VALUE OF PASTURE SPECIES IN TARANAKI

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It would be a serious omission on my part if I did not begin this paper with a shot of Mt. Egmont (8260ft.), which by the even spread of rainfall which it encourages plays such an important part in the success or otherwise of the different pasture species in Taranaki. Rainfall ranges from approximately 100in. at the reserve; to 40 to 50in. on the coastal farms. The area that comes within the scope of this paper' extends approximately 15 to 20 miles on the northern, southern, and western slopes of Mt. Egmont and approximately 20 to 30 miles on the eastern slopes to the more marginal lands east of Stratford. I would emphasise that my paper concerns Taranaki only and dairy pastures.

It is necessary, .I think, to mention briefly the soil types in the province.

Although from a soil study point of view they may vary widely in their make-up, they are all of volcanic -origin and have no serious or even known deficiencies of trace elements. The fertiliser requirements are well known, the major ones being phosphate and potash over the whole of the area, though it has recently been recognised that on the higher slopes of Mt. Egmont the very high rainfall can result in periods of nitrogen deficiency. The only other difficult soil types are probably the peats around Ngaere and the thin coastal belt of pure sand.

On all other parts of the province one can say that good pasture species can be established and maintained by good management and stock control and the intelligent use of fertiliser to offset the known. deficiencies of phosphate and potash.

PASTURE SPECIES

Before discussing the most useful and more widely used species I would like to make passing reference to some of the more obscure grasses and clovers. Some of these may have a place in New Zealand, but not in

Taranaki, where a ryegrass-white 'clover sward can be established and maintained.

Some of these grasses like floating sweet grass, the foxtails, fescues, strawberry clover, and many others have little place in our grassland economy. .On the other hand there are a few including paspalum, Yorkshire fog and browntop which do make a worthwhile contribution to pasture production under certain conditions, For want of a better term, I will call these "secondary" grasses. Yorkshire fog and paspalum in association with subterranean clover can be quite useful in bringing in some of the small areas of peat and sand in Taranaki.

They also have the value of keeping -green the earth that 'man sometimes does abuse, but they have their limitations. In Taranaki we are very fortunate that climatic and soil conditions enable us to grow and maintain the higher fertility demanding species which have good seasonal growth such as red, white, and subterranean clover, cocksfoot, timothy, prairie grass and perennial and H1 or short-rotation ryegrass, and it is these grasses and clovers that I would like to discuss more fully.

CLOVERS

Subterranean, red and white clovers are I think the only three clovers worth growing in Taranaki. Subterranean clover is and has been very useful and is mainly used on slieep pastures or hill country. Its place in the 'dairy. pasture is very limited and where white clover can be established subterranean clover has no place. On some of the steeper country being dairied on, and on the coastal sands, subterranean clover can be useful, in the initial stages of fertility build-up.

RED CLOVER

The place of red clover' is 'a very controversial point at the moment. It is easy to establish but very hard to maintain after the second summer under dairying management,. so that its usefulness probably hinges on the bulk of feed it produces in the first two years:. On the other hand when included in a short-rotation ryegrass award it can and often does dominate the sward to the detriment sometimes of both ryegrass and white clover. When this happens,-bloat is frequently the limiting factor in its control, and it-sometimes has to be cut for hay in the first yeas to the detriment of the

new pasture. A glaring example of this occurred on a farm at Kaponga where three years ago (owing to potash being the limiting factor) clovers were hard to establish, Potash at 3cwt. per acre was sown at seeding, which consisted of 15lb. of short-rotation ryegrass, 3lb. .of white clover, and 31b. of red clover, good germination of 'all three being obtained. Management was designed to give good clover establishment, but actually resulted in red clover taking complete control of the sward. Attempts were made to graze at the 8 to 9in. stage, but this produced so much bloat that the paddock was left and cut for hay with red clover 18in. to 2ft. high: This management was detrimental to the white clover and short-rotation ryegrass components of the pasture. However; this spring it is showing signs of recovery with short-rotation ryegrass still a bit thin, but by letting it grow to the 9 to 10in. stage and only grazing back to about 3in. this pasture will probably develop into a good ryegrass-white clover sward.

