IT HAS BEEN definitely established that Rhizobium survives in soils for considerable periods of time in the absence of the host plants. The length of time of survival is controlled largely by such factors as moisture, light, the presence of such cations as calcium and hydrogen, and antagonistic organisms in the soil.

The majority of the experimental work on the longevity and survival of Rhizobium in both field and greenhouse has been done on the heavier soil types. Very little has been reported where the light sandy soils characteristic of the Coastal Plains region have been used. The need for information regarding survival of Rhizobium under these conditions has stimulated research along this line and this paper is a progress report of the results obtained.

Nobbe and Hiltner (6) were among the first to report that soil inoculated one season would inoculate the crop the following year. Fred, et al. (3) reported instances where at least 17 years had elapsed between crops of soybeans on the same field and good inoculation was obtained. Deherain (2) found vetch plants to be inoculated on fields that had not grown legumes for 25 years. A very good summary of the many papers concerning the effect of sunlight, desiccation, acidity, and antagonistic organisms is given by Albrecht and Turk (1).

EXPERIMENTAL

LONGEVITY OF RH. TRIFOLII IN A LEON FINE SAND IN THE GREENHOUSE

Leon fine sand, a Ground-Water Podzol representative of the flatwoods lands of the lower Coastal Plains, was chosen for this part of the experiment. This soil is being used to a considerable extent for clover pastures in Florida. Forty-four 1/4-gallon earthenware pots were filled with the soil and 22 treatments made in duplicate March 19, 1941. (For a detailed outline of the treatments see Table 1.)

After the treatments were made the pots were covered and provision was made for adding water without contamination. Sterile distilled water was used in maintaining the moisture level at 60% of the water-holding capacity of the soil.

The clover was allowed to grow for 7 weeks and an incubation period of 1 week allowed seeding. At the end of the incubation period cultures together with the original pots were inoculated in a 1:1000 mercuric chloride solution for minutes and then thoroughly washed in sterile water. Moisture was maintained in the pots throughout the incubation and growing periods by frequent additions of Crone's nitrogen-free salt solution.

The clover was allowed to grow for 7 weeks, this time the plants were removed from the sand washed from their roots, and the degree of nodulation determined (Table 1).

The remaining set of duplicate pots was held until the 20th month from the beginning of the experiment. At that time the soils in these pots were used to inoculate the 20th soil in sterile, builder's sand in a manner with that used for the first group. Trifolium repens was planted and after 7 weeks of growth the amount of nodulation was determined (Table 1).

The pH of the treated soils was determined colorimetrically at the end of the experiment. The results obtained are recorded in Table 1.

LONGEVITY OF TWO STRAINS OF RH. TRIFOLII AND RH. MELILOTI IN TWO SOIL TYPES IN THE FIELD

Soil samples were taken for this experiment from two soil types that were growing clover varieties from the Trifolium and Medicago groups. These had been inoculated with cultures of locally isolated and commercial strains of Rhizobia. The soils selected were Blanton fine sand, a representative of the rolling sandy pine lands and Plummer fine sand, a Half-bog soil of the flat pine lands. They occupy rather extensive areas in Florida.

The soils were treated prior to planting with 1,000 pounds of 18% superphosphate and 200 pounds of muriate of potash per acre. Sufficient lime was used on each area to bring the reaction approximately pH 7.0. A good stand of well-inoculated clovers was produced during the season of 1941-42. The clover plants died down in the late spring of 1942 but volunteers came up in the rolling sandy pine lands and Plummer fine sand areas during the late fall months.

The soils were treated prior to planting with 1,000 pounds of 18% superphosphate and 200 pounds of muriate of potash per acre. Sufficient lime was used on each area to bring the reaction approximately pH 7.0. A good stand of well-inoculated clovers was produced during the season of 1941-42. The clover plants died down in the late spring of 1942 but volunteers came up in the rolling sandy pine lands and Plummer fine sand areas during the late fall months.

Approximately 11 months after treatment one complete set of replicates was used to inoculate 1/4-gallon earthenware pots of sterile builder's sand. This was accomplished by taking an amount of moist soil equivalent to 50 pounds of muriate of potash per acre. Sufficient lime was used on each area to bring the reaction approximately pH 7.0. A good stand of well-inoculated clovers was produced during the season of 1941-42. The clover plants died down in the late spring of 1942 but volunteers came up in the rolling sandy pine lands and Plummer fine sand areas during the late fall months.

The soils were treated prior to planting with 1,000 pounds of 18% superphosphate and 200 pounds of muriate of potash per acre. Sufficient lime was used on each area to bring the reaction approximately pH 7.0. A good stand of well-inoculated clovers was produced during the season of 1941-42. The clover plants died down in the late spring of 1942 but volunteers came up in the rolling sandy pine lands and Plummer fine sand areas during the late fall months.

The soils were treated prior to planting with 1,000 pounds of 18% superphosphate and 200 pounds of muriate of potash per acre. Sufficient lime was used on each area to bring the reaction approximately pH 7.0. A good stand of well-inoculated clovers was produced during the season of 1941-42. The clover plants died down in the late spring of 1942 but volunteers came up in the rolling sandy pine lands and Plummer fine sand areas during the late fall months.

The soils were treated prior to planting with 1,000 pounds of 18% superphosphate and 200 pounds of muriate of potash per acre. Sufficient lime was used on each area to bring the reaction approximately pH 7.0. A good stand of well-inoculated clovers was produced during the season of 1941-42. The clover plants died down in the late spring of 1942 but volunteers came up in the rolling sandy pine lands and Plummer fine sand areas during the late fall months.

The soils were treated prior to planting with 1,000 pounds of 18% superphosphate and 200 pounds of muriate of potash per acre. Sufficient lime was used on each area to bring the reaction approximately pH 7.0. A good stand of well-inoculated clovers was produced during the season of 1941-42. The clover plants died down in the late spring of 1942 but volunteers came up in the rolling sandy pine lands and Plummer fine sand areas during the late fall months.

The soils were treated prior to planting with 1,000 pounds of 18% superphosphate and 200 pounds of muriate of potash per acre. Sufficient lime was used on each area to bring the reaction approximately pH 7.0. A good stand of well-inoculated clovers was produced during the season of 1941-42. The clover plants died down in the late spring of 1942 but volunteers came up in the rolling sandy pine lands and Plummer fine sand areas during the late fall months.

The soils were treated prior to planting with 1,000 pounds of 18% superphosphate and 200 pounds of muriate of potash per acre. Sufficient lime was used on each area to bring the reaction approximately pH 7.0. A good stand of well-inoculated clovers was produced during the season of 1941-42. The clover plants died down in the late spring of 1942 but volunteers came up in the rolling sandy pine lands and Plummer fine sand areas during the late fall months.

The soils were treated prior to planting with 1,000 pounds of 18% superphosphate and 200 pounds of muriate of potash per acre. Sufficient lime was used on each area to bring the reaction approximately pH 7.0. A good stand of well-inoculated clovers was produced during the season of 1941-42. The clover plants died down in the late spring of 1942 but volunteers came up in the rolling sandy pine lands and Plummer fine sand areas during the late fall months.