

POTASH IN PASTURE TRIALS

Everyone in this room knows the difficulties associated with fertiliser trials of all descriptions. And perhaps pasture trials are, of all of these, the most intricate. In their nascent stage they constituted a simple enquiry into the growth-result following upon the application of the material employed.

Later) other considerations entered into the scheme. Amongst these were, rapidity of response and its maintenance, the related effect of special climatic conditions and the significance of the form and mechanical condition of the fertilisers employed.

But more recently still the importance of the composition of the pasture-food and its metabolism, the result of varying fertilising treatment, have engaged attention.

Of the several elements of growth generally employed in fertiliser trials, potash is probably the most difficult to evaluate in effect,

That is thought to be so for several reasons. The high power of absorption of potash possessed by most soils must always be a factor. Apparently too, the diffusive properties of potash vary markedly under different conditions, of soil, temperature and moisture. Yet it is less in these respects than in another that potash experiments on pastures present their major complication.

Differences exist in the appeal and value to the beast of grasses and clovers which have not yet been traced to their source.

It does seem reasonably certain that taste plays no inconsiderable part in the grazing preference of stock, and it is common enough to find potash-treated pasture, which to the

closest human observation presents no special feature, heavily grazed in a fashion which irresistibly suggests a strong predilection on the part of the animal. As has been suggested, this may be due to a taste-difference, or again to an instinct which informs the beast that pasture with a high potash content is of special value to it in its productive processes. It is, indeed, not impossible that both taste and instinct govern this phenomenon,

Schneider-Kleeberg dealing with this matter in the German Journal "Pasture and Fodder Crop Cultivation" (1932), speaks of the reluctance of animals to feed upon summer grass, which has, in the preceding spring been manured 'with farmyard manure, deducing therefrom that the pasture food accepts the taste and even the odour of that manure. He goes on to point out that in his experience kainit or potash salts and in lesser degree, phosphates and lime have enhanced the taste appeal of the pasture,

It has frequently been suggested to the writer that it may be to the common salt content of kainit or potash salts, that one can look for an explanation for this taste preference.

This does not seem very probable, firstly because sulphate of potash which at most contains a mere trace of sodium chloride, is just as effective as kainit in this respect, but secondly since the special palatability of potash treated pasture has been shown to exist for years after an initial heavy dressing; that is to say, long after all trace of the common salt content of the loner chloride combinations must inevitably have been moisture-carried far down into the soil.

Thus, in pasture trials, when potassic treatment is under examination, there are nuances not encountered- or to be calculated upon in research peculiarly aimed for example, in the direction of discovering the optimum form of phosphatic application,

A circumstance came under my' notice a few months ago, which

seems not without bearing, when the inscrutability of potash effect under conditions of casual inspection, is being considered.

On the property of a very well known North Taranaki farmer, Mr. J. H. Paulger, Tikorangi, "bloating" in the early weeks of last spring caused a certain degree of anxiety. It happened that Mr. Paulger had dressed one paddock massively with 30% potash salts. These were applied in the autumn, at the rate of 4 cwt. per acre - in addition to his customary farm application of phosphates. Lesser potash dressings were given to the rest of the farm.

Now it was only on the paddock treated so generously with potash that complete immunity from "bloat" was observed, and reported on by Mr. Paulger. The rye-white-clover growth on that paddock was particularly luxuriant, and yet it was possible to turn the cows into it, without the necessity of watching for incipient signs of the "bloating" which elsewhere on the farm called for constant attendance?

J. H. Paulger is, I am aware, well known personally to a number of the gentlemen present, and so they will endorse my conviction that he does not form opinions loosely, nor utter statements in which he has not complete confidence.

It will be remembered that, last year, following upon a rather trying winter, specially favourable weather heralded a remarkably luxuriant and rapidly grown spring flush.

It is suggested then as an explanation of the "bloat" immunity on the paddock heavily treated with potash, that a better mineral balance, offsetting the gaseous tendency, existed in the clover and grasses so treated, than was general in the pasture of the rest of the farm.

Some day it will no doubt be possible to arrange comprehensive pasture trials in New Zealand specially designed to trace the real effect of applied potassium on a wide variety of soils, taking,

into careful consideration those special potentialities of the element, of which an outline has thus been sketched.

This research may be approached through live weight comparisons of lambs and calves, a systematic record of herd-grazing days, or combinations of these over a term of years. Official work of this nature, has of course, elsewhere than in this country proved valuable and illuminating.

The simple "observational plot" system at present generally relied upon by the Department of Agriculture, is no doubt regarded purely as a preliminary to more radical work, and *faute de mieux*.

Yet the system does contain intrinsic disadvantages.

An "observational" trial, to be of real significance as an indication as to the value of any element of plant-growth, must of necessity indeed be frequently and closely observed.

Were the growth element under consideration, one affording rapidly available nitrogen, that would still be so, when unfenced trial plots are laid down in grazing paddocks.

Greater still, however, is the need when potassic effects are to be thus judged and reported upon.

Unless observational visits at regular and very short intervals take place, it is surely not extreme to say that chance, in the matter of when the stock happen to be off or on the area containing the trial plots, must play an unduly important part in the "observed" appearance of those plots; a part so vital as to reduce seriously in value, one way or the other, the most carefully prepared reports thereon.

The size of "observational" plots seems likely also to be of importance when specially heavy grazing caused by enhanced palatability is to be noted.

A very small area continually punished is likely by fouling, to lose its original attraction to the animals, and thus actually to exhibit evidence of neglect at certain stages, and to an extent

that could easily obscure the facts,

It is generally conceded that it is not easy to adjudge by the eye alone, quite real differences in well grazed pasture growth. On a bright sunny day, for instance, colour lines are evident, which a dull sky can obscure,

No "observational" standard can possibly be fixed, so that it is doubtful if, say, five successive "observers" independently examining the lay out of, perhaps ten sets of "observational" plots on the same day, would in their "placings" of the plots, achieve anything even remotely approaching unanimity. And were the examinations to be spaced by even a few days, the prospect of reproducing the various observations in a dependable report, would seem to be even further prejudiced.

How-ever) the need for systematic research in this country into these and allied matters, will sooner or later bring its own remedy.

Even in the troubled state of the World today, scientists in many lands are delving from every angle into the problems connected with fertilising, and therein at least, lies hope of progress.

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