SOME GRASSLAND DEVELOPMENTS DURING THE WAR AND POST WAR PERIOD.

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1. INTRODUCTION:

In a picture that'has been shown to many farming audiences throughout New Zealand there comes the following sentence: "The land has no **value** other than what we give it." The whole of our farming endeavour in New Zealand revolves round the principle of giving the land a value and then maintaining or increasing that **value.**

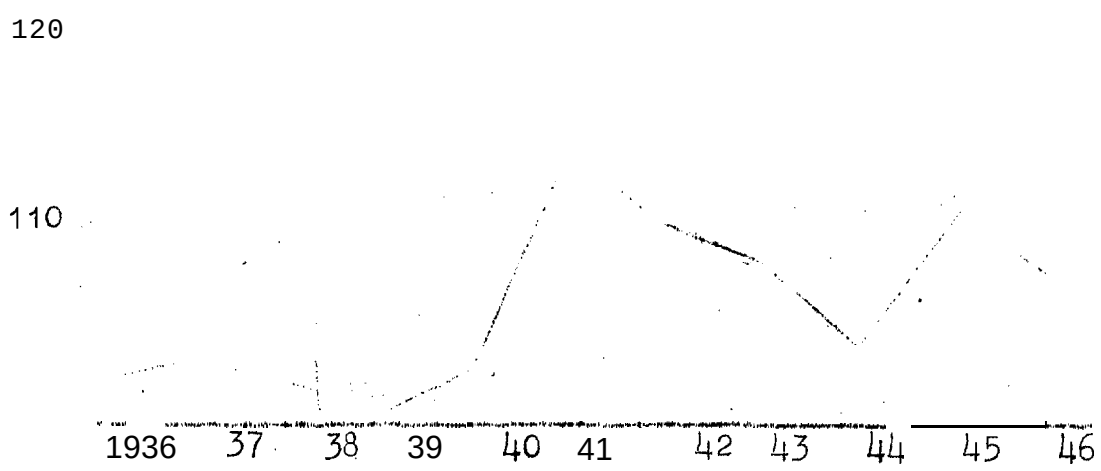
The value of our grasslands can be measured mainly by the amount of animal produce created on and by them. To this animal produce. **must** be added certain other items. Small seed production is an important adjunct to animal produce. There is also that grassland the **value** of which cannot be expressed in terms of money; that is the ever increasing area devoted to recreational and other non-productive activities. Any discussion on grassland trends must therefore, bear in mind that the 'end - use ofgrassland is primarily animal produce. Consequently the value **of** our grasslands and the significance of any trends in their well being can be Evaluated almost entirely in terms of animal produce.

In order to ascertain what these. trends are, full use must, of necessity be made of statistics not only for the period under -discussion, but also for some time both before and after. For these reasons it has been decided to discuss our grasslands and thei production for the. period 1935-36 to 1945-46,using the season 1938-39 as the basic one. throughout,

2. FARM PRODUCTION -TRENDS:

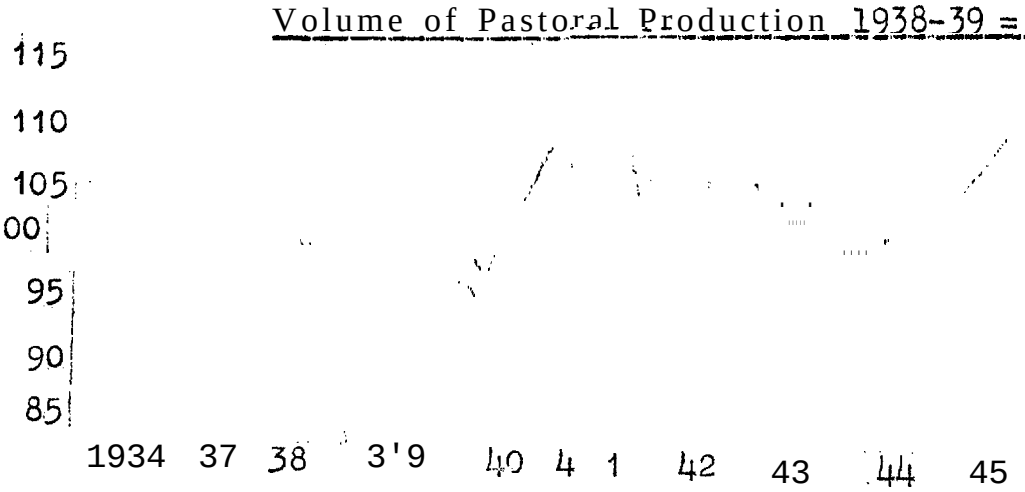
(a) All farm produce.. The volume, of all farm production has, since 1935-36, been at a higher level than it was in 1938-1939. It reached a maximum level of 14% above this level in the season 1940-41. Throughout the period, however, there have. been considerable variations without any suggestion of a distinct trend. The important feature to note, however, is that during and after the war period total farm production was continually above pre-war production.

Volume _of _All _ Farm _Produce.. _1938-39 = 100.



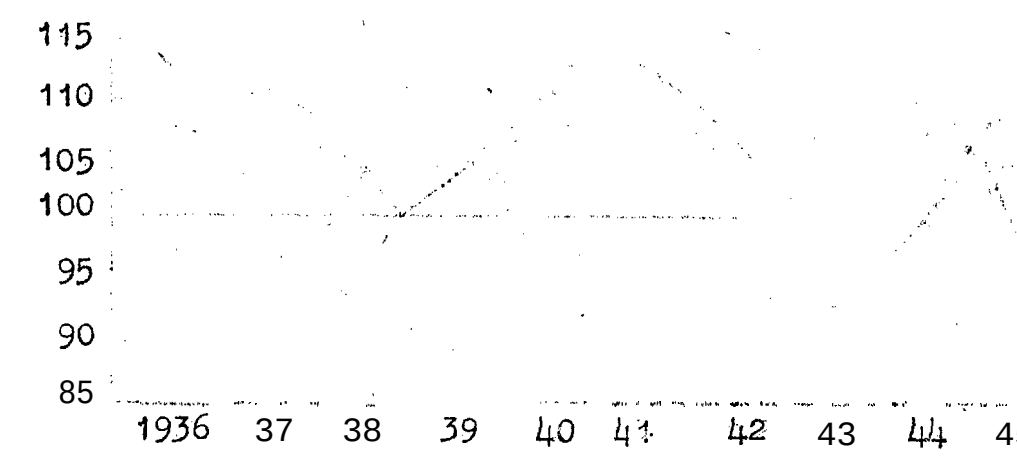
(b) Pastoral produce: The volume of pastoral production has shown a striking upward trend since the beginning of the period under discussion, At that time production was 89% of that at the basic period 1938/39. In 1945-46 production had reached the maximum of 114% of the basic year. During the period, however, there was considerable fluctuation. Nevertheless pastoral production during the war maintained a distinctly higher level than it did prior to the war.

Volume of Pastoral Production 1938-39 = 100.



(c) Dairy Production: A very fluctuating but downward trend is the feature of dairy production. Within this trend a particularly' high level is reached in the season 1940-41 after which the downward trend has been pronounced until in 1945-46 the volume of production was 10% below that in the basic year which year itself was low.

Volume of Dairy Production 1938-39 = 100.



Major trends in 'pasture and animal production are invariably slow, they cannot be otherwise but variations within those trends are common. Too often are these varigtions regarded as being trends due to controllable factors. The greatest variations within. our trends of animal production are due to uncontrollable and unpredictable factors. The most striking and effective factor is that of climatic conditions on our dairy pastures, that is climatic conditions 'play the most important part in varying our short term pastoral production progress, man influences only the long term trends. 'The period under discussion has been no exception. Good pasture growth and peak dairy production were associated in 1936-37, 1940-41 and. 1944-45. On the other hand lower production from pastures and dairy cows were associated during the dry conditions of 1938-39, 1943-44 and 1945-46.

3. GRASSLAND CHANGES:

One naturally asks what changes have taken place i n our grasslands, what changes have taken place in their treatment and what endeavours have been made to alter or Extend existing grassl an d practices.

