It has been recognized for some time by agronomy research workers and others that each agricultural soil type not only has its strong and weak points with reference to its plant nutrient resources, but that each, as shown by a preponderance of field evidence, possesses certain characteristics which make it particularly well suited for the growth of certain crops and not all for others having entirely different soil requirements. A knowledge of these differences in crop adaptation becomes of the greatest economic importance in the selection and growth only of those crops so far as feasible, which are best adapted to the type or types of soil occurring on each farm and which will after growth best meet the needs of the present type of farming or the type which should be used on the farm. For instance, if a soil type of the farm is particularly well suited for the growth of early truck crops, climatic factors and transportation and market facilities being favorable, such a soil should be given over largely to the production of this class of crops and not be devoted to the growth of unadapted forage crops for the extensive production of dairy cattle for supplying creamery milk or, in an extensive way, to other unadapted crops. On the other hand, if the soil type is of such a nature as to be well suited for the heavy and economic production of forage crops then it had likely best be used, certainly largely, for this purpose and the type of farming practised might well be, if market demands and other economic favors are favorable, dairying or some other type of livestock growing or some other suitable type of farming rather than attempting to grow early truck crops which would usually be found wholly unsuited for growth on this particular type of soil.

These observations appear to be significant in pointing the way for a safe and sound plan for promoting the growth of specially adapted crops to the soils of any farm and for establishing untried list of the Piedmont soil types, which has been found are particularly well suited for the production of each of these crops, has been grouped and an attempt will be made in each case to find an explanation, from all available information, for these special crop adaptations of the soils of each group.

SOIL TYPES FOUND ESPECIALLY ADAPTED TO EACH CROP

As a result of much experimentation and many field observations, it has been found that certain soil types are particularly well adapted to one of these crops and not at all to the other and visa versa. The findings show that soil types of Group I, consisting of Davidson clay loam; Mecklenburg clay loam and loam; and Cecil clay and clay loam (to a lesser extent) are the ones best adapted for alfalfa growing of all Piedmont soils occurring in North Carolina; and soil types of Group II consisting of Durham fine sandy loam, sandy loam and coarse sandy loam; Granville fine sandy loam, sandy loam and coarse sandy loam; Appling fine sandy loam, sandy loam and coarse sandy loam; and Cecil sandy loam (to a lesser extent) are best suited for the production of bright tobacco of the qualities demanded for cigarette manufacturing.

CONTRASTING THE GEOLOGIC ORIGIN AND PHYSICAL PROPERTIES OF THE TWO SOIL-TYPE GROUPS

In Table I is given a list of the rocks from which each of the soil types of the two groups of soils have been largely derived, as well as a brief description of the top and subsoil of the fifteen soil types under consideration - five in Group I and ten in Group II.

The types have the following geologic origins, as will be seen by Table I, and each has the physical properties mentioned below: