In a number of cases the chemical data showed conclusively that the pastures were deficient in one or more constituents. The data were in keeping with the known history of the pastures which had been found unsatisfactory for stock.

Several reputedly deficient pastures in localities not previously visited have been examined, and in several cases marked deficiencies in the composition of the pastures have been revealed. In the following table (Table 1) analytical data in connection with samples from Rainy River, Sherry Valley, and Tui localities are given. The analytical data show that deficiencies of phosphate occur in samples collected in both the Sherry Valley and Tui localities. The percentage of lime is rather low in all the samples, but at the present time there is not sufficient evidence available to make a definite statement in regard to the lime status of the pastures.

In the case of the samples from the Rainy River, stockmen state that cattle do not thrive and decline slowly in health. The analytical data for these samples show that the pastures are comparatively well supplied with phosphate; the percentage of iron is low. Further samples must be examined before any pronouncement can be made concerning the cause of stock ailment in this locality.

Table 1.—Chemical Composition of some Abnormal Nelson Pastures.

	Rainy River.		Sherry Valley.		Tui.	Average for Good Nelson Pastures.
	Alluvial Flats.		Heavy Loam (Granite Wash).	Alluvial Sandy Flats.	Moutere Gravels.	
Laboratory No.	133.	134.	165.	166.	168.	
Lime (CaO)	0·60	0·60	0·65	1·07	0·61	0·83
Phosphoric acid (P_2O_5) ..	0·98	0·94	0·31	0·49	0·45	1·06
Potash (K_2O)	3·31	3·28	2·26	3·04	2·58	3·96
Soda (Na_2O)	0·12	0·07	0·13	0·37	0·24	0·49
Chlorine (C_1)	0·81	0·74	0·51	0·66	0·60	1·45
Nitrogen (N)	4·12	3·68	2·17	2·99	2·40	5·34
Sulphur (S)	0·30	0·25	0·18	0·18	0·20	0·43
Iron (Fe)	0·012	0·014	0·025	0·032	0·012	0·033
Manganese (Mn)	0·021	0·032	0·028	0·021	0·035	0·017
Total ash	8·59	8·02	8·32	8·81	8·63	11·69
Soluble ash	6·27	6·08	4·44	6·70	5·11	9·10
Insoluble ash	2·32	1·94	3·88	2·11	3·52	2·59

NOTE.—All percentages are on dry matter. Samples represent young green growth collected spring, 1928.

II. Effect of Season and Fertilizer on the Yield and Composition of Nelson Pastures.

A very detailed study has been made of the various factors influencing the yield and chemical composition of a typical dairying-pasture at Richmond, Nelson. The investigation is still in progress, but much of the data obtained during the first year has been prepared for publication.

The more important conclusions resulting from this very detailed investigation are given below under the following headings: (*a*) "Effect of Season and Fertilizer on the Yield of Hay, Aftermath, and Pasture"; (*b*) "Effect of Season and Fertilizer on the Chemical Composition of Hay, Aftermath, and Pasture." A study of soil conditions on the pasture-plots has been included in the investigation, but the results have not yet been prepared for publication and on this account are not considered in this report.

(*a*) *Effect of Season and Fertilizer on the Yield of Hay, Aftermath, and Pasture (Mown Cuts).*—This section of the investigation deals with the relationships existing between climatic factors, such as temperature and rainfall, and yield of pasture. Production of dry matter in hay and aftermath crops is compared with the yield of dry matter from pasture frequently mown, so as to correspond with a rotational system of grazing under the same manurial treatment. The following summary covers the more important conclusions derived from this section of the investigation:—

(1) Nitrogenous and potassic manures have given greatly increased yields of hay over a period of six years. Superphosphate used alone has had little effect on the yield. A complete manure consisting of 2 cwt. superphosphate, ½ cwt. sulphate of potash, and 1 cwt. ammonium sulphate per acre has given an average annual increase in hay of 10·6 cwt. per acre over the untreated plots.

(2) In the Nelson District cold temperatures, accompanied by a great reduction in the hours of sunshine, are greatly responsible for low pasture-production during the period commencing 18th April and ending about 1st October. During the months of June and July it is very probable that no growth occurs in the case of a pasture which has been frequently mown the previous season. For the whole winter period, 6th May to 8th August, the production of dry matter from the untreated plots averaged only 1·4 lb. per acre daily. During the early spring period, 8th August to 5th September, production of dry matter rose to 5 lb. per acre daily. After this date a very rapid rise in rate of