MINERAL CONTENT OF PASTURES

INVESTIGATIONS AT CAWTHRON INSTITUTE

Field Trial at Sherry River

This trial was commenced in the spring of 1941 to compare the effectiveness of applications of 2 oz. and 4 oz. of cobalt sulphate per acre, the first amount to be given in each of two seasons, while the second was given only in the first season of the experiment. A plot treated in August, 1940, with cobaltized superphosphate and receiving no further applications of cobalt since that time was also available, together with a control area on which no cobalt had been used. While at the end of the first season the animals on the area top-dressed with 4 oz. cobalt sulphate per acre were slightly better than those on the 2 oz. area, at the end of the second season those on the 2 oz. area (with two applications at this rate) were better than those on the 4 oz. area. In both cases all the sheep on these two areas at the completion of the experiment in July, 1943, were in good health, all except one being in fat condition. Sheep on the cobaltized superphosphate area did the best of all. On the control area some losses occurred and surviving sheep were in poor condition. The following average live-weights at the end of the season illustrate the effects of the various treatments: Control, 69·8 lb.; 2 oz. cobalt sulphate per acre, 127·2 lb.; 4 oz. cobalt sulphate per acre, 114·4 lb.; and cobaltized superphosphate, 153·8 lb.

As a continuation of this experiment, another was begun in the spring of 1943 to run over two seasons to compare the effectiveness of 4 oz. and 8 oz. cobalt sulphate per acre applied only at the beginning of the trial. To date no differences in live-weight have been noted, although the sheep on the 8 oz. area have the better appearance.

Mowing Trial

(*a*) *Soil Analysis.*—Determinations of exchangeable base content of samples taken at 0–2 in., 2–4 in., and 4–6 in. from the plots receiving different fertilizers with or without magnesium compounds present and also with or without further applications of muriate of potash have been carried out. Complete sets of samples were taken on three occasions during the course of the experiment. The results of analysis show that on the experimental area there were great decreases in the exchangeable lime and magnesia contents with depth and a marked decrease in exchangeable potash. Increases in exchangeable ions following the applications of magnesium compounds or of potash have not been demonstrated with certainty in all cases.

(*b*) *Pasture Analyses.*—Owing to the large number of samples obtained during the mowing trials, composite samples have been used for the analytical work. Some appreciable differences in chemical composition have been noted in the various samples. For example, the application of the muriate of potash markedly increased the potash content of the pasture, especially in the second season. The nitrogen content was increased also, but this may be a secondary effect following the increased clover growth on the potash-treated plots. Potash also seemed to reduce slightly the magnesia and phosphoric-acid contents of the mixed pasture. The use of serpentine superphosphate and superphosphate with added magnesium carbonate or magnesium sulphate resulted in slight increases in the magnesia content of the pasture.

Pot Trial with Serpentine Superphosphate

A pot trial employing a sandy loam soil from Sherry River was set up to compare the effects of certain treatments:—

Treatment.	Relative Yields on Dry-weight Basis.
(i) Control (no manure)	100
(ii) Superphosphate	297
(iii) Basic super (made with $Ca(OH)_2$)	305
(iv) Serpentine superphosphate	403
(v) Superphosphate and serpentine, added separately in amounts equivalent to (ii) and (v)	375
(vi) Superphosphate plus limestone	320

Western Wolths was used as a crop.

These results show that the greatest growth of Western Wolths followed the use of serpentine superphosphate, the next best yield being given by superphosphate and serpentine added separately. The other phosphates gave essentially the same yields.

Samples of grass from these pots have been reserved for chemical analysis for observations on intake of phosphate.

MINERAL RESOURCES COMMITTEE

Personnel.—Dr. E. Marsden (Chairman), Mr. C. H. Benney (Deputy Chairman), Mr. R. L. Andrew, Mr. W. M. C. Denham, M.P., Mr. W. Donovan, Dr. J. Henderson, Mr. R. F. Landreth, Mr. E. O. Macpherson, Mr. F. J. A. Brogan (Secretary).

The Committee continued to supervise and co-ordinate field surveys and laboratory investigations of mineral resources, especially those of wartime and industrial importance, carried out by the Geological Survey, the Dominion Laboratory, and the Mines Department. Three meetings were held during the year.

Clarendon Phosphate Deposits.—A geologist directed the prospecting and boring of these deposits during the year and estimated the depth and probable extent of the phosphate-bearing horizons in selected areas. A geological report discussing the origin of the deposits and summarizing the present knowledge of their quality and extent has been prepared for publication. There are indications that the phosphatic horizons may extend considerably farther afield than the Clarendon area.