

UNIVERSITY OF FLORIDA
GAINESVILLE, FLORIDA

AGRICULTURAL EXPERIMENT STATION

45th ANNUAL REPORT
FOR THE FISCAL YEAR ENDING
JUNE 30, 1931

A marked relation has been observed to exist between the availability of potash and the susceptibility of peanut plants to this disease. Plots which have been cropped so heavily that practically all of the potash has been removed from the soil are observed to produce plants which are severely injured by the attack of this disease. It appears that infection readily follows the initial breaking down of the leaf and stem tissues brought about by potash deficiency.

Potato Scab

Rather extensive studies upon the relation of soil treatment to the occurrence of scab infection upon potatoes have been under way during the year. These as well as others upon varietal susceptibility have produced little of value, however, due to failure in the development of the disease even upon the control plots. The plantings upon all plots were inoculated with infected soil.

In connection with certain soil treatments for the control of the disease, severe injury was observed to follow the use of ethyl mercury phosphate and ethyl mercury arsenate upon saw-grass soil.

Everglades Source-of-Seed Trials with Potatoes

Rather extensive tests were conducted during the year upon potato seed from various sources, especially through the Middle West. Comparative results of exceptional interest were obtained from these studies in relation both to the amounts of the various virus diseases they contained as well as to their yielding ability. The plantings were made upon a good grade of "Okeechobee" muck and no fertilizer treatment was given.

The highest yield was obtained from a certified lot of disease-free seed which produced 229.6 bushels per acre. In contrast with this the lowest yielding sample produced only 95.6 bushels per acre and had 49% of the plants infected with mosaic and leaf roll. An unusually wide variation in quality was found in the seed from various sources that were brought together for test in this way.

INVESTIGATIONS RELATIVE TO THE SO-CALLED "YELLOW" DISEASE OF BEANS

State Project No. 125

H. H. Wedgworth, Leader

Investigations relative to the so-called "yellows" and "root-rot" diseases of beans, with particular reference to areas adjacent to

Lake Okeechobee, have been continued during the year largely as soil reaction studies, particularly in relation to the availability of manganese to the growing plant.

Several rather extensive field experiments have shown that, in practically all instances, the trouble can be controlled by proper applications of soluble manganese or by treatment of the soil with actively or potentially acidic materials such as sulfur or sulfuric acid in such a way as to render available such supplies of manganese as are already present.

It appears that the trouble is largely to be associated with excessive lime in the soil and that beans are particularly sensitive to this condition. Such a correlation would seem to indicate that trouble of this nature might be expected upon burned soil. This is found to be the case in practice, the persistency of the trouble varying almost directly, in fact, with the intensity of the burn.

During the coming year it is hoped to investigate rather fully the pathological anatomy of plants growing under such conditions and particularly to examine the relation of certain microorganisms that are frequently found associated with certain stages of their decline.

STUDIES UPON THE ROLE OF SPECIAL ELEMENTS IN PLANT DEVELOPMENT UPON THE PEAT AND MUCK SOILS OF THE EVERGLADES

Project No. 168

R. V. Allison, Leader

During the past year most attention in the work under this project has been given to the continuation of translocation studies with copper. This work, in which cane largely has been used, has been repeated in the greenhouse and also carried out under field conditions. During the coming year it is hoped to extend studies of this type to the manganese problem, especially in connection with relation to this element to plant growth under conditions of excessive alkalinity in the soil environment. These investigations are designed primarily to ascertain, so far as possible, the localization of plant response to special elements of this type in connection with the important role they play in plant development when applied under certain conditions to our peat and muck soils.

During the year studies also have been inaugurated upon the relation of application of increasing quantities of such special elements as copper, manganese and zinc to plant growth in our organic soils when applied in quantities ranging as high as 10,000 pounds of the first two, and 500 pounds of the last as their sul-

fates, per acre. Several crops have been removed from a series of such plots and it has been a matter of some surprise that good growth has followed in most cases even upon the higher applications though not without some foliage injury with the extreme rates. Soil examinations have shown, too, that a considerable portion of the metallic ions involved in these treatments has been held rather tenaciously in the top few inches of the soil. It is hoped to extend this study to include lead, arsenic, barium, and other special elements of this same general category that may accumulate in the soil as residues of spray or dusting activities.

STUDIES UPON THE PREVALENCE AND CONTROL OF THE SUGAR-CANE MOTH STALK BORER IN SOUTH FLORIDA

State Project No. 169

R. N. Lobdell, Leader

Work upon the sugarcane moth borer during the year has consisted largely of field observations upon the prevalence of the insect in various sections, with particular emphasis upon the occurrence of native parasites.

The highest infestation count found at any point in the Glades during the year was 19 percent in the Canal point area. The highest count in this same area during the previous season was 15%. The average count for eight stations in the Canal Point area during the past year, however, was between 8 and 9%. During the same period similar examinations made here at the Experiment Station showed values as low as 0.16%. This condition of infestation in the Glades is a strong and interesting contrast with that observed in the Sarasota area where 100% stem infestations are rather common. The essential basis of the remarkable difference in the degree of infestation in these two areas is of much scientific and practical interest and constitutes a problem upon which it is hoped to spend a considerable amount of time during the coming year. In connection with what has appeared a consistently low infestation in the Glades during the past few years, it is worthy of note that counts in representative areas have been somewhat higher last year than during the previous season.

A few *Trichogramma minutum* bred at the Station were released in the Canal Point area. However, no parasites have emerged from any of the eggs brought into the insectary from this section. It is hoped that the work upon this and other parasites may be developed upon a more intensive basis during the coming year.