At the: beginning of the period under discussion some 610,000 acres were sown down to pasture.. This area has decreased almost without variation until in 1945-46 less than 480,000 acres were sown. Without taking into account the previous trend one might be tempted to suppose that war conditions were solely responsible for this continued drop, The decline has, however, been very marked during the period 1937-38 to 1945-1946. A number of factors have, contributed to this. Some of these will be dealt with in detail later. The following appear to be the most important:

1. Lengthening of the rotation on arable country,
2. Increased use of 'lime.

3. High price of seed.
4. Improved, pastures.
5. Shortage of labour.
6. Reduced area of marginal country being brought in.

4. LAND DEVELOPMENT:

For many years land development has been conducted consistently by both the State. and by the private individual- In recent years the more extensive< land development has been carried out by the State and large private concerns. This development has been' conducted over a wide range of soils and climatic conditions -ranging from the gumlands and pumice of the North Island to the rolling brown-top country and the red tussock plains of the South Island.

Such large. scale development necessitated the use of large quantities of heavy machinery, seed, fertilizer, fencing material, building material and labour.

I On the outbreak of war, however, the State's policy regarding land development was changed very greatly and the following resolution passed by the Board of Native Affairs on 22nd September, 1939, discloses the policy not only of that Board but also of other Government Departments concerned with land development: "Resolved that the policy regarding development should be to bring the lands already under development up to a full productive state and to undertake new development only in areas of good quality land in order to increase production in the shortest possible, time with the minimum cost and that work proceed to the: maximum capacity of the available labour."

This policy was put into effect not only by State Departments but also by individual farmers. The bringing in of large areas of undeveloped or poor country was not encouraged. It was considered that as a short term policy, added production w'ould not be secured as rapidly by this means as it would by the maintenance and improvement of country that was already in a reasonably high state of production.

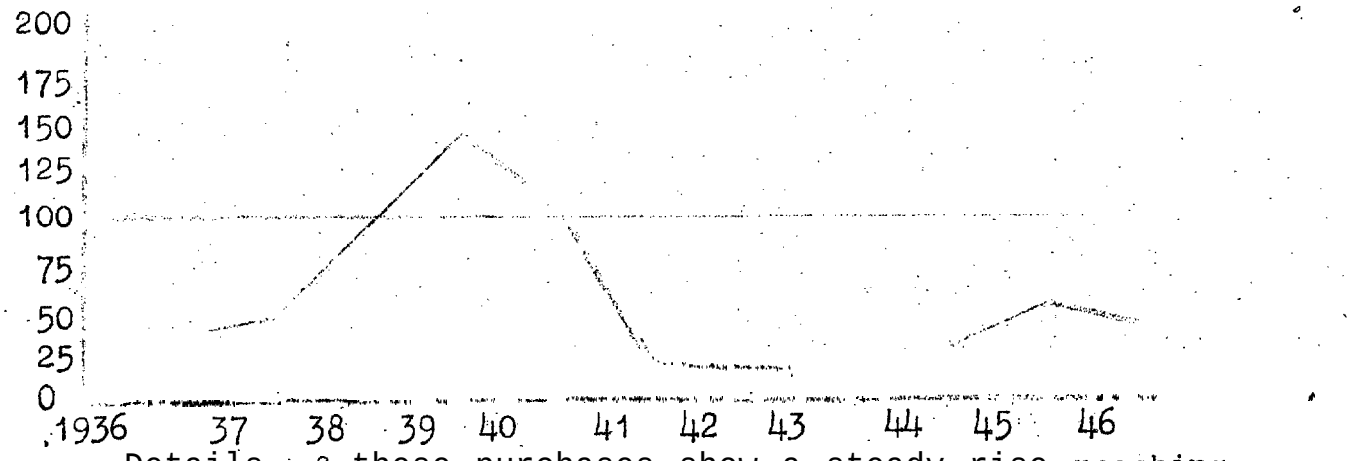
While this policy was advocated and acted upon in a deliberate manner various other circumstances ensured that it was put into effect. Fertilizer rationing, shortage of labour and the method of allocating tractors all had a marked effect in reducing the amount of land development carried out.

With regard to the method of allocating tractors at this. time, all of these, were allocated primarily where an immediate benefit could be anticipated from their use rather than for the bringing in of fresh country. This applied particularly to track laying tractors which were in extremely short supply. During this period the Primary Production Committees comprised of farmers performed a valuable service in this connection.

In general both the State and private individuals concentrated on making the best possible use of land already developed.

It is very difficult to measure. the extent or trend of land development 'during ths period but en endeavour has been made to do so by tracing the amount of ryegrass seed purchased each year for the use of State Departments. While values of all seed purchased might be used for this purpose, the result would be misleading on account. of the variations in values and also because not all seed purchased was used for pasture production. On the other hand it can safely be assumed that most of the ryegrass seed purchased was used for the purpose 'of sowing down pasture and that the greater part of this would be used for land development.

Ryegrass Seed Purchased for Government Departments
1938-39 = 100.



Details of these purchases show a steady rise reaching a peak in 1939-40 after which time it dropped yearly until 1943-44 when less than 20% of prewar purchases were made.

During the last year or two land development for rehabilitation purposes has increased appreciably but this has been concerned more with the improvement of existing properties than with the bringing in of virgin or abandoned country. At the -@resent time land development on a large scale although desirable is limited less by manpower;' machinery, fertilizers, lime and seed, than. it is by fencing wire and building materials both of which are essential to efficient land development.

5. FERTILIZERS:

It is now generally agreed that the main factor-underlying our increases in grassland production,, and consequently livestock production, has been the ever increasing use of phosphatic fertilizers. Other factors such as liming,, improved management, drainage , improved. livestock, and a better appreciation of good strains and species of pasture plants have all-played a large part but a lesser individual part than that played -by phosphatic fertilizers.

It is not intended to labour the question of the effect of fertilizers on grassland except to point out that the main effect is the increase in the nitrogen content of grass as the result of increased clover growth which in turn results from the application of phosphates.

During the period under 'review fertilizer supplies, as all know,' varied very greatly, so much so that rationing became: essential.

The major aspects of fertiliser rationing are too well known to require elaboration. Topdressing allocations were based on. previous usage, that is the. heaviest users of fertilizers' received the greatest allocations..' Many objected to this basis of rationing but no alternative workable schemes of rationing were brought forward. The rationing procedure has allowed for appeals ón the ground of hardship and during the last four years over 65,000 tons have been allocated as the resultof civilian appeals. The average amount granted for each appeal is estimated as being between three and five tons. In addition to. this, considerable quantities have been allocated as the result of appeals from returned servicemen. Both the Lands and Survey Department and the Stat-e Advances Corporation also have. special allocations for rehabilitation purposes.

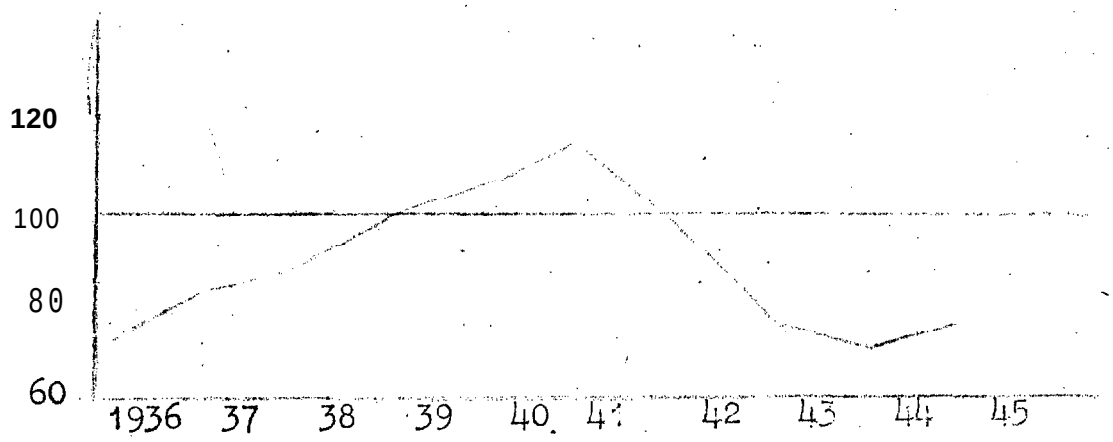
Consequently, fertiliser rationing although harder at first on some individuals than on others has become more. equitable. For the forthcoming season with. a ration representing 67.2% of that used during the two year basic period, more-fertilizer will be available for topdressing than was the case before rationing commenced. This position is possible on account of the large quantities of fertiliser allocated on appeals and- for-rshabilitation purposes.

