RELATIVE PRODUCTIVITY OF THE A HORIZON OF CECIL SANDY LOAM AND THE B AND C HORIZONS EXPOSED BY EROSION

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The Piedmont Plateau Soil Province of South Carolina comprises a considerable variety of soils of which the Cecil series is the most extensive and one of the most valuable for general farming. It is well adapted to the production of cotton which is the chief source of farm income in this area.

Cultivated areas of Cecil sandy loam, before being materially altered by erosion, have a yellowish-gray or grayish-brown surface soil and a red clay subsoil which is underlain by highly weathered, disintegrated granite or gneiss. The topography where these soils occur varies from undulating to rolling or hilly. The sloping terrain in combination with high rainfall (approximately 50 inches annually) and the use of farming methods conducive to accelerated erosion have resulted in extensive soil loss by water erosion. In some places these soils have eroded to such an extent that their agricultural value has been destroyed entirely.

There are large acreages of Cecil soils in which the A horizon has been removed entirely by erosion, leaving the red clay of the B horizon exposed. Fair crops are frequently produced on such areas, and it is possible in many places to improve them by additions of organic matter and the use of suitable farming practices to such an extent that high yields of crops can be obtained. There are also extensive areas on which both the A and the B horizons have been removed by erosion. When the A and B horizons are eroded they cannot be reformed or replaced by practical agricultural methods. There remains only the highly unproductive weathered rock, which is not classed as a soil but only as the material from which one may be developed when subjected to soil-forming processes for a long period of time.

Field observations of a qualitative nature have shown that erosion of the surface soil causes a decrease in productivity of Cecil soils, but there are no quantitative data available showing the extent of this relation.

Experiments designed to obtain some information regarding the relative productivity of different horizons of Cecil sandy loam were started near Moore, S. C., in 1935.

Twelve experimental areas, each 1/500 acre in size (10 feet by 8 feet, 9 inches), were marked off and excavated to a depth of 2 feet. Each area was enclosed in a creosoted board wall extending to the bottom of the excavation. Soil from the A horizon of Cecil sandy loam was collected from 40 different locations in the South Tyger River Project Area, transported to the desired location, placed in a pile, and mixed. The soil from the B horizon was collected and mixed in