamation that leads to



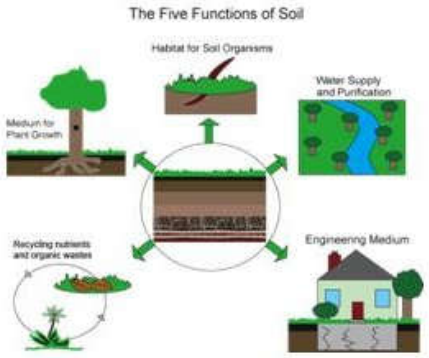


Fig 1. Soil - a three state system http://vro.depi.vic.gov.au/dpi/vro/vroimages.nsf/Images/soilhealth_7898_fig5/$File/7898_fig5.jpg	Fig 2. Soil functions Source:http://soilsurvey.cares.missouri.edu/tutorial/images/functions.gif

impairment of ecosystem functions. Resorting to natural means and integrated methods will resolve the issue and prevent causing irreparable damage

Types of problem soils

Physical problem soils
Chemical Problem soils
Biological Problem soils
Nutritional problem soils as a result of above constraints