The basis of fertilizer allocations for topdressing is given as a matter of interest. Rationing was based on the average amount of fertilizer used for topdressing in the seasons 1939/40 and 1940/41, that is during the two years prior to rationing being introduced. The following are the various amounts allowed each year with reference to the basic period just referred to:

Season:		%	
1939-40) 1940-41)	average ..	100	
1941-42	..	40	
1942-43	..	28	
1943-44	..	28	
1944-45	..	28	+ 1 cwt. per milking cow depastured during the 1944-45 season.
1945-46	..	42	
1946-47	..	50.4	
1947-48	..	67.2	

As one would expect the area of country topdressed each year with fertiliser was a reflection of the degree of rationing as there was a general and large unsatisfied demand for fertiliser.

Area Topdressed with Fertilizers and Fertilizers + Lime. 1938/39 = 100.



In 1935-36 topdressing was some 28% below that of 1938/39. It increased rapidly until it was 15% above in 1940/41. Rationing then reduced ths area topdressed to a low level of 69% of that in 1938/39.

It is interesting to note that although at that time rationing was based on 28% of previous usage the actual area topdressed was not correspondingly reduced. From this it is reasonable to suppose that the overall rate of application per acre was reduced. Since then as the fertiliser ration has increased so has the area topdressed with fertiliser also increased.

A question that has been discussed very freely since fertilizer rationing first commenced has centred round the actual effect of rationing on pasture production. The total livestock production is known, the total area topdressed is known, but the effect of the absence or reduction of topdressing is not known. For example the season 1943/44 was a season of "lows." Fertilizer availability was at its lowest, topdressing was at its lowest, butterfat production was at its lowest, wool and meat production dropped. One might, therefore, be tempted to suggest that fertilizer rationing was closely connected with these "lows". Ths most important factor responsible for this low production was not the absence of fertilizer but the absence of good weather. A severe winter was associated with a considerable reduction in the number of dairy cows. Added to this there was a good high producing October which was followed by a dry low producing summer.

There does not appear to be any relationship between ths

supply of fertilizer and farm production in the period 1935-36 to 1945-46. Farm production as a whole has increased in spite of shortage. of fertilizers. -An examination of production figures from a series of trials at Marton on fairly high fertility intensively farmed land indicates that the complete absence of topdressing has resulted in a decline in production accompanied by a deterioration in the nature of the sward. This decline did not become marked until 4 to 5 years after topdressing ceased. If this experience were general it would be safe to assume that the overall effect on production throughout New Zealand would not become of consequence until some 4 to 5 years after topdressing had ceased, Actually the system of rationing adopted ensured that the shortage of raw materials resulted in overall reduced topdressing rather than a complete. cessation of topdressing on some properties. For these reasons it is not surprising that there is no obvious reflection in production. figures of the shortage of fertilizers experienced during the war years, particularly as lime took up the running.

The foregoing comments refer, however, to production from pastures as a whole, They do not take into account the effects of the absence or reduction in topdressing on the various types of country. There are no statistics to deal with this aspect. But it is an extremely important aspect.

We have in New Zealand two ma-in types of country. Firstly, 'there is the country that is growing clover well and easily, and secondly, there is the country where clover is either just struggling to exist or not existing at all.

The- whole of our farming endeavour aims at the Conversion of the second type of country into the first, irrespective of whether it is the dry. plains of the South Island or the high rainfall hills of the North Island. The manner in which this is being achieved varies; it may, be through the use of irrigation, or drainage, lime or phosphate, sheep or cattle,.

There is little question that the shortage of fertilizers has been and still is felt, not on the good rich alluvial plains, nor on the poor danthonia or fussock country but on the country in between. It has been felt most severely by those farmers-who had initiated a programma of pasture improvement but who had not completed it when rationing started. It was not felt so much by those wh-o had completed their programme or by those who had not commenced such a programme.

There are a number of examples of pasture 'deterioration due to shortage of fertilizer. These are most striking where topdressing had commenced and the stock carrying capacity maintained.' In such cases deterioration has been so severe that the pastures are now going to be difficult to revive, During the period of fertilizer shortage there. was much discussion on the manner in which the. 'available fertilizers could best be used. In general it was considered most advisable to topdress these good pastures that would deteriorate rapidly without the aid of phosphate rather than those good pastures that could maintain themselves without topdressing.

To what extent the future of our hill country depends on fertilizer is hard to say. There is little. doubt that with fertilizer much can be improved very greatly provided always that the clovers are there to use it and that the right kind of livestock is there to use the pasture;

6. LIME:

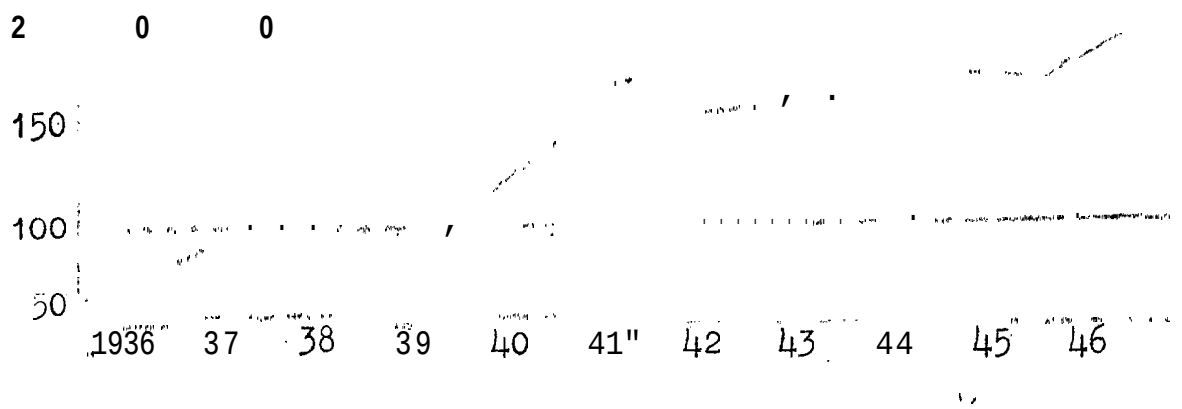
'In certain areas' of New Zealand the value of lime has long been realised. In other areas its value is only now being rsalised. In still others it is of no value at all. Over a long period the production of agricultural lime has increased at a steady rate.. while the total production -of lime in New Zealand is not known it-.is considered. that sufficient of it is shifted-by

rail to justify that quantity being used as a reliable guide regarding trends in overall lime production.

The total quantity shifted by rail has -shown an almost unbroken increase from 1935/36 when 244,738 tons were shifted to 1945/46 when 725,386 tons were shifted.

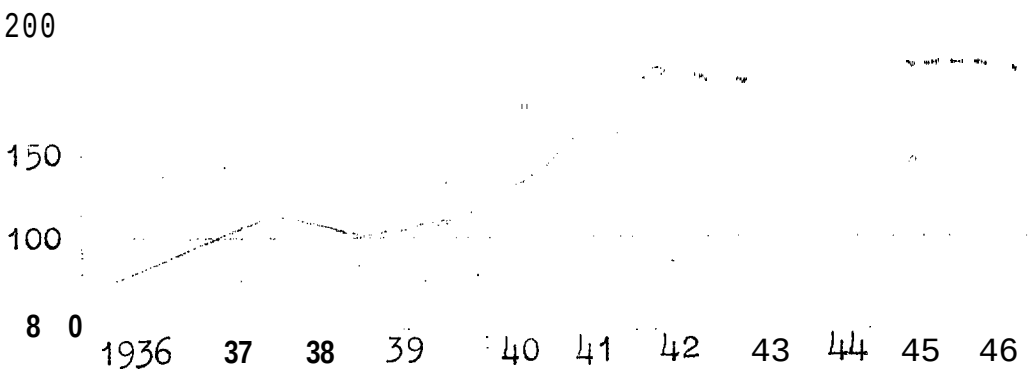
This of course means that-during the last eleven years the use of lime has virtually trebled. It should be noted that no account has been taken of lime carried by road which at certain times has been considerable and which in some districts is the only method of transport.

