THE EFFECT OF BORON ON SEED PRODUCTION OF ALFALFA

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The inconsistency of seed production of alfalfa has long been recognized, but the basic factors responsible for this irregularity have remained somewhat of a mystery. The literature on the subject contains a wide diversity of opinions as to the factors which influence or control the seed set of this plant. Among the factors affecting the seed set of alfalfa which have received the most attention in the past are selection and breeding for increased ability to set seed; tripping of the flowers and factors affecting tripping; soil texture; climatic factors, such as the amount and distribution of rainfall, humidity, and temperature; and fertilizer treatments. During recent years, work has been reported which shows that boron, under some soil conditions, enhances the seed set of alfalfa (1, 2, 4).

Growers of alfalfa in the Southeast have observed for many years that stands of alfalfa persist for only short periods and that yields have been comparatively low, usually being reduced to such an extent that they become uneconomical by the end of the second year. Willis and Piland (5) of North Carolina were the first to call attention to the fact that "alfalfa yellows" in the Southeast could be corrected by the application of small quantities of boron to the soil. This discovery prompted the use of boron as a possible remedy for "alfalfa yellows" at the James City County Station at Williamsburg, Va., in 1939, where Hutcheson and Cocke (3) found that an annual application of 10 pounds of borax per acre gave a 49% increase in the yield of alfalfa. In addition to the increased yield, it was also observed in the summer of 1940 that alfalfa on the plots which received borax blossomed very profusely, while that on the plots which received no boron blossomed very sparingly. This observation indicated that the application of boron to alfalfa soils might increase the seed set of the crop. Work was thus begun to test this point, and the first year's results of this study are herein reported.

MATERIALS AND METHODS

The results presented in this paper were obtained from a rate of liming and fertilizer experiment. The alfalfa crop was seeded in August, 1939, on Cecil sandy loam soil at Chatham, Va. The plots were 1/40 acre in area and in duplicate. Ground dolomitic limestone was applied to all plots in series 1 at the rate of 2 tons per acre and to all plots in series 2 at the rate of 1 ton per acre before seeding. A 0–20–20 fertilizer was applied to all plots in series 1 at the rate of 2 tons per acre and to all plots in series 2 at the rate of 1 ton per acre before seeding. A 0–20–20 fertilizer was applied at the rate of 1,000 pounds per acre to plots 1 to 3, inclusive, in each series. Plots 4 to 6, inclusive, in each series received 500 pounds per acre of the same fertilizer. Immediately after the first cutting of hay

1Contribution from the Department of Agronomy, Virginia Agricultural Experiment Station, Blacksburg, Va. Received for publication November 27, 1941.
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3Figures in parenthesis refer to “Literature Cited”, p. 368.