

The varying percentages of HCN produced in different samples of clover suggest the possibility of many factors operating in controlling cyanogenetic glucoside formation in these plants. It seems probable that soil-type, climate, growth stage, and strain of clover are all connected with the varying percentages of HCN found in the present investigation.

During the conduct of the estimations of hydrocyanic acid in the laboratory it became clear that standardization of technique for HCN determinations in plant material was highly desirable. The opportunity was taken by Dr. H. O. Askew to study sampling and laboratory conditions for the estimation of potential I.CN production in white clover. The effect of temperature, duration of fermentation, the effect of dilute acid and alkali on yield of HCN have all been studied, and a paper has been prepared for publication dealing with this work.

### III. EFFECT OF NITROGENOUS MANURES ON THE YIELD AND CHEMICAL COMPOSITION OF TYPICAL DAIRYING PASTURES.

During the period under review the results of the pasture trials located at Appleby have become available. This experiment was commenced in 1930 and was continued for two complete seasons in order to increase the reliability of the results. The experiment was designed to test the effect of different nitrogenous manures on the yield and chemical composition of a good rye and clover pasture. A base treatment of superphosphate and sulphate of potash was given to all plots previous to the application of the nitrogenous manures.

During the first year three applications at the rate of 1 cwt. per acre on each occasion were made of (a) Calnitro, (b) Nitrochalk, (c) ammonium sulphate, (d) ammonium sulphate plus an equal quantity of calcium carbonate. In the second year of the experiment the quantity of nitrogenous manures was reduced to a single application of  $1\frac{1}{2}$  cwt. in each case applied in the early spring.

The production of dry matter during the two seasons is shown in Table II below.

Table II.

Treatment.	Yield Dry Matter (Pounds per Acre).	
	Season 1930-31.	Season 1931-32.
No nitrogen .. .. .	4,077	4,654
Nitrochalk .. .. .	4,308	4,656
Calnitro .. .. .	4,486	4,830
Ammonium sulphate .. .. .	4,473	4,606
Ammonium sulphate plus calcium carbonate .. .. .	4,430	4,492

During the first year of the experiment a significant increase in production of dry matter resulted with each nitrogenous fertilizer. The greatest increase was shown by Calnitro and ammonium sulphate; the effect of Nitrochalk applied at the same rate was not so pronounced. During the first year when three applications of nitrogenous fertilizers were made the greatest increase in pasture production resulted from the spring application of the nitrogenous fertilizers. The November application gave only a small increase, the January application being intermediate in effect between those already mentioned. It must be remarked, however, that droughty weather was experienced in November and during mid-summer. The total increase in yield from the three applications of nitrogenous manures resulted in an increase in dry matter of approximately 400 lb. per acre in the case of Calnitro and of ammonium sulphate.

During the second season only one application of the nitrogenous fertilizers (at the rate of  $1\frac{1}{2}$  cwt. per acre) was made in order to study more closely the after-effects on yield resulting from the use of these fertilizers. In Table III the yields of dry matter for (a) the initial period when increase in yield was obtained from the nitrogenous fertilizers, (b) the remainder of the season when a depression in yield was noted, and (c) the full season.

Table III.—Production of Dry Matter, Season 1931-32.

Treatment.	Pounds per Acre.			Increase over No Nitrogen.		
	First Period : August 4th to September 29th, 1931.	Second Period : September 30th, 1931, to May 16th, 1932.	Full Period.	First Period.	Second Period.	Full Period.
Super and potash .. .. .	843	3,811	4,654	..	..	..
Super plus Calnitro .. .. .	1,067	3,762	4,830	224	— 49	176
Super plus Nitrochalk .. .. .	968	3,689	4,656	125	—122	2
Super plus ammonium sulphate .. .. .	1,055	3,551	4,606	212	—260	— 48
Super plus ammonium sulphate plus calcium carbonate .. .. .	1,003	3,489	4,492	160	—322	—162

NOTE.—One application only of the nitrogenous manures was made at the rate of  $1\frac{1}{2}$  cwt. per acre early in August, 1931. Super was applied at the rate of 3 cwt. per acre and sulphate of potash at rate of 2 cwt. per acre in July, 1931.