Lime by Rail all New Zealand 1938-39 = 100.



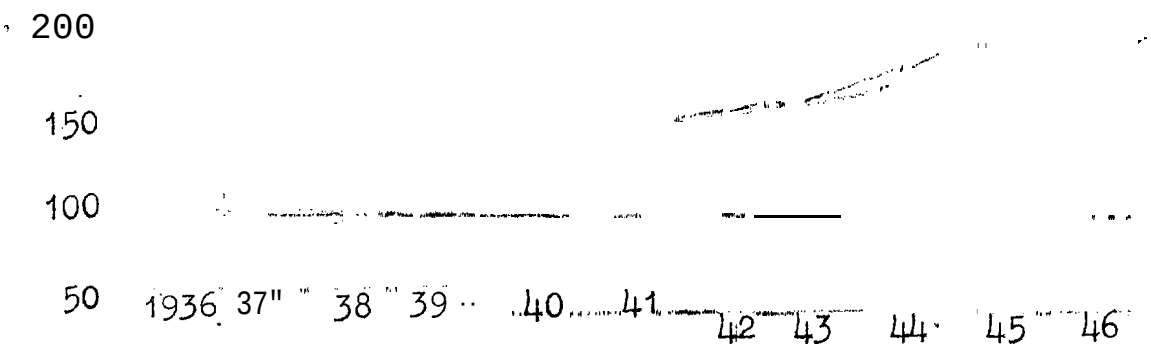
On the same basis it is evident that the South Island has been a consistently higher user of lim-than the North Island. From the seasons 1935/36 to 1946/47 inclusive some 2,630,509 tons of lime have been shifted by rail in the North Island as against 3,505,448 tons in the South Island. In the North Island the usE of lime increased by 83% between 1938/39 and 1941/42 after which time usage had increased by another 15% to its maximum in 1944/45.

Lime by Rail North Island 1938-39 = 100.



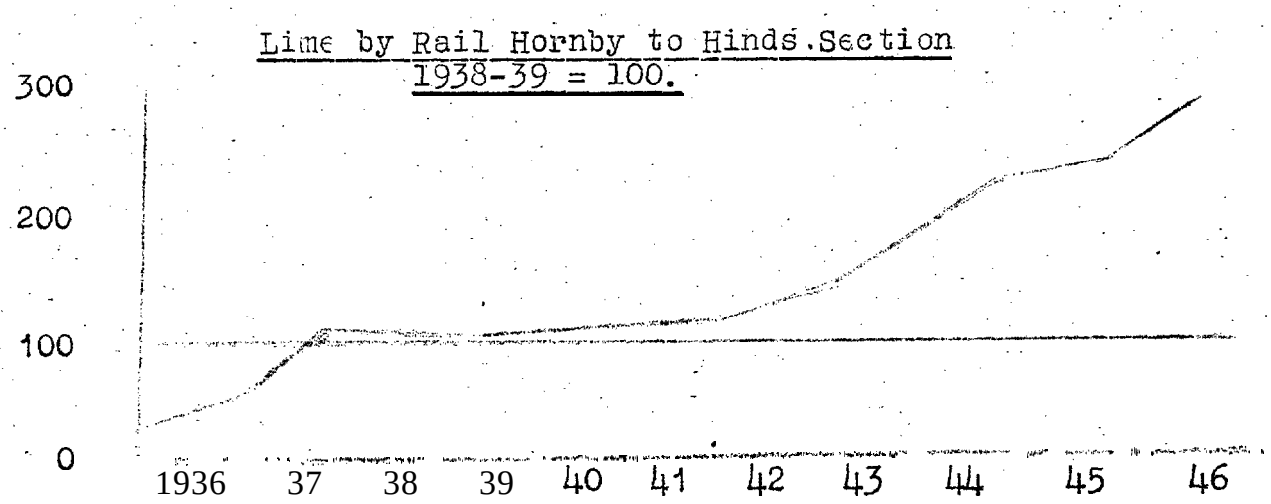
In the South Island usage has increased steadily. Between 1935/36 and 1938/39 usage has almost doubled since when it has almost doubled again to the present time with a total of 432,311 tons.

Lime by Rail South Island 1938-39 = 100.



The coastal areas of Otago and Southland have been regular users of lime for many years and usage there has increased considerably during the, past few years. There has; however, been a phenomenal increase. in the use of lime in Canterbury. This is well exemplified in deliveries to stations on main and subsidary line-s from Hornby to Hinds.

This takes in the Southbridge, Little River, Arthur's Pass, Coalgate, Methven and Mount Somers lines.

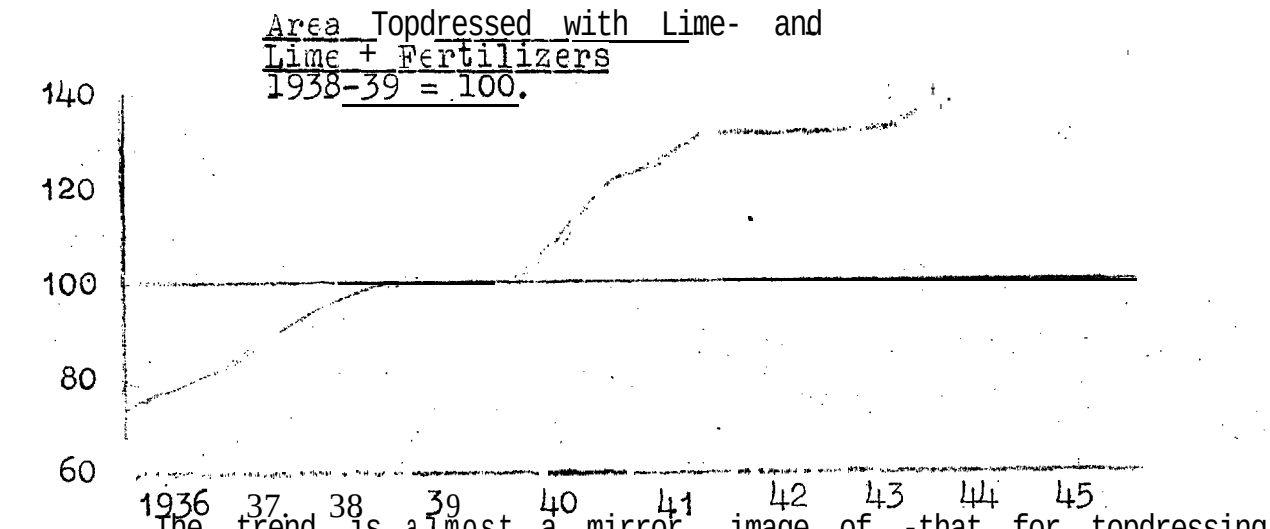


In 1935/36 lime carried amounted to 10,181 tons. This increased almost without a break until 1946/47 when 86,342 tons were carried.

As is the case with phosphate the. value of lime can be judged to a large extent. by the measure of response of clovers following, its application. For many-ye-ars the drier parts of the Canterbury plains did not grow good white clover, Their original strains were low in production, the certified strains did not last in the poorer country, and red clover was short lived although liming was known to benefit it very greatly, It was not until Subterranean clover, commenced to get a hold in these parts that a virtually permanent useful clover was available.; Lime, together with phosphate, hes played no small part in establishing these Subterranean clove.-r. areas on much of the plains country and it has assisted in widening the range of country on which go'od strains of white clover will thrive.

The value of lime to grassland cannot be measured only by the area of grassland topdressed as most of the lima applied to'cropping areas is of ultimate advantage% to pasture.

A glance at the lime topdressing trend suggests that the major factor responsible for the increased use of lime was the shortage. of phosphate for topdressing.



The trend is almost a mirror, image of -that for topdressing with phosphate. That is, topdressing with lime which practice was increasing steadily, increased more. rapidly' as the severity of fertilizer. rationing increased. There is the difference that it has continued to increase even though the quantity of-phosphate: has increased.