WHITE CLOVER

One can really write very little about this plant: It is accepted that without it no sward will continue to be vigorous and just reverts to a browntop, sweet vernal, Yorkshire fog sward. It is easily established and maintained and with reasonable management will persist in the sward indefinitely; doing the splendid job of not only producing the essential nitrogen in as cheap a form as possible but valuable foliage as well. It is a valuable companion to short-rotation ryegrass because of the ability of good strains when established to come up with the short-rotation ryegrass to a height of 8 to 9in., which is essential for management of short-rotation ryegrass.

GRASSES

PRAIRIE GRASS

This is a species that it is difficult to assess the value of in Taranaki, as it has not been sown to any great extent. Its biggest drawback on seasonal dairying is its dormancy during the major part of the dairying season.

On the few town milk farms where it was grown it did have a very useful place which has since been filled by short-rotation ryegrass. It grows well on good fertility soils and provides a good bulk of feed in late

autumn and winter, is very palatable, and stock milk well on it. It will grow in association with perennial ryegrass and white clover and, if short-rotation ryegrass had not taken its place, I believe prairie grass would be used much more widely. It is quite easy to establish. on good fertility soils and can be seen flourishing in many Taranaki farms under hedges as a self-sown species.

COCKSFOOT

There is no doubt that, this grass has done much for Taranaki in building up its present level of fertility, and production. On the open or extensive type of grazing management cocksfoot has done and still is doing a good job.

Cocksfoot under Taranaki conditions makes quite fair growth even in winter (frost burns it a bit inland), does well in the late spring, and summer, and in association with perennial ryegrass and white clover under hard grazing conditions is quite palatable.

But with a system of grazing which involves an 18 to 20-day rotation, cocksfoot really thrives and herein lies its weakness, particularly as an associate of short-rotation ryegrass. It tends to clump badly, having a high crown, and becomes coarse and unpalatable at this stage. It would appear then that cocksfoot in association with perennial ryegrass is a good companion, but not with short-rotation ryegrass, which requires a lax system of grazing.

TIMOTHY

As you know, timothy likes high rainfall and low temperature conditions and does not mind a fairly high water-table. This would suggest that Taranaki would be ideally suited to it. But do not. forget that Taranaki soils are very free draining and observations indicate that only at a few places such as on the higher slopes of Mt. Egmont and around Oaonui is a farmer likely to get the best out of timothy. Even here it does not seem to fit in with pasture management- as practised, and: yet from time to time pasture that appears to have had little or no timothy in for years suddenly produces timothy as a dominant in the sward. A good example of this was given on a farm at Rowan 12 months ago. The pasture was due for ploughing so -the farmer pugged it badly in the winter and got a fairly heavy concentration of dung, which was spread

by harrowing., After one, grazing the, area was closed for 'a late silage cut-a cut that gave about an 8 ton per acre crop of silage, mainly timothy. Timothy has also been very hard to establish and has really only been' played with in Taranaki. The new strain of timothy developed at Grasslands (S48) is being sown in many pastures on the upper slopes of Mt. Egmont and' is establishing very well. It remains to be seen how it will perform in association with short-rotation or perennial ryegrass.

PERENNIAL RYEGRASS

One approaches discussion and criticism of this grass with some diffidence because of the splendid job it has done in the development of Taranaki pastures.

It has been the backbone of seed mixtures since the start of development and still is on many farms.

It establishes readily on practically all levels of fertility, has a wide range of moisture tolerance and stands up well under dry conditions. It is better than short-rotation ryegrass under drought conditions and hard grazing management and is quite palatable in its early stages of growth up to the 4 to 5in. stage. On sheep country and dairy farms where hard grazing is practised it is still the best of the ryegrasses.

Its weakness is that its winter and early spring growth is not as good as that of short-rotation ryegrass, recovery after grazing is not so rapid, and it becomes tough and unpalatable over the 5 to 6in. stage of growth. It has a period of dormancy in the summer. Though some claim that it continues growing longer into the dry weather than does short-rotation ryegrass and commences autumn growth earlier, this is not true in Taranaki and one wonders just what place perennial ryegrass will take in the future on a. well-run dairy farm. My forecast, for what it is worth, is that it will not be sown in association with short-rotation ryegrass, but will be sown on hillsides, sheep pastures, and in drought areas as a summer pasture (special-purpose).

SHORT-ROTATION RYEGRASS

Let me say right from the start that we still have a lot to learn about this most valuable and flexible species of ryegrass.

A lot can still be done and is being done to ensure or to improve its persistency and a lot has still to be learned of its growth requirements and management to ensure maximum production and utilisation.

