TOXICITY OF SEVERAL CHEMICALS TO A SPECIES OF
MOSS COMMON TO OLD PASTURES IN
THE NEW ENGLAND STATES

A. B. Beaumont

RECENTLY, the writer (1)\(^3\) called attention to the toxicity of sodium nitrate to a species of moss (*Polytrichum commune* L) found in upland pastures of Massachusetts. This species is one of the last to appear in the natural succession of pasture plants concurrent with the depletion of plant nutrients from the soil.

PLAN OF EXPERIMENT

In order to study the effect of other materials on this species of moss, a series of small plats was laid out in the spring of 1931. The plat treatments are listed in Table I, and those numbered 1 to 9, inclusive, constitute series 1. These plats received nitrogen materials in quantities to supply 30 pounds and 60 pounds of nitrogen per acre, respectively, and the other materials were applied in chemically equivalent amounts. The effects of the materials of series 1 soon indicated that the different ions of the compounds used were more or less specific in their toxic action on haircap moss. Therefore, in 1932, a second series of plats (treatments 10 to 17, inclusive) was laid out adjacent to or near the first series, for the purpose of studying other ionic combinations. All plat treatments were duplicated. Plats of series 1 were 10 by 10 feet and those of series 2, 5 feet by 10 feet. Treatment of all plats was omitted in 1933 but was repeated in 1934. Therefore, plats of series 1 received three applications of materials and those of series 2 received two applications in the period of 1931 to 1934. At the beginning of the experiment the areas treated had a ground vegetation cover consisting of 85% to 95% haircap moss and small percentages of bent grasses, Kentucky bluegrass, "poverty" grass, hard hack (*Spiraea tomentosa* L), running cinquefoil (*Potentilla canadensis* L), and other weeds. The soil is a well-drained glacial till classed as Cheshire fine sandy loam, stony phase.

RESULTS AND DISCUSSION

In the fall of 1934 an estimate of the percentage of eradication of haircap moss was made and samples of soil taken for laboratory studies. The average percentage eradication of moss for each treatment is given in Table I.

It is apparent that wide differences in the degree of eradication of the moss were obtained. Eradication was greater with the larger amount of material used in every case, but with few exceptions practically the same order prevailed among materials used. Sodium nitrate was the most effective material used, but a strict comparison between this material and those of series 2 is not possible because of the difference in the number of applications made. No significant difference in the effect of the Chilean and synthetic nitrates was ob-

---

\(^1\) Contribution from the Department of Agronomy, Massachusetts State College, Amherst, Mass. Contribution No. 210, Massachusetts Agricultural Experiment Station. Received for publication December 8, 1934.

\(^2\) Professor.

\(^3\) Figures in parenthesis refer to "Literature Cited," p. 137.