During the. war period farmers have become more and more lime conscious, new lime works have been opened, bulk delivery has 'become an accepted practice in some. districts and the demand for lime. remains unsatisfied.

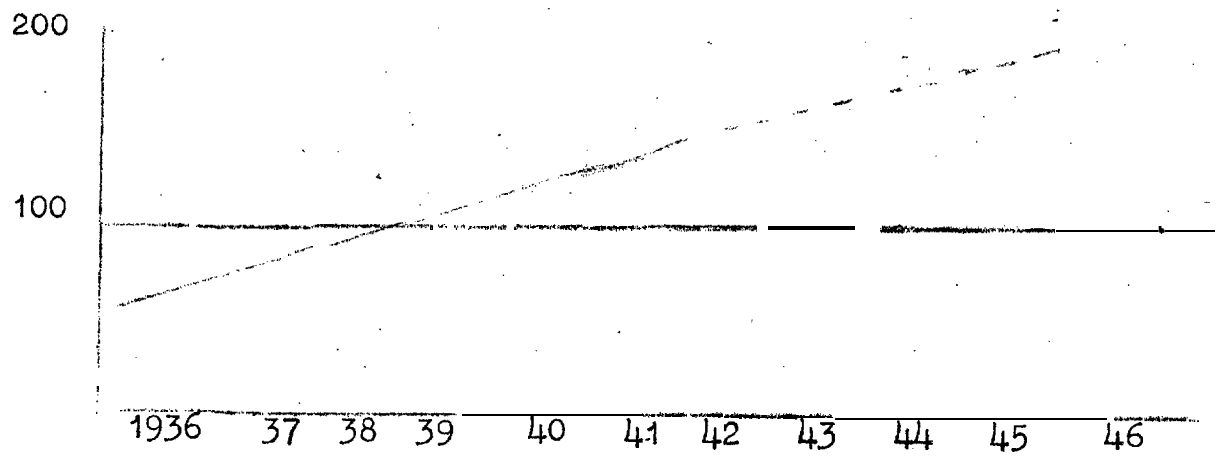
Much'country yetremains to be limed, particularly steep areas. and areas that are remote from works or rail.

7. MECHANISATION:

As time goes on more and more reliance. is being placed on the use and convenience of farm mechanisation. Mechanisation is not solely a question of high powered tractors capable, of dragging-gangs of heavy implements. Mechanisation is the replacement of hand done work by machine done work. Mechanisation has progressed steadily for centuries. There have been many stages in mechanisation of farm work ranging from the sickle to the header harvester, from the wooden plough to the multi furrow plough, from hand power to- horse power and from horse power to tractor power. In some countries the hand still pulls the plough. In New Zealand it is only comparatively recently that complete mechanisation has been achieved by the tractor replacing the horse. The only aspect of mechanisation for which figures are available is that of tractor numbers.

Any trend in relation to tractor numbers indicate a tendency to the completion of mechanisation rather than the beginning of nechanisation. Beering this, in mind it is of interest to note the very steady and rapid increase in the number of tractors for agricultural purposes. Twenty-two years' ago the number of agricultural tractors barely topped the thousand mark. By 1946 they had almost reached nineteen thousand. The rats of increase has been very great. During the period 1938-39 to 1945-46 tractors increased by almost 11,000.

Agricultural Tractors - 1938-39 = 100.



In other words the number of agricultural tractors in New Zealand virtually doubled during the war at an average rate of some 1,550 machines per annum. Even at this rate the supply available was totally inadequate to meet the. exceptional demand.

Less spectacular but equally striking is the. increase in power of tractors.. Just prior to the war the average horse-power of the farm tractor, was 17 - now it is over 21. While it must be realised that a large. proportion of the tractors went to the agricultural districts, particularly Canterbury and North Otago, the fact must not be overlooked that during the war period a very large number of low powered tractors went to the North Island dairy farmers, particularly in the, South Auckland, district. There the tractors were purchased not so much for cultivation purposes as for labour saving and general haulage purposes such as taking the milk to the factory, harrowing, hauling-the topdresser, mowing, raking and tedding the hay. Often even on the highly specialised and intensively farmed dairy farm a small tractor was considered to be absolutely essential. During the war period the farmer was well supplied with *tractors.* Numerically they were more plentiful than before. There was, however, a

very -serious shortage of tractor-laying machines. This meant that the low country farmer was at least fairly well served but the farmer on the hills received only a small portion of his requirements. Towards the end of the period a number of the smaller tractor-laying machines were received and were rapidly absorbsd. There is still a large. unsatisfied demand for tractors..

What has been-the effect on our grasslands of this very great increase in tractors during the last few years. It cannot be said that it has enabled more land to b'e brought in. The evidence shows that country is going out of production rather than being brought; into production. Nor can it 'be 'said that more grassland has been sown down. The evidence shows that less is being sown down,,

The main effect that the. increase in tractors has had is- in the replacement of the: horse which had dropped numerically by over 20% since 1939.

The question of the influence of the tractor in -agriculture was recently investigated -and discussed in the "Journal of Agriculture" for June.,' 1947. The following sentences are the essence of the summary: "The adoption of the tractor by practically all classes. of- New Zealand farmers does not appear to be reflected in any important change in farm management practice or production. Tractors are being used to perform the work previously done by horses."

While the tractor may not have affected production it' has doubtless eased the life of the farmer, it has reduced to some extent the need for labour and the need for cropping that is in -many parts associated with the maintenance of horse teams. Labour for handling horse teams is becoming more and more difficult to secure. This is a result rather than a cause of the change from horse to tractor..

There are many aspects of mechanisation in addition to that of tractors. In recent years the agricultural contractor has taken an increasingly important part in farming, Many small farmers do a considerable amount of nearby work for neighbours particularly with light machinery. The heavy machinery used for contract work is usually owned by the, man whose whole livelihood is: contracting. Here again the contractor with heavy machinery has replaced and added, to the number of contractors who used horses.

From the grassland view point the most important contractors are those dealing with the contract application of lime and fertilizer. This service which was making progress before the war has developed considerably since then. In some districts it has not only reduced the farmer's work but also his worry and costs., Another important contract feature is that of hay baling. During the war period hay baling received a considerable stimulus through the introduction of the pick-up self-'tying hay baler operated largely by contractors. Just as the header-harvester had its opponents so have the pick-up balers,. When only a few machines are available crops are liable to be dealt with irrespective of whether they are or are not fit to handle..' As the number of machines increases then the work becomes more efficient owing to the decreasing need to do the work "now or never."

A further aspect of farm mechanisation that is becoming increasingly 'appreciated is the use of the tractor and blade for track cutting on hill country farms. The cutting of these tracks has enabled large areas to be topdressed by hand that would otherwise have been neglected. Here the. tractor has been able to replace the laborious work involved in packing-fertilizer up the hills. It has allowed the wheel, man's greatest invention, to replace the animal.

When discussing the question of mechanisation one must not lose sight of the possibility of using the aeroplane as a piece of farm machinery. In some countries it has been used fairly extensively for the purpose of applying small quantities of material

over relatively large areas, As long as the need is there, there 'is no reason why this cannot be done. in this country also, provided always that the cost is within the reach of the farmer and that it is at least as efficient 'as existing alternative methods of application.

On two recent occasions it has' been possible. for work of this nature: to be carried out in New Zealand. In one case five pounds of Copper Sulphate per acre was applied over a large area of country in the Hauraki plains area. Ordinarily such a dressing would be incorporated with 'annual topdressings of fertilizer. In this particular locality this was impossible on account of the large area of country involved that had too rough a surface to allow a wheeled machine to be driven over it.

The other instance was when Cobalt Sulphate was successfully' applied-at 20 ozs. per-acre to a large area of inaccessible hill country in the. Taumarunui district.

