In analyzing soils for available boron it was observed that soils containing considerable organic matter were often high in available boron, while soils containing little organic matter were often very low in this respect. It was also noticed that boron deficiencies under field conditions occurred more often on alkaline soils than on acid soils.

The importance of organic residues in releasing soluble boron has been observed by Robinson, et al. Cook and Millar (3) list active calcium, organic matter, and soil texture as factors affecting boron availability. The lack of sufficient available boron in soils to support normal plant growth has been attributed to overliming by Naftel (5) and Chervenkov and Arkhipova (2). Midgley and Dunklee (4) concluded that boron is probably fixed in a difficultly available form by soil organic matter activated by excess lime.

The investigation here reported was undertaken to determine whether the foregoing observed relations of soil organic matter and pH to available boron would be substantiated by suitable tests. For this purpose a large number of soils representing various soil types in Wisconsin were tested for reaction, and analyzed for content of available boron and total organic matter.

**METHODS**

Available boron was determined by extraction with hot water and subsequent colorimetric determination by means of the quinalizarin color reaction as previously described (1). The organic matter was determined by Wilde’s (7) adaptation of the chromic acid titration method. Soil reaction was determined with a glass electrode. Both cultivated and virgin soils were investigated.

**RESULTS**

**CULTIVATED SOILS**

The data for available boron and soil reaction for the 6-inch surface layer of cultivated soils are presented graphically in Fig. 1 and regression lines calculated therefrom are given. These data show that the available boron content of the soils increases as the pH increases from 4.7 to 6.7 and decreases from pH 7.1 to 8.1. Samples falling in the pH range of 6.7 to 7.1 were not at hand for analysis, but the regression lines indicate that a maximum amount of available boron would be favored within this range.

In the surface 6-inch layer of soils having a pH lower than 7.0, the total correlation coefficients, as given in Table 1, show that there is a highly significant correlation between available boron and both pH and organic matter. The multiple correlation coefficients are also highly significant. However, when the partial correlation coefficients are compared, it can be seen that only the partial correlation coefficient between organic matter and available boron, holding the pH constant, is highly significant, indicating that organic matter is exerting the greatest influence on the availability of boron in these soils. A highly significant positive correlation of 0.50 is found when organic matter is correlated with pH in these soils.

In the surface 6-inch layer of cultivated soils with reactions more alkaline than pH 7.0, a significant negative correlation of —0.68 is found between available boron and pH, while the correlation between available boron and organic matter is not significant. The multiple correlation between available boron and both pH and organic matter is highly significant. The partial correlation coefficients show that the effect of pH is highly significant and is tending to reduce the amounts of available boron as the pH increases, while increased organic matter content tends to increase the amount of available boron.

A comparison of available boron and organic matter in the 6-inch surface layer of cultivated soils having a pH less than 7 is given in Fig. 2. Because pH has by far a greater influence on the availability of boron than does organic matter in soils with a pH