One thing, however, is certain, that even on present-day performance in Taranaki, and if no further improvement takes place, it is the best of all the, dairy pasture grasses.

In the early days of short-rotation ryegrass it was included in mixtures to give a large bulk of feed in the first winter and spring. and it was hoped that it would persist beyond this period.

Seeding rates were something like 8 to 10lb. of short-rotation ryegrass in a 50 to 601b. seed mixture and it was not expected that it would persist. for long. Just how long was not known.

After two to three years' experience it was quite apparent that under hard, continuous grazing short-rotation ryegrass seemed 'to have disappeared, from the sward. But on farms where a lax system of grazing was used short-rotation ryegrass was still vigorous and appeared to have increased. What was more important was that short-rotation ryegrass grew as far into the dry weather as' did perennial ryegrass and when the autumn ' rain came short-rotation ryegrass was away. just as quickly as perennial ryegrass and grew faster.

An interesting'point relating to the persistency of short-rotation ryegrass arises from the reports of many farmers who claimed that this grass disappeared from the sward under the harder grazing imposed by summer conditions. However, the following winter and spring, pastures which were closed early showed quite vigorous growth of short-rotation ryegrass. This was explained later by the fact that short-rotation ryegrass does tend to change its form when hard grazed and at that stage it is difficult to distinguish-from perennial ryegrass. It was also felt in the initial stages of the introduction of short-rotation ryegrass that it was useless to sow it on other than very high fertility soils and that it required very special management. There is no doubt,-of course, of its performance on high fertility levels, but experience has also shown that short-rotation ryegrass can establish well at' lower. fertility levels and can be maintained well by good stock control.

Successful management involves in the main a good rotational grazing technique giving an 18 to 20-day rotation.

' Following the initial success of short-rotation ryegrass seed mixtures containing greater amounts of short-rotation ryegrass were sown, for example, 151b. of short-rotation ryegrass plus 15lb. of perennial rye-

grass, plus clovers. Then trouble started. The vigorous growth of the short-rotation ryegrass and lack of knowledge of its management caused suppression of clovers and this was followed by a bad slumping of ryegrass and then by a pure clover sward. Much lighter seeding rates were recommended and it was suggested that a straight seeding of 15lb. of short-rotation ryegrass, 31b. of white clover, and 31b. of red clover might offset this trouble if good management could be given.

As you can well imagine this suggestion was received with very mixed feelings by both extension workers and farmers. But as always, there were sufficient extension workers game enough to suggest to some farmers that they ought to have a go and sufficient farmers who were prepared to give it a go.

As mentioned previously experience in drought areas showed that short-rotation ryegrass could be completely lost from the sward under dry conditions. For this reason we did try to confine the initial light straight sowings of short-rotation ryegrass to areas where rainfall was pretty sure and even.

But fortunately, as it has turned out, there are farmers who do not wait for extension workers to suggest what they do, and some of the coastal boys also decided to have a go. After all, Taranaki only occasionally has anything approaching drought conditions, and the results they obtained from mixed swards of short-rotation ryegrass and perennial ryegrass encouraged these progressive chaps to try and get more of this short-rotation ryegrass, and they have not been disapnointed.

The oldest of these straight short-rotation ryegrass pastures are now going into their third season and are improving as the fertility is built up and better management, gained through experience, is applied.

We now have quite a few of these 151b. of short-rotation ryegrass, 3lb. of white clover, 3lb. of red clover swards in different parts of Taranaki and on widely different rainfall areas. Last season was I think the driest, particularly in South Taranaki, that we have had for years. However, I do know of two pastures (both in the same locality) spring sown 12 months ago from which the short-rotation ryegrass was completely lost. This was hard to understand, because it was in an area where conditions were. not. exceptionally dry and I feel that some other factor was involved in the loss of short-rotation ryegrass from these pastures. Both were

oversown with short-rotation ryegrass in the autumn and are going well.

This brings up an important point in favour of short-rotation ryegrass in that even if swards of short-rotation ryegrass do thin out or are lost, it establishes readily from oversowing and successful rejuvenation of pasture can be obtained in this way.

SUMMARY

As I see it today many of the grasses and clovers which have done sterling work in the building up of Taranaki grasslands are becoming secondary to short-rotation ryegrass and white clover swards and my appreciation of the main species is *as* follows:

Subterranean Clover. Useful on hilly country, and steep, undulating dairy farms and on sand.