These: are excellent examples of spreading small quantities of material over large areas of country. If it could be shown that the mere application of small quantities of seed alone over large areas of hill country would result in a permanent pasture improvement then the aeroplane could well be used for this purpose also. Frotn a mechanical point of view there doss not appear to be any great difficulty. The difficulty lies not in the method of application as much as it does in the result of the application. Experience has shown that the broad--casting of seed alone on unprepared surfaces results in many failures. A problem that still remains to be solved is how to raise the percentage of, successful surface sowings on existing pasture. Following burns where there is a reasonable. amount of ash surface sowing is successful as a rule. It is frequently not so successful in an existing sward, whether the grass is tall or'short or whether the pasture is dense or open. As a rule clovers will establish 'much more readily than will grasses but even clovers fail frequently.

The problem in reviving hill country pastures through the surface sowing of legumes is.not one of getting the seed on to the ground but one of getting the. seed into the ground.

In recent years there has been much discussion on the question of aerial topdressing of fertilizers. The matter has caught the public fancy. It is,' however, a very different problem from those already referred to. It involves ths application of large quantities of material over relatively small areas of land, The whole question has been investigated very carefully by various interested parties. It is generally considered that aerial topdressing of fertilizers can be. carried out successfully only under the following conditions:-

1. The country must be highly responsive to the particular fertilizer which it is proposed to apply.

2. The pastures to which the fertilizer is to be applied must be of a sufficiently high standard-to warrant topdressing.

3. The fertilizer will require to be as concentrated as possible and comparatively easily available, to the plants. This is necessary to ensure that as large a quantity of fertilizer material can be spread over as large an area as possible each trip,

4. A suitable aeroplane must be available,,

5. The method must be at least as satisfactory from both financial and practical considerations as are existing methods.

The first two factors are under investigation and do not present any particular difficulties. The third, namely concentrated fertiliser, is also under investigation. It appears, however, that such a fertilizer could not be readily manufactured in this country. The overseas price is very high and New Zealand experience is too limited to form an opinion regarding its value. The fourth condition/that is the availability of a suitable machine is the greatest stumbling block. No aeroplane suitable' for this work is available in New Zealand. As far as is known no such machine. is available in either Great Britain or the U.S.A.' Nor is it known that such a machine has even been designed. It is understood,- however, that manufacturers would be prepared to design and build such a machine-if they had the assurance of sufficient orders to make, it worth their while. And that, together with the cost, is the crux of aerial topdressing of fertilizers.

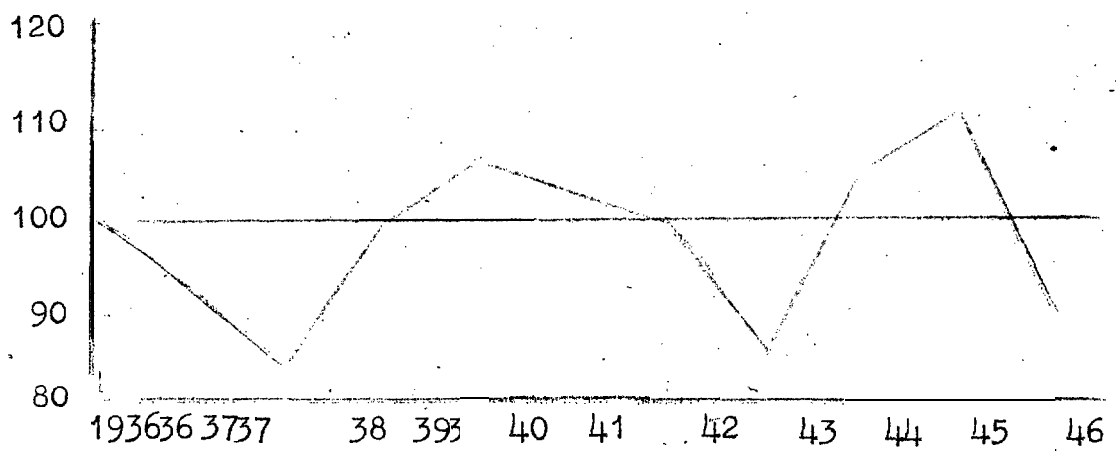
In the meantime, therefore, it is obviously a waste of time and effort and money carrying out such topdressing trials with unsuitable material and an unsuitable machine in an endeavour to ascertain what the results would be if a suitable fertilizer and , suitable machine were available.

Summed up mechanisation can be regarded as a very important step in pasture prdgrsss. As mechanisation increases so does our area of better pasture increase., not only on the plains but also on the hills. And a's our "milk" pastures improve. so do they carry an ever increasing quantity of fat stock. The future of New Zealand pastoral farming is closely linked with our ability to mechanise still further, one of our most important mechanical aids being the humble. topdresser, whether, it is pulled by horse: or by-tractor.

8. HAY AND SILAGE:

The provision of winter feed in the form of hay and silage is common but by no means invariable feature of pasture production. The chief factor determining the quantity and quality of hay saved is not so much a predetermined scheme as the weather. Prior to 1930 the hay and silags saved each year increased very rapidly indeed: Since that time the position has, on the whole, been stationary, there being no distinct trend in either direction. There have., however, been very considerable variations in acreage.

Area cut for Hay 1938-39 = 100.



During the period under discussion, i.e. 1935/36-1945/46 'the area saved for hay has varied from a low point of 379,296 acres in 1937-38 to a high point of' 498,111 acres in 1944/45. The area cut depends chiefly on one thing, that is the amount of feed surplus to immediate requirements during the. whole time. that a pasture is shut up for hay. As soon as the feed position becomes acute, hay paddocks are grazed in increasing numbers. The critical period in determining the area of hay saved is the period in which the hay is growing and not the period in which it is cut.' The evidence shows that if the hay is there to be saved it is saved even in a wet season. The question of quality of course depends very

largely on the rapidity with which it can'bs made. The effect of seasonal conditions 'on hay making can best be shown by examining the position in some exceptional seasons. Details of these are as follows:-

Large Acreages.

Season:	Acres:	Weather:
1939-40	481,461	A mixed season with dominantly high pasture production in summer.
1940-41	462,859	High production sustained from early spring.
1943-44	474,992	Poor spring with rapid growth in November and December, turning. to drought at the end of December. Pasture production was not high overall but there was enough surplus. at the critical time to enable a good quantity of hay to be made.
1944-45	498,992	Pasture production well spread with good rains in summer and autumn.

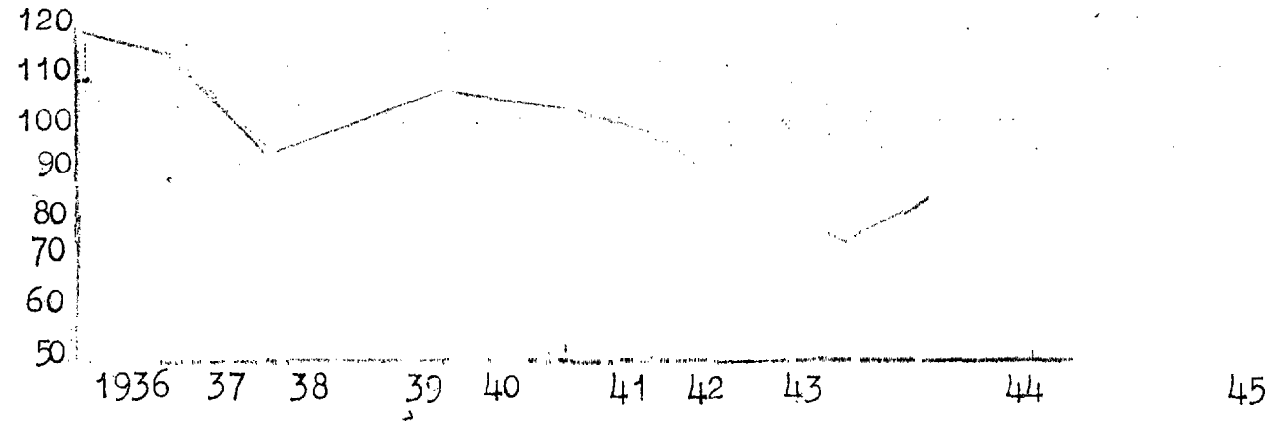
Smaller Areas:

1937-38	379,296	Pastureproduction not good on account of three drought periods, the most severe being in December.
1942-43	389,534	A very narrow and early peak of production with drought conditions in December.
1945-46	403,479	A fair spring followed by a prolonged summer drought,

