A COMPARISON OF BORON DEFICIENCY SYMPTOMS
AND POTATO LEAFHOPPER INJURY ON ALFALFA

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A YELLOWING of alfalfa caused by the potato leafhopper, Empoasca fabae, was described in 1927 (4) and since that time several papers have dealt with the nature of this injury (1, 2, 3, 6, 7). In describing the yellowing, Granovsky (2) placed emphasis on the striated discoloration of the areas between the lateral veins. He also reported a shortening of the internodes of the new growth, and rosetting of the new shoots.

Boron deficiency symptoms on alfalfa were recognized some 10 years later (5, 8) and in the description of McLarty, Wilcox, and Woodbridge (5), there was emphasized a uniform yellowing and (or) bronzing over the intercostal area of the terminal leaves, a shortening of the internodes, and death of the growing points.

The leafhopper symptoms were described before boron deficiency was known to be a problem, and the symptoms due to a lack of boron were described either in the absence of leafhopper injury or without recognizing it as contributing to the abnormality. Since the existing descriptions are not adequate to differentiate clearly between the two types of injury, a comparison of these symptoms has been made in the greenhouse and under field conditions in New York where both agencies contribute to alfalfa yellowing.

EXPERIMENTAL

GREENHOUSE STUDIES

The general plan of the greenhouse investigation was to infest healthy alfalfa cultures with leafhoppers and to compare these symptoms with those caused by a deficiency of boron under similar conditions.

Forty 2-gallon stone jars containing two or three 18-month-old plants growing in a sub-surface sample of Dunkirk sandy loam which was deficient in boron were used as a source of material. To 20 of these, boric acid to supply 0.046 p.p.m. B (dry weight basis) was added on April 14, 1941. The 20 remaining pots received no added boron. All plants were clipped on April 14. On May 19, six of the boron-treated jars and two of the minus boron jars were each caged and infested with 25 nymphs and 10 adults of the potato leafhopper.

Complete nutrient solution minus boron was supplied to all cultures, and distilled water was used to maintain moisture. They were placed in the regular greenhouse, receiving only natural light. On June 2, final observations were made.

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2 Research Fellow in Soils and Assistant Professor of Entomology, respectively. The senior author wishes to express his appreciation to the American Potash Institute, Inc., for providing the fellowship which made possible his participation in this study. Both authors gratefully acknowledge the Institute's additional assistance in supplementing college funds for the colored plate.

3 Figures in parenthesis refer to "Literature Cited", p. 498.

4 Acknowledgment is made to Prof. J. K. Wilson who donated these cultures which he had used for other work prior to this time.