

## CHEMISTRY SECTION.

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## DEFICIENCY DISEASES OF LIVE-STOCK.

*Bush Sickness.*—No further trouble has been reported since only limonite prepared in an approved manner from approved sources has been marketed for stock-lick purposes. There is still considerable scope for extension in the use of this material, especially in the Bay of Plenty, where the practice of administering iron and ammonium citrate became so firmly established as to make some farmers hesitant in adopting a new remedy even on the score of much greater cheapness and ease of administration.

Mr. C. R. Taylor, in charge of the work at Rotorua, reports :—

"Were it not for the setback due to the drought it is safe to say a record production of butterfat would have resulted. The number of fat lambs sent to the works from all parts of the district has increased enormously over last year's output. The sale of fat ewes and wethers has also greatly increased. The health of all stock has been markedly good and the freedom from bush sickness most noticeable.

"Once again the wonderful condition of local stock at the recent Tokoroa Show testified to the efficacy of limonite as a cure for bush sickness.

"During the year limonite from the Ruatangata deposit has most certainly lived up to the reputation established in the Atiamuri experiment, 1931.

"The sheep experiment at Kaharoa was terminated in February, it having been demonstrated that sheep and lambs could be kept healthy on this, the worst, class of country with the aid of limonite. In the earlier part of the experiment trouble has been experienced from ragwort-poisoning and the use of ineffective limonite, but for the last fourteen months the sheep kept in good condition and there were no losses of lambs. Several ewes bred on the place (now 6-tooth) are in show condition. On the same farm the dairy cows have now been receiving no other treatment but limonite for over three years, and it would be difficult to find better-conditioned animals anywhere. Eight years ago it was necessary to change this herd to healthy pasture three or four times a year. No trouble is experienced in rearing calves, and the yearlings are a picture of health and vigour. The Tokoroa district is now reflecting the excellent influence of limonite on stock and through this the relatively high productiveness of the bush-sick pumice country. Not a few of the Tokoroa herds will finish up the present season with the splendid average of nearly 300 lb. of butterfat per cow, grazing one cow to 1½ acres. The cheese-factory found it necessary to utilize its full number of vats (five) for the first time. Approximately the same number of cows are supplying the factory as last year.

"In Waotu, Puketurua, and Lichfield districts stock-owners have been perfectly satisfied with the results obtained from the use of limonite. Ewes and lambs have done remarkably well, and some very fine results have been obtained. One farmer from 1,600 ewes had 1,750 lambs, and of these all but twenty were sold as fats. Another farmer, who in the past has had extremely heavy losses in sheep, this year shipped to England 3,600 lambs out of 4,000. The wool-clip was also much heavier."

Very heavy losses from bush sickness were experienced a few years ago in the areas around Kopaki and Mangapehi, south-east of Te Kuiti. Several of the larger sheep-stations have now adopted the use of limonite with remarkable results.

On the Government-owned Tapuwae Estate it is reported that all the sheep came out of the wool well, with an increase of 30 bales of wool over the previous season. Not more than a dozen sheep out of the 3,000 shorn were in other than a thriving condition. There were no weeping eyes noticed amongst the lambs, although at the same time the previous year practically all were affected. In a further report received through the courtesy of the Lands Department it is stated *inter alia* :—

"Hitherto the accepted practice on the local bush-sick properties has been to change all stock at least annually, the resultant loss in depreciation and restocking being considerable.

"Definite proof of the success of the remedial measures practised on Tapuwae is the fact that this season ewes bred on the property have produced a good crop of lambs showing no symptoms of bush sickness. The success obtained has been the result of many and varied experiments, of which the breaking-in of the sheep to a limonite-salt lick has been the most successful. Probably the best indication of the success achieved has been the turning-off of over 3,000 fat sheep during the past season, one line of 1,100 wethers averaging 69.3 lb. when killed at Waitara. Cattle also have responded well to the treatment, as instanced by the fact that 816 bullocks have been fattened during the past three seasons.

"The property now winters 4,250 sheep and 700 head of cattle, and it is hoped in a few years to increase this carrying-capacity."

The general position in regard to bush sickness in the areas formerly most seriously affected may be judged by the following quotation from an article in the *Rotorua Morning Post* of 20th February, 1935 :—

"Although it has not been done with any spectacular flourish of trumpets, but in the course of careful and detailed research work, it may now definitely be claimed that the Rotorua-Tauranga-Mamaku pumice country is almost entirely free from bush-sickness.

"Officials of the Department of Agriculture who have been engaged for some years in investigating this stock malady and experimenting with methods of cure state that definite cases of bush sickness are now rare. So much so that when Sir Arnold Theiler, one of the world's leading authorities on mineral deficiencies, visited Rotorua before Christmas, efforts to find bush-sick animals for his inspection in the Rotorua, Tauranga, Matamata, and Mamaku districts were unsuccessful, despite the fact that the incidence of bush sickness had previously been most marked during the months of December and January.

"Five and six years ago large areas of country in different parts of the district were definitely 'sick,' but this has now become a thing of the past. As an example, stock-shows are now being held at Tokoroa, which was previously one of the most seriously affected districts in the whole area. Where at one time hundreds of stock were annually affected by the malady, now months pass without even a single case being reported.

"A great deal of this improvement is definitely due to the 'limonite cure,' and limonite is now firmly established and generally used as a counteractive preparation. Broadly speaking the experimental work carried out has shown that sickness is caused by lack of iron in the soil, and this deficiency limonite is designed to remedy. Citrate of iron was also largely used for this purpose, but at the present time the demand for it