

I N T R O D U C T I O N

Throughout the literature of investigations into soil surface structure there appears to be a duplicity of terminology. American and Australian workers refer to the surface sealing phenomenon as crusting, British workers favour capping.

The Shorter Oxford Dictionary gives the following definitions of a crust:- 'a more or less hard coating or deposit on anything' & 'the upper or surface layer of the ground (in reference to a supposed molten interior of the earth) hence geologically, the outer portion of the earth'.

For cap it gives:- 'a cap like covering, a top stratum or layer'.

A case could therefore be made for using either term but because of the connotations of a crust being a baked hard surface it would seem to be a more suitable term for the phenomenon as found in the tropics. Furthermore 'cap' has connotations of something placed as a cover, whereas crusts are definitely formed in situ whether on bread or soil.

For these reasons then it is intended to use the term 'crust' throughout this report.

It is also worth making clear at this stage the difference between crusting and compaction. Both phenomena are found on the U.W.I. Field Station and in this instance are both due mainly to the effect of water on soil structure, they may also be associated with inputs of energy into the soil system.

The crust is a loss of aggregate structure in the surface layers (2-5mm) of the soil only, compaction may follow this and is a loss of aggregated structure to a considerable depth.

The former phenomenon is the one of interest in

this study; the photograph shows the difference between a crusted and compacted soil core.

The soils on the U.W.I. Field Station which show the phenomenon of crusting to the greatest degree are light loams or sandy loams of low aggregate stability. A number of workers have commented on the problem (especially Lamrock 1952/3).

The significance of this problem is thought to be in its effect on such soil properties as infiltration and aeration. If the crust severely limits infiltration into the soil surface the effect will be to reduce the amount of water available for plant growth while at the same time increasing the run-off available for erosive removal of soil particles. If it also effects gaseous diffusion into or out of soils it could have a considerable effect on plant growth due to inhibition of root respiration.

Furthermore the crust has a definite mechanical strength - especially when dry - and this could well have a limiting effect on the emergence of seedlings after germination. These are, briefly, the reasons why the crusting of soils is of interest and perhaps importance. They are then, the justification for this study which will try to elucidate their genesis and structure, some of the effects they have on soil properties and finally to suggest possible methods to ameliorate their effects should this be considered necessary.

