

## II. COBALTIZED FERTILIZERS.

Our work on the commercial manufacture of cobaltized fertilizers has been continued. Through the courtesy of Messrs. Kempthorne and Prosser, Dunedin, a new batch of 15 tons of cobaltized superphosphate containing 0·10 per cent, cobalt has been prepared. Cobalt monoxide was used in the manufacture of the cobaltized superphosphate, which on analysis showed over 90 per cent. of the cobalt to be present in a water-soluble state.

Pasture trials have again shown the value of cobaltized fertilizers in increasing over lengthy periods the cobalt content of the pastures and in maintaining stock health on pastures which formerly were unsatisfactory for stock.

Some interesting data are now available concerning the effect of different amounts of cobaltized fertilizers in increasing the cobalt content of pastures and of supplementary fodder crops.

On a pasture at Stoke, Nelson, a top-dressing containing 2 lb. of cobalt chloride per acre gave a very marked increase in the cobalt content of the pastures for at least one year, while top-dressings containing 10 lb. of cobalt chloride per acre resulted in enhanced cobalt figures for the pasture over a period of more than two years.

At Sergeant's Hill, Westport, the use of 1 cwt. cobaltized superphosphate (containing 0·20 per cent. cobalt (Co) ) per acre resulted in a fourfold increase in the cobalt content of the pasture five months after top-dressing. In this experiment the cobalt content of the pasture a year later was found to be double that of the untreated pasture.

At Morton Mains pasture analyses have shown the great value even of small dressings of cobalt salts in increasing the cobalt content of the pastures. Typical results are shown in Table I:—

TREATMENT PER ACRE (applied 24/11/38).						TABLE I. Cobalt Content of Pasture. on 2/2/39. p.p.m.	
Control (no cobalt)	..	..	..	..	..	..	0·04
$\frac{1}{4}$ lb. cobalt chloride	..	..	..	..	..	..	0·08
$\frac{1}{2}$ lb. cobalt chloride	..	..	..	..	..	..	0·16
2 lb. cobalt chloride	..	..	..	..	..	..	0·37

Interesting results have been obtained in connection with the use of cobaltized fertilizers for supplementary fodder crops such as oats, rape, turnips, and swedes. Experimental plots at Morton Mains, Southland, and at Stoke, Nelson, have shown that the cobalt status of these crops is greatly improved by use of cobaltized fertilizers. Typical results are shown in Table II:—

TABLE II.

Treatment per Acre.						Crop.	Cobalt Content (p.p.m. Dry Matter).
2 cwt. super	..	..	..	..	..	Garton oats	0·005
2 cwt. cobalt-super (0·2 per cent. cobalt)	..	..	..	..	..	Garton oats	0·03
2 cwt. super	..	..	..	..	..	Rape	0·03
2 cwt. cobalt-super (0·2 per cent. cobalt)	..	..	..	..	..	Rape	0·07
2 cwt. super	..	..	..	..	..	Turnip tops	0·04
						Turnip bulbs	0·03
2 cwt. cobalt-super (0·2 per cent. cobalt)	..	..	..	..	..	Turnip tops	0·16
						Turnip bulbs	0·15

## III. SEASONAL VARIATION IN COBALT CONTENT OF PASTURES.

Studies of the seasonal variation in the cobalt status of typical Nelson pastures have been continued. Periodical samplings have been made from enclosed pasture plots on four healthy soil types. With one exception the cobalt status of the four pastures was somewhat similar, the average cobalt content falling between 0·08 p.p.m. and 0·11 p.p.m. In the fourth case the average cobalt content for the season was 0·21 p.p.m., the higher cobalt content being in keeping with a much higher cobalt status of the soil.

For the greater part of the season the samples from any one of the selected pastures did not show a great variation in cobalt content. The early spring samples tended to be higher and the autumn samples lower than the seasonal average content of cobalt. Variations of 0·17 p.p.m. to 0·06 p.p.m. cobalt represented extreme values for three out of the four pastures.

## IV. ANIMAL TRIALS.

Excellent results have been obtained at Glenhope, the Sherry Valley, and at Westport by the use of cobalt supplements and cobaltized fertilizers.

At Glenhope bush-sick sheep have been cured of ailment and maintained in perfect health for a period of two years by top-dressing the pastures with 2 cwt. of superphosphate containing the equivalent of 2 lb. of cobalt chloride per acre. Good results have likewise been obtained from cobalt phosphate which was used on a small portion of another grazing area at the rate of 5 lb. per acre.