THE soil is a complicated natural body, the chemical elements and compounds of which are influenced by climatic conditions (7, 8, 9). The organic components of the soil are influenced by associated vegetation but are affected mostly by the two chief components of climate, namely, rainfall and temperature. The reaction (pH) of the soil and associated conditions influence the type and quantity of vegetation (5) upon the soil; therefore, the organic matter content is obviously indirectly influenced by the parent geological material from which the soil is built.

The fertility of an economic soil is largely determined by the organic matter content, due to the fact that the organic matter contains the soil nitrogen, etc., and also exhibits various other properties. Then, the destruction of the organic matter to liberate nitrogen, etc., is essential in order to realize its great value in producing crops. Again, the chief components of climate, temperature and rainfall, are important factors.

It was pointed out in a previous publication (4) that comparable data for organic matter should include only soils of a given texture and drainage. In studying the fertility factors of soil on which tomatoes or tomato plants are grown the authors have had a chance to analyze a large group of Ap soil samples from various parts of the United States and Canada for the organic matter content, pH value, and various nutrient elements. These data have been assimilated according to certain textural relation and are given in this discussion. Fig. 1 shows the geographical distribution and number of samples, the mean annual temperature and rainfall, and the texture of the soil of the given sections.

VARIATION OF ORGANIC MATTER CONTENT IN SOIL IN A LONGITUDINAL DIRECTION

The predominating soil types on which tomatoes are grown in the three sections, namely, Colborne, Canada (2, 11); Burlington County, New Jersey (1, 7); and Tifton, Georgia (9), are the well-drained sandy loams. The mean annual temperature of these three sections varies from approximately 44° F at Colborne, Canada, to 52° F at Moorestown, New Jersey to 69° F at Tifton, Georgia, or an approximate variation of 25 degrees. The mean annual rainfall decreases from approximately 48 inches at Tifton to 45 inches in New Jersey to 33 inches in the Colborne section. The organic matter content of the well-drained sandy loams, as shown in Table 1, is between 2.0