THE use of various winter legumes for soil improvement is becoming general in the South, especially in Alabama. Hairy vetch (Vicia villosa) is one of the most important of these winter legumes. In order to obtain the best results with hairy vetch it is necessary to apply fertilizers, particularly phosphate, and to inoculate the plants. In the past farmers have been advised not to apply superphosphate in contact with the inoculant as it was thought that the phosphate would injure the inoculation. It has been recommended that basic slag could be applied in contact with the inoculant. In order to study the effect of fertilizers on inoculation and growth the experiment reported herein was conducted.

PLAN OF THE EXPERIMENT

This experiment was conducted at Auburn, Alabama, on a very light, Norfolk sandy soil, on which vetch or Austrian winter peas had never grown. Each treatment was replicated four times and the replications were distributed systematically over the area. There were eight tiers, each containing 20 plats 16.5 by 27 feet, or 1/100 acre. The plats were separated by 2-foot alleys. Every fourth plat received basic slag, was not inoculated, and served as a check plat. Hairy vetch was planted on September 23, 1936, at the rate of 30 pounds per acre in rows 4 feet apart making four rows per plat. The seed were disinfected with mercuric chloride. The commercial inoculant was applied according to the directions of the manufacturer. Soil inoculant was applied in the drill at the rate of 500 pounds per acre. The seed were covered immediately after planting in order to prevent any possible injury from the sun.

On half of the plats the fertilizer was applied in the drill by hand and the inoculated seed were then dropped on top of the fertilizer and covered. On the soil-inoculated plats the fertilizer and seed were distributed in the same manner as above and the inoculated soil placed on top of the fertilizer and seed.

On the other half of the plats the fertilizer was mixed with the soil by running a plow in the rows before the seed were planted.

In order to determine growth, 100 representative plants were dug from each plat on November 11, 1936, and on December 13, 1936. The number of nodules were counted, the tops and roots were separated and weighed after having been dried in the oven, and then were analyzed for total nitrogen. On February 10, 1937, 100 plants were dug from each plat and the same determinations made except the nodules were not counted. On March 10, 1937, and April 10, 1937, the same determinations were made on plants from an entire row from each plat.

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