The foregoing in no way pretends to present a complete picture or analysis of the factors that are involved in deciding in the area of hay saved. It does, however, emphasise the tremendous part played by the weather in this matter. It shows that availability of labour, mechanisation and fertilizers have little immediate effect on total acreages. It is, however, almost, certain that mechanisation in recent years has facilitated the savings of much hay that might otherwise have been lost. The most important aspect of mechanisation is the steadily increasing number of labour saving and rapid working balers,

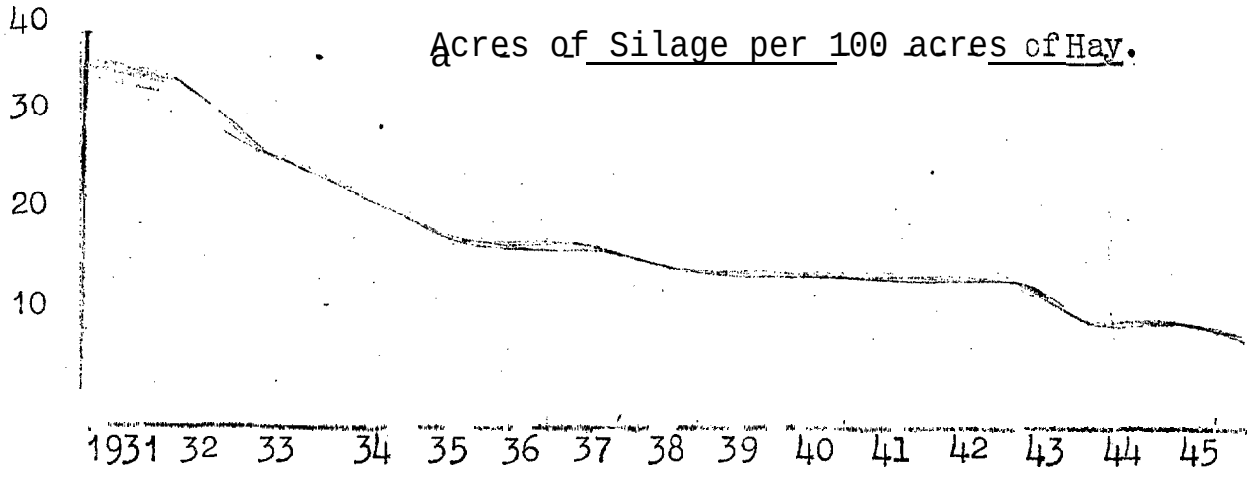
Ths position with regard to silage making is very different from that of hay.

Area Cut for Silage 1938-39 = 100.



There is a very marked and' comparatively steady trend away 'from silage rnaking and this has been so since the early 1930s. This fall away does not seem to have been accentuated or reduced during the war period. It is also interesting to note that ths falling off in silage making relative to haymaking is also fairly steady. In 1930-31 about 40 acres of silage were cut for every

100 acres of hay. This has dropped steadily until at the present time less than 10 acres of silage are: cut for every 100 acres of hay,,

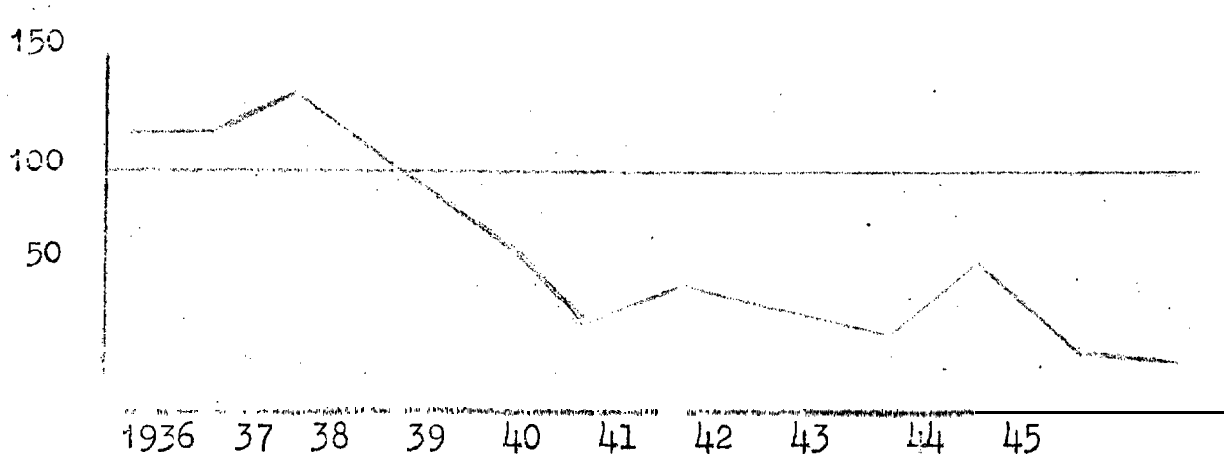


The, falling off in the area saved for silage has been due largely to the fact that it is so labour'absorbing not so much during making as during feeding out. While the bulk of the hay and silage were fed out direct from stacks the use. of silage was not such a great disadvantage. With the increase: in hay baling the relative differences in the case of working the two methods became very much greater, During the war years there was little or no alteration in this trend away from silage and it is anticipated that so long as hay can be dealt with more sasily so will the trend away from silage continue except in those, districts where good hay cannot be made.

9. FENCING WIRE:

Fencing is such an important aspect of pastoral farming, that some comment on it is warranted in this review. Fencing materials are required for two main purposes, namely repairs or alterations to existing fence lines and for the erection of new fences. As the fertility of the country as a whole is raised and as the country can be economically subdivided so does the need for more and more fences increase. Land development can be carried out successfully only if the country can be fenced properly, Without fencing there can be no control over the livestock and without control over the livestock pasture deterioration is inevitable, The shortage of fencing wire in New Zealand has been and still, is a major factor limiting extensive land development. There is adequate seed and fertilizer but without fencing these are of little value.. For some time prior to the war New Zealand was importing an ever increasing amount of fencing wire reaching almost 16,000 tons in 1937. Since then the amount imported has dropped fairly steadily until in 1946 only 2,318 tons came into the country-

Imports of Fencing Wire 1938-39 = 100.

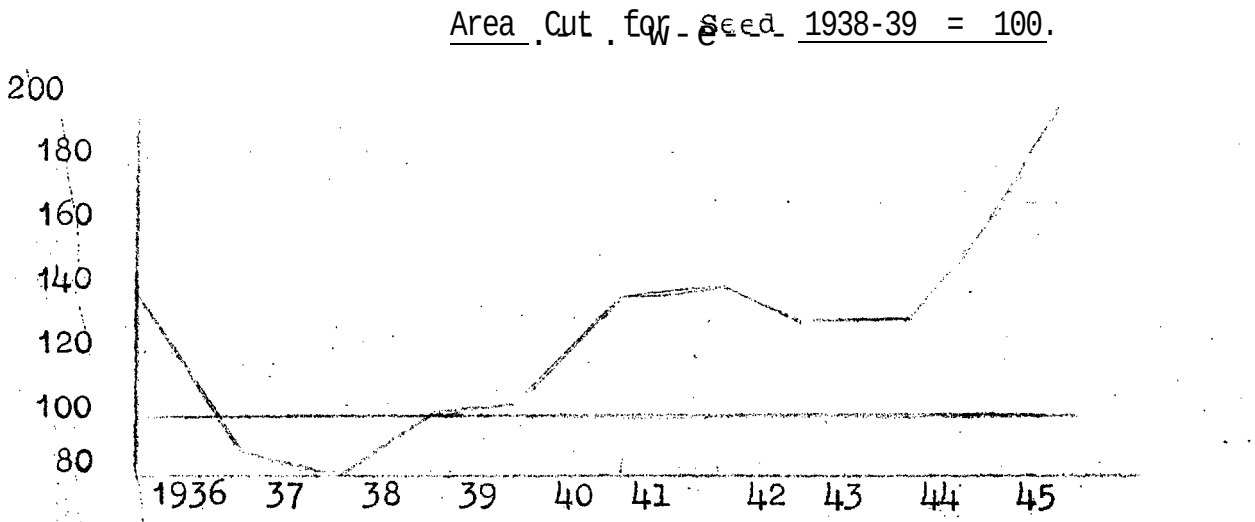


Our present import' of fencing wire is now less than 20% of that, in 1939 when the decline had already started, In many parts fencing is beginning to show the need of attention and there does not appear to be any prospect of improvement for some years,

