THE STIMULATION OF ROOT FORMATION ON ALFALFA CUTTINGS
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THE work of Zimmerman and Wilcoxon with various organic chemicals which stimulated root development upon the stems of growing plants suggested the use of these chemicals to aid in the vegetative propagation of outstanding alfalfa plants obtained in the breeding nursery. Not only might a much greater quantity of seed be obtained in this way, a very important consideration in breeding work, but also the establishment of a number of individuals of the best plants in the greenhouse for seed production without disturbing the originals in the field would be possible, affording an opportunity to make additional observations on the adaptability of such plants in the field.

In the spring of 1936 three preliminary experiments were conducted on 270 cuttings taken from a number of different alfalfa plants. The treatment consisted of cutting alfalfa stems into two-node lengths, stripping off the leaves from the lower node, and placing the cutting in a water solution of the organic chemical for a period of 5 to 10 minutes. Indole acetic acid was used at a concentration of 50 p.p.m. Since alpha-naphthalene acetic acid could not be purchased for this study, an effort was made to synthesize the compound by refluxing naphthalene and chloracetic acid in equivalent proportions at 175°C for a period of 72 hours. The resultant organic residue was then treated with 10% sodium hydroxide, the filtrate with 10% hydrochloric acid, and the precipitate further purified with hot water. The slightly milky solution obtained in this manner was used as the stimulating substance. It was recognized that, while the above procedure should yield largely the alpha form of naphthalene acetic acid, some of the beta form might also be present. The yield was too low to permit the determination of the purity of the product used.

After treatment, the cuttings were placed in flats of sterile sand, where they were watered and covered with glass to prevent excessive transpiration.

The above studies led to the following conclusions:
1. Naphthalene acetic acid, as Zimmerman and Wilcoxon found on stems of growing plants, was superior to indole acetic acid in stimulating the formation of adventitious roots from cuttings.
2. Both compounds tested caused more roots to be formed per cutting and stimulated slightly earlier formation of these adventitious roots than when the cuttings were untreated.
3. Although in several instances a greater percentage of the treated cuttings formed roots than the untreated cuttings, the results indicated that this was not always true.

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