BORON DEFICIENCY IN TOBACCO UNDER FIELD CONDITIONS

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THE present definite trend in the fertilizer industry toward the use of relatively pure chemicals to replace the much more complex materials previously employed has accentuated the need of an adequate knowledge of the effects on plant growth of all essential elements. Obviously, use of the highly concentrated materials as the chief or sole sources of nitrogen, phosphorous, and potassium may result in mixtures containing little, if any, of various other elements known to be essential for the higher plants. That boron is an essential element for higher plants has been demonstrated by several investigators in recent years (1, 2, 3, 4, 5, 6, 7). In previous papers (4, 5), the writer has described the distinctive effects of boron deficiency on the growth of tobacco. It was pointed out also (4) that it is possible to obtain symptoms of boron deficiency in pot cultures using field soil.

As far as is known the occurrence of boron deficiency under field conditions has been described only from Sumatra (3) where it is reported to produce a characteristic disease of tobacco known as topsickness (Topziekte).

METHODS OF EXPERIMENTATION

A series of plats to study the effects of varying rates of calcium application on yield and quality of tobacco was started in 1928 and tobacco has been grown on them each year since then. The plats were located at Upper Marlboro, Md., on a phase of the Collington series which is quite sandy and could probably be designated as loamy sand with some gravel admixture. The fertilizer mixture was prepared from mono-ammonium phosphate, calcium nitrate, ammonium nitrate, potassium sulfate, and magnesium sulfate. None of these salts were of the C. P. grade. The materials were applied each year in quantities to furnish 80 pounds of nitrogen (N), 80 pounds of phosphoric acid (P₂O₅), 100 pounds of potash (K₂O), and varying quantities of calcium per acre. Since the quantities of calcium furnished are not to be discussed in this paper, it is sufficient to state that 115 pounds of CaO were supplied as calcium nitrate on the plats under consideration. Magnesia (MgO) was applied at the rate of 20 pounds per acre and sulfur at the rate of 125 pounds of SO₃ per acre.

DISCUSSION OF RESULTS

In 1933 the tobacco developed the characteristic die-back of the terminal bud previously described (4, 5) as distinctive for boron deficiency when the plants were grown in solution cultures and in pot cultures.