RELATIVE PROMPTNESS OF NODULE FORMATION AMONG VETCHES, VETCHLINGS, WINTER PEAS, CLOVERS, MELILOTS, AND MEDICS

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THE conditions under which root nodules develop most readily on the roots of leguminous plants have been less intensively studied than the importance of the subject warrants. The more elaborate of the investigations have been conducted in the laboratory, where the host legumes necessarily have been subjected to highly artificial conditions. These and other considerations pointed to the need for supplementary investigations to supply data on the development of root nodules under field conditions, hence a series of field experiments has been conducted for a number of years on the Experiment Station farm at Auburn, Ala.

This paper is a report on one of a series of field studies to determine to what extent, if at all, winter legumes differ among themselves in their promptness or tardiness in developing root tubercles when planted in the field at usual or typical dates in the fall.

METHODS

Two plantings of all species were made each year, the first as near to October 1 and the second to November 1, as practicable. The seed were planted in rows 3 feet apart at a depth of 2 inches for the vetch group and of 1 inch for the small-seeded group. This field, of Norfolk sandy loam, was annually prepared, fertilized, and cropped as uniformly as possible. Phosphate in moderate amount was applied early each year and out of contact with the seed. Samples consisting of as many plants as practicable were collected at intervals of one to several days from three or more locations on each plat and the nodules were counted.

Generalized nodulation was considered as occurring when 85% or more of the plants of a given sample were found to bear one nodule or more. The day when a considerable percentage of the young seedlings came up and were thus first exposed to light was taken as the day of emergence. The term "nodulation period" is here used to designate the interval between emergence and generalized nodulation as defined above.

Seed of all species and for every date of planting were artificially inoculated by soaking them for about an hour in a suspension of the appropriate inoculum. Humus cultures from the same manufacturer were used each year on seed of all species. The micro-organisms appropriate to the vetches were widely distributed in this soil throughout the experimental period; but the bacteria suited to the clovers, melilots, and medics were absent or very scarce.

RESULTS

VETCHES, VETCHLINGS, AND WINTER PEAS

The average number of days between emergence and generalized nodulation of each species is shown in Table 1.