

The results given in Table III show the value of nitrogenous fertilizers in producing extra feed at the beginning of the season. In each case, however, a drop in production relative to the no-nitrogen plot occurred at the conclusion of the first period of fifty-six days wherever the nitrogenous fertilizers were used. This drop in production was greatest where ammonium sulphate was employed, and less in the case of Calnitro and Nitrochalk.

An improvement in growth occurred later in the season on all plots where nitrogenous fertilizers were used, but the total production of the nitrogen plots in certain instances fell below that of the no-nitrogen plots. The reduction in yield was greatest where ammonium sulphate was used.

The chemical analyses of samples of mixed pasture taken from the plots regularly throughout the season have shown the great effect of climate on the percentage composition of the pasture. High figures for phosphoric acid, nitrogen, potash, and soluble ash were found in the early spring samples when moisture conditions were favourable. During the droughty period the percentages of these constituents fell greatly, minimum figures being obtained during January and February. The percentages of these constituents rose in the autumn period after rain had effected improvement in growth. The lime figures, on the other hand, were lowest in the spring period, increased to a maximum during January, February, and March, and then fell in the autumn period. The chemical analyses showed that the more important effects of pasture treatment with nitrogenous fertilizers were as follows: (1) The influence of manurial treatment on the chemical composition of mixed pasture was most marked in the case of the plots treated with ammonium sulphate alone. Nitrochalk gave the smallest increase in yield and showed the least effect on the chemical composition of the pasture. Calnitro and a mixture of equal proportions of finely ground limestone with ammonium sulphate occupied an intermediate position in respect to their effects on the composition of the pasture. (2) In the case of all the nitrogenous fertilizers the lime content of the pastures was depressed, particularly in the spring samples following the application of the fertilizers. The percentage of phosphoric acid, potash, nitrogen, and soluble ash were all increased by the use of nitrogenous manures, particularly the yield during spring and early summer. In midsummer the percentages of phosphoric acid, potash, and nitrogen were slightly higher on the control plots (super and potash) than on the plots which in addition to the super and potash received nitrogenous manures. In the case of the nitrogen percentages, lower figures for the nitrogen plots continued not only during midsummer, but also during the autumn.

GENERAL.

During the year under review the following papers have been published or have been prepared for publication:—

Published—

- No. 17: "Influence of Season and Nitrogenous Fertilizer on the Inorganic and Organic Sulphur Contents of Perennial Rye, White Clover, and Mixed Pasture," by H. O. Askew and L. Bishop.
- No. 18: "The Detection and Approximate Estimation of Soil Contamination in Pasture Samples, with Special Reference to the effect on the Iron Content of Pasture," by H. O. Askew.
- No. 19: "Influence of Season and of Ammonium Sulphate on the Chemical Composition of Perennial Rye-grass and of White Clover," by H. O. Askew.
- Miscellaneous: "Pasture Research in Nelson District," by T. Rigg and H. O. Askew.

Prepared for publication—

- No. 20: "The Occurrence of Cyanogenetic Glucosides in Nelson Pasture Plants," by T. Rigg, H. O. Askew, and E. B. Kidson.
- No. 21: "The Estimation of Hydrocyanic Acid in White Clover Samples," by H. O. Askew.

PAKIHI SOILS RESEARCH.

FIFTH ANNUAL REPORT OF THE PAKIHI INVESTIGATIONS CONDUCTED BY THE CAWTHRON INSTITUTE.

(Period 1st April, 1932, to 31st March, 1933.)

During the period under review the small pasture plots laid down in previous years to test the effect of different amounts of lime and of phosphate, and of different methods of seed-bed preparation in the establishment of pasture have been continued. In those cases where the full treatment of lime and phosphate has been applied and where top-dressing with superphosphate has been undertaken good results continue to be obtained. The plots which are cut for hay have also given heavy yields in those cases where superphosphate at the rate of 2 cwt. and sulphate of potash at the rate of 1 cwt. per acre have been employed each year for top-dressing.

Mention was made in the last annual report of an attempt to establish 25 acres in pasture on the Sergeant's Hill area. The pakihi in this locality have a deeper soil than those at Bald Hill or on Skilton's property located on the other side of the Buller. It therefore seemed desirable to conduct a small trial with dairy cows in the Sergeant's Hill area. Ten acres were sown in April, 1932, and a very good take of grasses and clovers was obtained. During the past season the sowing of the 25-acre block has been completed, and arrangements have been made with Mr. C. Lemon to stock and whole of this area next season.