

In connection with feed-flavour investigations, type analyses have been made of a block of 1,000 plants grown from seeds hand-harvested from the white clovers present in Waikato pastures.

Some six hundred plants representing first harvest progeny from areas sown with pedigree seed are under study also.

8. *Montgomery Red Clover*.—(a) Plant Breeding and Selection: The 1936 block of 2,400 single plants from controlled crossings has been under constant observation. Some seventy-four plants were selected from this block for further crossing in pairs, but as the result of unseasonable weather these plants failed to flower sufficiently. These crosses will be attempted again in the 1937–38 crossing-season. During the last twelve months virus infection has been most severe on all red clover single plants. This is making the selection work more difficult and is tending to retard progress towards improved strains.

(b) Pedigree Strain Production: As yet there is only one contract area of 3 acres sown with nucleus stock from the increase area. This year only 9 lb. of dressed seed have been obtained from the $\frac{1}{2}$ acre increase block, which has been harvested for the third time in succession.

(c) Single Plants: A further 1,500 plants have been raised from best commercial seed and station-grown lines. These are required in order to increase the supply of superior original plants.

9. *Subterranean Clover*.—(a) Strain Testing: The strain-testing work has been continued and the testing of three New-Zealand-grown samples with a view to certification is in progress.

Two field strain trials have been put down this autumn—one being at the Pure Seed Farm, Lincoln, and the other on light plains land near Burnham. More field strain trials would be desirable but seed supplies of selected strains are limited.

(b) Seed Production: Owing to the extremely wet weather experienced in the summer months seed production from selected strains was not a success. Only small amounts of seed, each low in germination, were harvested.

Seed production will be attempted again this coming summer.

10. *Lotus Major*.—The original fifty-four tiller rows have been reduced to fifteen. Plants from them will be used for selection purposes.

ECOLOGY AND FIELD TRIALS.

During the year under review this Division has provided the seed for twenty-three sets of strain trial field plots, which have been laid down by the officers of the Department of Agriculture. The reports coming in regarding these trials indicate in most cases the superiority of the selected and pedigree strains of grasses and clovers. In all, 108 such trials have been laid down in various parts of New Zealand. Seed for special trials has been provided in addition to the above, and good reports on pedigree seeds have been received.

PASTURE ANALYSIS.

Point analysis of pastures has been continued at Marton Experimental Farm and on several of the strain trials sown down in this district, and also in connection with the pasture side of the feed-flavour investigations. Analysis by weight, of the plucked and mown herbage from the plots both at Palmerston North and Marton, has been continued, and some very valuable figures relative to pasture changes have been secured. An attempt has been made to correlate "point analysis" and "herbage dissection analysis" with a possibility of evolving a technique suitable to measure herbage production and seasonal production of various species.

The lack of trained assistants precludes the extension of exact pasture analysis over a wide area, but such work is highly desirable and will be persevered with as opportunity offers.

PASTURE SURVEY.

During the year a system was evolved of mapping the country fairly rapidly so that even small details, paddock to paddock differences, could be recorded. The area in Hawke's Bay completed up to 31st March comprises some six hundred square miles, and during the progress of this work much valuable information concerning the pasture types has been obtained. Great value attaches to this work, and it is probable that a much better general understanding of the pasture problems of the country would result from a complete pasture survey of the Dominion. The potentialities of all grasslands can be gauged fairly accurately by the use of the pasture map in conjunction with the soil survey map. A very heterogeneous mixture of pastures and pasture species has been recorded, and it is quite apparent there is much room for pasture improvement on a sound economic basis.

The factors influencing pasture type may be summarized as follows: Soil type; farm management and practice; climate; topography of country; proximity to rail; top-dressing; use of correct pasture species for the particular area; and whether the country was originally bush-clad or not.

The map accompanying this report shows approximately the type of pasture existing and the method adopted of recording such pasture types. The final map will be reproduced in colour and will show more detail. The pasture survey is a "stocktaking" of our grasslands and should be the basis for all future research and extension into pasture work of the Dominion.

FEED FLAVOUR IN CREAM.

The work in the Waikato has been continued during the past season, but the results secured, while satisfactory in some respects, were disappointing in a few instances owing to the lack of adequate co-operation on the part of a few of the farmers. The work at Frankton, Te Awamutu, and Morrinsville was affected by staff changes and shortages in personnel. The findings during this season corroborated those of the previous season, but little fresh information has been gained.