Facts on Fertiliser

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When fertiliser usage took a plunge between 1965-66 and 1967-68, there was no evidence of any considerable drop on dairy or cropping farms. Neither did usage drop much in the South Island. Most of the drop was on sheepfarms of the North Island and, more specifically, on hill country farms, where reductions of up to 50 per cent occurred.

Fertiliser and dairy production

On a national basis, it seems difficult to predict what is likely to happen when big changes are made in amounts of fertiliser used. Usage and total livestock units are not entirely consistent, although generally a trend is there, i.e. as fertiliser consumption goes up, total stock units go up.

In 1952-53, a survey by Mr A. H. Ward of the New Zealand Dairy Board found that there was a general relationship between fertiliser use and production, but he was unable to trace a close relationship between any particular rate of fertiliser used and dairy production per acre.

Another survey showed that in spite of a 20 per cent drop in the area topdressed during the depression, there was no corresponding fall in production. In fact, total butterfat production rose steeply, while the area topdressed declined. So much for national trends.

Close linkage evident here

On individual farms and smaller scale studies, there appears to be a much stronger relationship: Three examples come to mind here.

(1) A survey by the Dairy Board on 48 high-producing farms in the Waikato in 1965-66 showed that these farmers applied higher than average rates of fertiliser. In 1964-65, production from the farms averaged 384 lb butterfat per acre and in 1965-66, 401 lb fat per acre. Average fertiliser applications in the two seasons were 5.8 cwt and 6.1 cwt/acre respectively. By comparison, the average rate of topdressing in 1965 of 3000 farmers using AB in the Auckland Herd Improvement Association area was 4.3 cwt per acre. Average production on these farms was 260 lb butterfat per acre. Slightly less than ¼ ton of fertiliser was applied for every

1000 lb fat produced on the 48 high-producing farms over the two seasons.

(2) John Graham's thesis study ("Cows, Fertiliser, Production, Profit") of 40 farmers in South Taranaki in 1962 showed a strong connection of production with fertiliser. The main finding of this study was that dairyfarmers in South Taranaki could earn 20 per cent on additional capital by increasing production. It suggested that if you want to get over 300 lb fat per acre, you will probably have to use at least 6 cwt of 33 per cent potassic super and about a cow per acre.

(3) Waimate West demonstration farm has plenty of supporting evidence. An interesting point there is that heavier topdressed areas may result in greater milk production, even though more grass is not produced. This could suggest that chemical composition of the grasses concerned may be such that animals are able to produce more from it.

Extent and pattern of use

Information from AB questionnaires in 1967-68 gave the extent and pattern of fertiliser use. Twelve thousand farmers from all main dairying regions answered the questionnaire. Of these, 97 per cent topdressed their farms in 1967. Average annual dressing was equivalent to 3¼ cwt of superphosphate and 2/3 cwt of potash per acre.

The survey underlined the increasing reliance by farmers on phosphate-potash combinations: 71 per cent of farmers applied super-potash mixtures; 50 per cent straight superphosphate; 5 per cent straight potash; 3 per cent basic slag; 7 per cent nitrogenous fertilisers, and 4 per cent other fertilisers; 23 per cent applied either lime or dolomite.

What happens if you cut down

If fertiliser is reduced or discontinued, pasture will weaken and the clover will not produce sufficient nitrogen, with the result that pasture and animal production will fall. However, where heavy rates of fertiliser have been maintained for many years, and where soil fertility is correspondingly high, reduction of fertiliser will possibly have little effect.

Soil levels of phosphorous and potash tend to build up slowly under a regime of heavy topdressing, but conversely, when fertiliser is suspended, a high reserve of fertility takes a long time to become depleted again.

However, the number of farms with a history of heavy topdressing is small (i.e. farms with 5 cwt/acre or more for 10-20 years could be regarded as in this bracket). Farms at lower levels of fertility virtually live from season to season on the fertiliser applied, and lowered fertiliser here would be noticeable within one or two seasons.

How do you value fertilisers?

The greatest problem facing any farmer is rising costs of production, with its consequent narrowing margin for profit. Fertiliser is a major cost item and must be critically analysed. Many fertilisers are highly priced and price does not always equal value. Under the Fertiliser Act of 1960, all bagged fertiliser has to be branded, not only with the name of the product, but also with the percentage of elements of nitrogen, phosphorous and potassium to the nearest whole number. In stipulating this, Government hoped to encourage farmers to purchase fertilisers on the basis of known plant nutrients and ratios. The following method can be used to assess the relative value of any fertiliser:

Assume that a fertiliser with an N.P.K. rating of 10-18-9, costing $120 per long ton ($5.35 per 100 lb) is considered over-priced. What would these nutrients cost if purchased in bulkier form of sulphate of ammonia, superphosphate and muriate of potash?

