

## REPORT OF INVESTIGATIONS AT MASSEY AGRICULTURAL COLLEGE.

By Dr. J. S. YEATES.

*Selection, Breeding, and Testing.*—The total number of strains now represented as fans in the planted area on the College farm is 250. Those planted at the beginning of the work have grown well, and will be ready to cut for testing purposes in another eighteen months. The varieties added to the collection this year include some twenty from the Pukekura Park, New Plymouth. They were part of a valuable collection of fine Maori varieties planted many years ago by Mr. W. W. Smith. Other varieties were secured from Maori plantations in the Waikato district and from scattered localities. An area of 1 acre planted in fans of a single good variety, is growing satisfactorily.

*Seedlings.*—The first seedlings grown are now almost two years old. Growth has been excellent, and these plants are now ready to plant out finally for testing purposes. The seedlings are from pod-by-pod planting of seed from fans in our collection, so that valuable information will be obtained as to the breeding-behaviour of these strains. Already it is possible to see with certainty how some important characters are inherited. One conclusion of considerable interest is that none of the twenty strains grown in the first year breeds true. We hope to select from these seedlings true-breeding strains of good quality. The seedlings now one year old include pod-by-pod sowings of more than one hundred of our strains. These are all planted out in seedling rows. Some most interesting facts are already shown in relation to the inheritance of bronze coloration in several strains.

*Hybrid Seedlings.*—The plants from crosses made in 1928 are growing very well. The object of this work was to combine disease-resistance and excellent fibre qualities of one strain with heavy cropping-powers of another. Further crosses have been made this year with the same object. Success was obtained in crossing several excellent varieties with the one (Seifert's Superior) which is resistant to yellow-leaf disease. It is expected that some thousands of seedlings will result from these crosses.

*Manurial Trials.*—Manurial trial plots have been set out on a total area of 5 acres, in three different localities. The object of these plots is largely to see whether the loss due to yellow-leaf disease can be reduced by suitable manures.

*Yellow-leaf Disease.*—Much of the above work, such as crossing and manuring, is aimed at solving the yellow-leaf problem in a practical manner. In addition, several strains of flax have been selected which appear to resist the disease, and these are being tested. Mr. Meadows has been concentrating on the isolation of fungi and bacteria from diseased plants in an attempt to find the cause of the disease. A number of pure cultures have been isolated and tests are being carried out to see if any of them is responsible for the disease. A number of other branches of this work have been started, but have not yet reached a stage where any progress can be reported. This refers to the possibility of yellow-leaf being a virus disease, or a disease due to soil deficiency.

*General.*—Visits have been paid to the main commercial flax-plantations for the purpose of observing progress and securing photographic records. The main phormium trial area at the College has now some 2½ acres under flax. A further area of about 3 acres is to be planted out during this autumn. This clay land is, of course, far from ideal for the purpose of flax-growing. It is hoped, however, that drainage now being undertaken will improve matters.

## MINERAL CONTENT OF PASTURES RESEARCH.

Advisory Committee: Professor H. G. Denham (Chairman), Mr. Q. Donald, Mr. S. Fletcher, Professor W. Riddet, Mr. Bruce Levy. Directors of Research: Mr. B. C. Aston and Mr. T. Rigg.

## EXTRACTS FROM REPORT PRESENTED BY B. C. ASTON, DIRECTOR.

*Pasture-analysis.*

At the beginning of the working-year a scheme of work was laid down for the year which would indicate roughly the effect of seasonal changes on the composition of typical pastures. The initial demand that the sampling of the pastures was a highly important work which required just as much skill lavished on it as on the analysis having been conceded, Mr. Grimmett, who has always been utilized as the officer in charge of the country work, was charged with the duty of supervising the collection of the pasture and soil samples.

The areas set down for intensive study in the North Island were: (1) the Te Kuiti district; (2) the Rotorua district.

Various troubles in stock occurring in these districts led to their being chosen for work in this investigation, among which were—

- (1) Temporary sterility;
- (2) Eclampsia;
- (3) Waihi disease;
- (4) Bush disease or similar trouble;
- (5) "Dopiness," or Mauroa malnutrition;
- (6) Iodine deficiency.

Under the close supervision of the local or other veterinary officer, in all cases, except Te Kuiti, farms were selected from which during this year periodic samples could be collected. It is not anticipated that work for one year would establish seasonal differences. The seasons in the North Island are notoriously fickle, the temperature and precipitation being extremely variable for the same season in different years. It was impressed on the samplers that they should exercise the greatest care in selecting the samples, and the Department obtained two assistants who were peculiarly fitted for this work.