

Chemical analysis of herbage: No analyses have been made to date, on account of lack of equipment. A start is being made in April in the collection of material for chemical analysis.

Extension of work on mowing system: The method is so promising as a means of studying production at *all seasons of the year*, that it is necessary to investigate further a number of problems on which information is required. A meteorological station should be established in conjunction with the work.

(b) *Sheep-grazing Trial*.—This trial was commenced in August, 1928. Eight fields, each about three-fifths of an acre, are used for measurement. Four fields are under phosphate treatment, and four are under phosphate plus nitrogen. In addition, there are two auxiliary areas on which the sheep run when there is no grazing on the plots. As far as possible, a permanent flock of sheep is run on each series of plots. This has been rendered difficult, because the stock are supplied by the owners of Marton and are taken away from time to time and supplemented by other sheep. Extra sheep are brought on to the plots when the permanent sheep cannot control the herbage. The permanent sheep have been weighed monthly since October, 1929.

A full analysis of the trial has not yet been made, but some outstanding features are as follows: (1) Full utilization of herbage has been achieved by careful attention to growth on fields and manipulation of stocks. (2) During the period September to January, inclusive, a system of about two days on and six days off each field provided the necessary rotation. (3) If growth is allowed to go for more than six days in the high-production period, there is loss through fouling by stock, and proper control cannot be effected. (4) Sheep which were kept continuously under the grazing-system from May until January, inclusive, have done exceedingly well, and increased in weight from an average of 79 lb. per head to 114 lb. per head live weight. The sheep were about nine months old when first put on plots. (5) The carrying-capacity has been greater during the second summer of the trial than during the first. This may be due in part to climatic conditions, but it is undoubtedly partly due to effect of system of management in the pastures. (6) There was practically no grazing during March, 1929. April and May gave sheep days equal to a carrying-capacity of about five sheep per acre. In June this rose to seven sheep per acre, and gradually increased to nine and eight in August and September respectively. During October, November, December, and January, twenty, twenty-three, twenty-three, and twenty-three sheep per acre were carried in the respective months.

These figures indicate the potentialities of grassland under a system of full utilization of herbage under intensive rotational grazing, and at the same time give some idea of the difficulties of adjusting the stock and hay-silage conservation factors. The trial points very strongly to the desirability of acquiring a farm on which a system of really intensive management of good pasture, with conservation of silage and hay, should be put into practice, and investigated from the economic and practicability aspects. Fat-lamb raising should be the objective. The pasture used in the trial cannot be regarded as a high-class one, and pastures with more true perennial rye-grass should do better in the autumn and winter months.

(c) *Trials to observe the Effect of different Forms of Nitrogen on Pasture*.—Two such trials commenced in 1928, and are being continued. Two different forms of nitrogen, three ammonium phosphates, and one Nitrophoska are under observation. The plots were botanically analysed in the spring. The chief features are: (1) There is not a big difference between different forms of nitrogen in their effect on growth. (2) Calcium cyanamide has a very undesirable effect of "yellowing" all herbage for two or three weeks after application. (3) Sulphate of ammonia causes a diminution in clover. The relationship of lime to this is being observed.

(2) *Ruakura Farm of Instruction, Auckland.*

Measurement of Pasture-production throughout the Year by Mowing with a Lawn-mower.—This trial was commenced in June, 1929, and is an extension of (1) (a) above. It aims at a determination of the effect of winter, spring, summer, and autumn applications of superphosphate. Applications of nitrogen in autumn and winter is also included. The responses to phosphate has been comparatively small, due probably to the fact that the whole area was dressed with $2\frac{1}{2}$ cwt. of super in April, 1929. The winter application of nitrogen gave a very large increase, which continued to November, when the yield fell away to a little below that of a corresponding plot, which received no nitrogen.

(3) *Winton Experiment Farm.*

A similar trial to that at Ruakura—see (2) above—was commenced in June, 1929. The production on this area has been very slow, largely due to the fact that there is very little rye-grass in the sward. Nitrogen applied in the winter caused a big increase, which persisted until December, after which production fell slightly below that of a corresponding "no nitrogen" plot.

(4) *Christchurch Technical College.*

Co-operative trial. This is also a study of time of applying super. The field was sown in October, and the first dressing of plots took place in March. No weighings have yet been made.

DISCUSSION OF EXPERIMENTS UNDER B.

Grassland Investigation and Demonstrations being carried out by Fields Officer of the Fields Division.

(1) *Grazing Trials on Dairy-farms*.—Most of the eighty trials being conducted in the North Island were continued, and about fifteen were inaugurated in the South Island, principally in Southland. Each of these trials consists of the trial of one paddock receiving phosphate against another paddock receiving phosphate + nitrogen. Each paddock was originally half of the same field. The nitrogen has been supplied by Imperial Chemical Industries, which organization has again contributed about 70 tons of nitrogenous fertilizer for the coming season. The application of nitrogen has been confined