A breakdown of costs is given in Table I.

TABLE I

Material	% of element	Approx. cost per long ton	Approx. cost per 100 lb (Divide total by 22.4)	Cost per lb of element (cents) (Divide by % of element)
Sulphate of ammonia (N)	21	$47.00	$2.10	10.0 ($2.10)
				(21)
Superphosphate (P)	10	$23.00	$1.03	10.3
Muriate of potash (K)	50	$36.00	$1.60	3.2

Using these figures as a guide, then the value of 10-18-9 can be assessed.

Element	% content	Cost per lb (cents)	Total cost (100 lb)
N	10	10.0	$1.00
P	18	10.3	$1.85
K	9	3.2	$0.29
			$3.14

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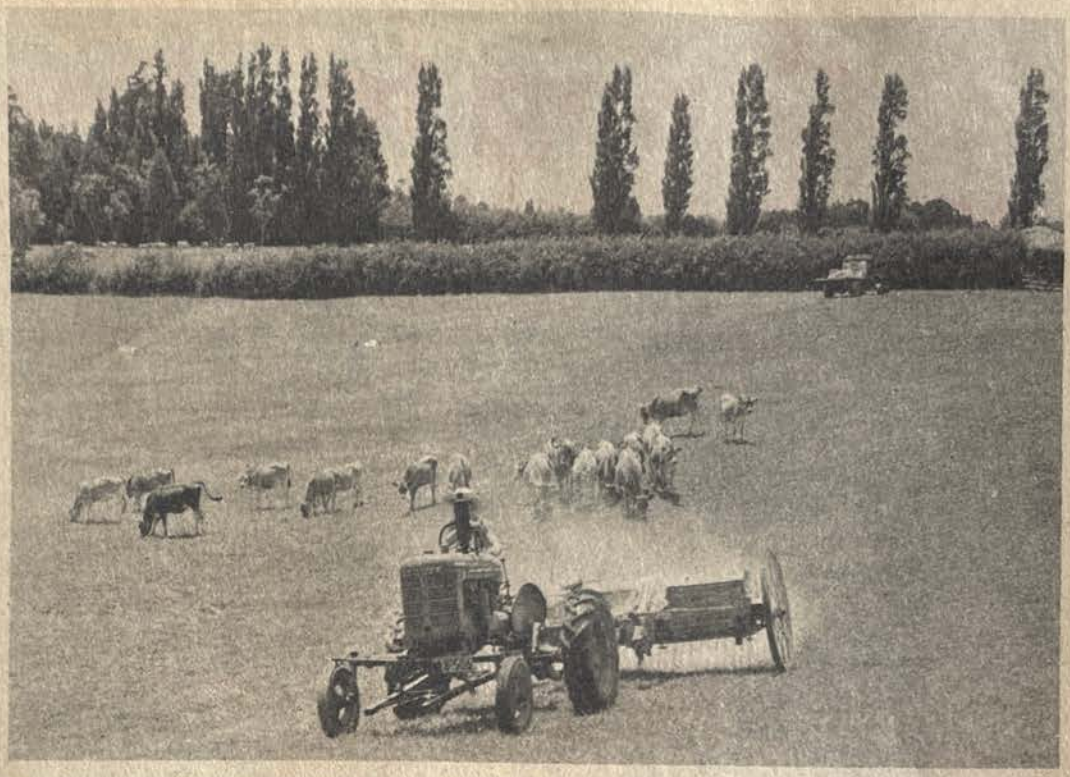
The saving in a sulphate of ammonia, superphosphate and muriate of potash mixture would be about $2 per 100 lb, or $44.80 per long ton, of similar nutrients. Of course, more bulk is purchased and spread and this, plus any other disadvantages, must be accounted for.

Pros and cons summed up

Use of fertilisers is not straightforward in most districts, because of the complex nature of many soils and the influence on the soils of farming practices. However, experiments are likely to prove that traditional fertiliser practices, using potassic superphosphate or similar fertilisers and with special reference to nitrogen, are more efficient and economic for pastoral farming.

There is certainly no room today for wasteful use of fertilisers, but where the ratio between fertiliser applied and stock carried appears to be soundly based, efficiency is more likely to be raised by maintaining fertiliser and stocking rates.



This farmer is topdressing with the stock still in the paddock, a practice which should be avoided if at all possible. Stock—and particularly milking cows—should be kept off newly topdressed pastures where possible, until adequate rains have washed the fertiliser off the grass.