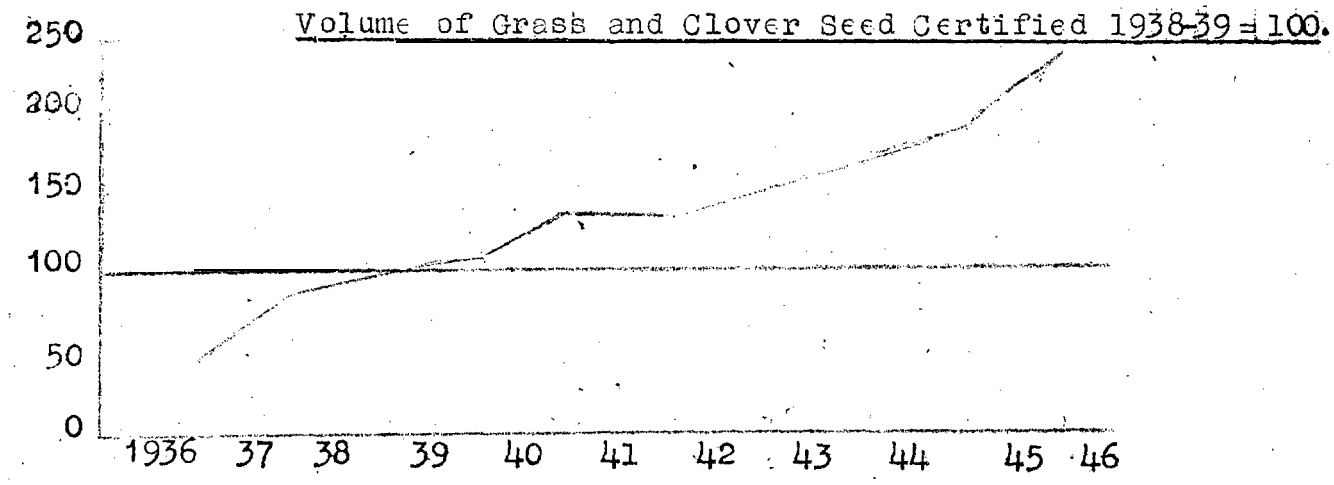
It is considered that the shortage of fencing material, if it continues, may well have more serious effects on the progress of the pastoral industry as a whole than did the shortage of fertilizers. To what extent the wire available can be used to greater advantage is hard to sag. There is little doubt that the electric fence can play an important part as far as cattle, even run cattle, are concerned, but its value for sheep is negligible;

10. SMALL SEED PRODUCTION:

For a number of years small seed production has been an important adjunct to the production of fat lambs on'high quality pastures, There have been considerable variations in the area saved for seed but on the whole for a number of years prior to 1938-39 the position was more or less steady. During and after the war years the production of small seeds *has* increased very considerably although not necessarily steadily until in the 1945-46 season the total area harvested was about double that of the 1938/39 sea-son.

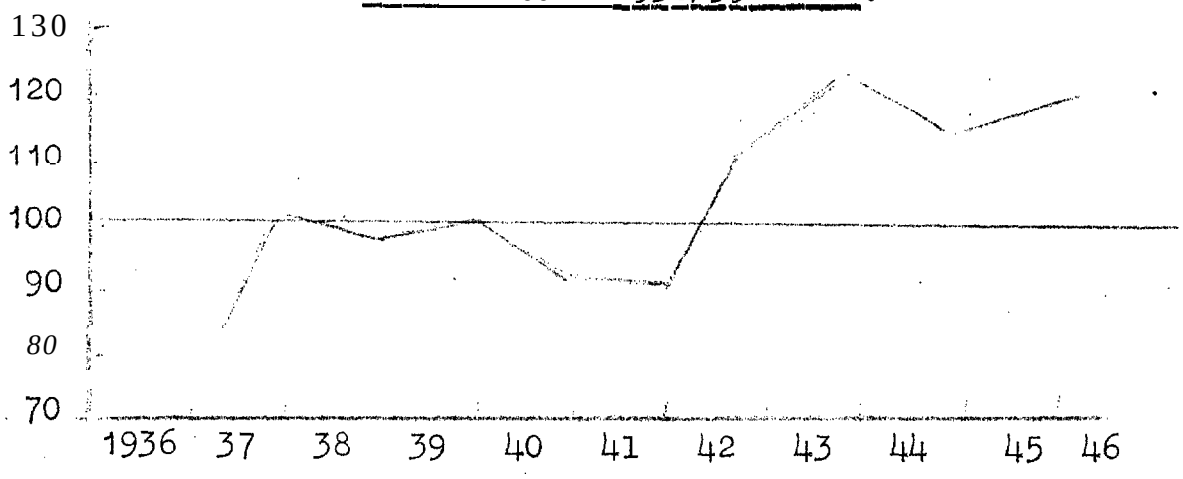


A number of reasons have contributed to this increase in small seed production. There is little doubt that high prices influenced to a large extent by overseas demand have been a major factor. The rapid increase in the number of header harvesters has also played an important part. This applies particularly to the smaller machines. The se have been purchased in many instances for use on grain crops,, but partly to help pay for them and partly to increase their general use they have been used extensively on small seed crops. Having a header on the property has encouraged many farmers to go into small seed production when they would not previously have paid much attention to it. The increase in seed production has in many cases been accompanied by increases in carrying capacity as the result of the pastures being sown down with better strains of pasture plants. This pasture improvement is without doubt related to the seed certification scheme. By assuming reasonable and constant values for the various species of certified seed and totalling these each year it is possible to arrive at a Fair basis for comparing relative annual production.



Taking the 1938/39 season as 100 units, production rose from 45 units in 1936/37 almost without check to 249 units in 1945/46. That is, during the war period the production of certified pasture seeds increased by two and a half times,

Volume of Certified Seed relative to total area cut for seed = 100. 1938/39 = 100.



If one can assume (and this may be open to some doubt) that the total area saved for seed is related directly to production then it appears that in recent years at least that the quantity of seed certified has increased at a more rapid rate than has total seed production. This indicates that certified seed is becoming an increasingly great part of the total seed produced. One of the most valuable aspects of this increase in total seed and certified seed production is the accompanying improvement that is taking place. in pasture throughout the country, Twenty-five years ago much of the seed harvested in the South Island was of a poor non-persistent type of little: value to either the North or the South or to overseas buyers. The seed harvested in the North came mainly from old pastures that were often weed infested and low in yield. As certified seed production has come increasingly important so has it been accompanied by an overall improvement in the type of pasture from which it has been harvested. This applies particularly to ryegrass but also to other species such as cocksfoot, red clover and white clover. During the. war years, seed production,' and in particular the production of the better strains of grasses and clovers in the schema of seed certification, has resulted in improved pastures generally. E v e n if the seed trade does dwindle somewhat its effect will be long standing by virtue of the increase in good pastures in the seed producing districts,

11. CONCLUSION:

In a review such'as the foregoing it is impossible! even to touch on many important aspects of our grasslands and the. efforts that have been made to produce more from them. It has not been able to discuss the 36% increase in livestock carried by rail nor the 12% and steady increase in wool production nor the 5% increase in the number of breeding ewes. It does not deal with the results of recent research work on grasslands; it does not deal with the individual species which make our grasslands so important, nor does it deal with the new and even increasingly important strains of bred pasture. plants. it does not deal with the many pasture problems that arise from the plains and the hills. This review has dealt with the factors that have influenced the production from our grasslands rather than with the grasslands themselves. It has shown the continued increase in pastoral production during the war period and it has shown that this has been possible in spite of many difficulties. It has shown that farmers in NEW Zealand realise that "The land has no value other than what they gave. it." It has shown in spite of everything they have steadily continued to give the land a value by increasing its productivity,