Flowering Habit of Alfalfa Clones During the First and Second Growth

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INFORMATION on the flowering habit of alfalfa would appear to be fundamental to seed production research, since flowering precedes the other complex mechanisms that lead to the seed harvest. Preliminary observations of plants in breeding nurseries at Madison, Wis., suggested that inherent differences in flowering habit existed, provided that sucking insects such as the tarnished plant bug, *Lygus oblineatus* (Say), the alfalfa plant bug, *Adelphocoris lineolatus* (Goeze), and the potato leafhopper, *Empoasca fabae* (Harris) were controlled. It was not known if the node at which the first flower appeared on the stem was a stable and significant morphological characteristic of the plant, or if it were variable according to environmental factors. Therefore, the experiment reported here was designed to study the nodal location of the first flowering rachis in different plants during the first and second growth.

METHOD

In September 1950, ten parent plants of different genetic stocks were obtained from a field nursery at the University Hill Farm, Madison, transplanted into pots in a greenhouse, and clipped back. After sufficient regrowth had occurred, 5 stems, having as near to the same number of nodes as possible, were selected from each of the 10 plants. In December, cuttings were made from each node of each stem and propagated in sand in flats. About a dozen cuttings were obtained from a stem. The sequence of node location from the base to the apex of the stem was carefully maintained. After roots had developed, the cuttings were transplanted into flats with soil. When the plants were about 6 inches tall, they were moved from the greenhouse to a cold frame, and held there until transplanted into a field nursery on June 10, 1951. Here it is noted that the cutting from one of the parent plants had largely died out, and it was necessary to carry on the experiment with only nine clones.

The young plants were spaced at 6-inch intervals in rows 24 inches apart and 21 feet long. The plant propagated from the lowest node of stem 1, clone 1, was the first in the row in the same sequence as the nodes on which they were propagated. This procedure was followed for the plants propagated from stem 1, clone 1, and all others in the row were randomized but the node to node sequence of cuttings within a clone was maintained. The nursery plants were planted in a “S” shaped pattern, giving in effect a continuous row throughout.

Control of sucking and other harmful insects was carried on throughout the growing season with applications of DDT, dieldrin, or other appropriate insecticides. Weeds were kept down by cultivation and hand weeding.

When flowers began to appear on the plants in each of three stems from each individual plant in the nursery, the first raceme on each of the stems was recorded. This reading was obtained by counting the nodes from the first discernible node at the base of the stem up to the node where the first raceme appeared. After readings were obtained in the first growth, the plants were clipped. After the readings were completed in the second growth, the plants were again clipped, but the fall regrowth remained on the plants for winter protection.

The flower counts were made in the first growth periods of early August 1951; June 30 to July 2, 1952; June 16 to 19, 1953; and second growth periods of early September 7 to 18, 1952; and July 28 to 29, 1953.

RESULTS

A certain amount of plant mortality occurred during the experiment, which made it impossible to make series in all five replicates of a clone. A portion of the data showed that complete series could be obtained by dropping one replicate and eliminating some terminal nodes. In the statistical analysis of the plant nodes in unbroken series ranged as follows: 2–8 (2), 2–9, 3–8, 3–9, 4–9 and 5–11. It was necessary to use 3 replicates only for clone 5.

The average node location of the first flowering rachis of the nine clones is given in table 1. These data showed...