ROSS measurements of total pore space have failed to characterize the physical condition of soils in terms of plant response. At present the best known method of characterizing the physical condition of a soil as regards air and water relationships is the determination of pore-size distribution. Several technics have been devised for making such a determination \( (2, 4, 5, 6, 7) \). Unfortunately, all these methods are too time-consuming to be used in an intensive study of soils throughout a season or over any very extensive area.

The importance of the relative amounts of large and small pores was recognized by Schumacher as early as 1864. He introduced the terms "capillary" and "noncapillary" to designate the small and large pores, respectively. These terms are obviously misnomers, but since they have received such wide recognition they will be used in this paper in their commonly accepted sense.

Dojarenko, Kvasnikov, Williams, Krause, Sekara, and other European workers have shown that the yield response of many field crops is closely associated with the distribution of the pore space within a soil. Yoder \( (10) \) found a rather consistent trend for low "capillary" pore space volume to be associated with high yield and early maturity of cotton grown in seedbeds composed of clod mixtures and of single clod separates. Nickols \( (8) \) and Randolf \( (9) \) have also demonstrated the importance of size distribution.

Bradfield and Jamison \( (2) \) stated that the "noncapillary" pores—that is those pores between the aggregates—are the ones responsible for drainage, percolation, and aeration. Nelson and Baver \( (7) \) pointed out that there is a better correlation between the pores drained at a tension of 40 cm of water and percolation and structure than at any other tension. They state that, where only one tension is to be used, 40 cm of water \( (pF 1.6) \) is the logical one in studying the physical condition of soils. Baver and Farnsworth \( (1) \) found a direct relation between the pores drained at this tension and the yield of sugar beets. These results would seem to indicate that for general work one point on the pore-size distribution curve is sufficient to give a good indication of the physical condition of the soil, if the proper point is chosen.

It is the contention of the authors that, for practical field studies, it is more desirable to use a drainage tension which more nearly approximates natural conditions. In those regions where tiling is necessary, tension (in centimeters of water) equal to the depth of tile would seem to be very satisfactory. The use of such a tension gives...