Red Clover. Useful on extensive grazing and where heavy seeding rates are used. Where sown in light seeding rates should only be 1 to 2lb. per acre.

White Clover. Essential in all swards and the most useful of all pasture species.

Timothy. Too early yet to express an opinion about the new timothy. Do not consider the old timothy an essential species in general-purpose pastures.

Cocksfoot. Still a very useful grass on farms where open grazing is practised, but consider it an embarrassment in light sowings of short-rotation ryegrass and clover on a lax system of grazing.

Perennial Ryegrass. Still the most useful grass on open grazing, high and undulating country where drought conditions are fairly prevalent. Can be oversown with reasonable success, but not as readily as short-rotation ryegrass. Fail to see how the best can be got out of perennial ryegrass in association. with short-rotation ryegrass.

Short-rotation Ryegrass. In Taranaki a great partner for white clover. Producing much more feed than perennial ryegrass in winter and early spring and equally good as perennial ryegrass in late spring, summer and autumn. Again I fail to see how the best production and utilisation can be got from short-rotation ryegrass in association with perennial ryegrass and cocksfoot. Establishes very well by oversowing.

In conclusion I would say that practically anywhere in Taranaki we can establish and maintain in-

definitely good swards of straight short-rotation ryegrass-white clover pastures. The main limiting factor on farms where short-rotation ryegrass will not hold is management. We have a good climate and free draining soils. All we want now is for the Grasslands workers to produce a grass that will grow well from the end of December to the end of February and we will have the almost perfect dairy pastures.

DISCUSSION

Q. Under strip grazing in Taranaki can a prairie grass sward be maintained ?

A. On a property in Taranaki there have been about five acres of prairie grass for about 15 years and it has been strip grazed every year.

Q. How do you reconcile the fact that I can get better production from my old perennial ryegrass pastures in spite of the bulk of production of short-rotation ryegrass ?

A. I know the questioner is milking 71 cows on 70 acres on perennial ryegrass, but he could do better on short-rotation! He is a top-line farmer. Breeding, feeding and management are inseparable and that is the secret of his success with perennial ryegrass, but with short-rotation he could do even better.

Q. Would it be safe for me to sow short-rotation ryegrass or would it cross with my perennial ?

A. (Corkill): If you are going in for perennial ryegrass seed production, I would not recommend your sowing short-rotation, as they cross readily.
(Duncan) : Short-rotation. ryegrass seed persists in the ground and many perennial ryegrass seed crops have been rejected for certification on areas previously in short-rotation ryegrass swards that have been ploughed up and resown in perennial, even after 5 or 6 years.

Q. Can a perennial ryegrass-short-rotation ryegrass pasture be managed as well as a pure sward?

A. If you don't graze perennial ryegrass at. the 5 to 6in. stage you won't get the cows to eat it readily. Short-rotation ryegrass is very flexible and can be grazed at many heights. Two farmers sowed a mixture of 81b. of short-rotation and 20lb. of perennial. One hard grazed his pasture and it went to perennial; the other lax grazed his and it went to short-rotation. even with onlv 81b. of the short-rotation.
(Bell) : 'Auckland has a bigger climatic range than Taranaki and there are limited areas of moist soils of high fertility. We want to use short-rotation ryegrass over a much wider area than where conditions are ideal for it. Trials were established at Otorohanga with varying rates of short-rotation ryegrass from pure perennial to pure short-rotation. In grazing at one time in the spring the perennial was neglected and the short-rotation eaten close. The cow can't select short-rotation ryegrass out of a mixed pasture. If there is a proportion of short-rotation and perennial ryegrass in a pasture you can let it go higher. It is a more flexible pasture. If the short-rotation ryegrass goes

out in a dry summer you still have the perennial. We have advised farmers- to use 8lb. of short-rotation ryegrass and 20lb. of perennial, and later on more short-rotation and less perennial. If we could select a field that is moist and fertile we would advise them to use purely short-rotation, which would live a long time if not for ever in that paddock, but we have to be more careful in Auckland,in the advocacy of straight short-rotation ryegrass.

(Corkill) : Short-rotation and perennial ryegrass require different management. If we are going to get the most out of short-rotation and one of its most important attiibutes, its capacity to spread production, then it is best to'use a simple mixture. Farmers could have a certain area in simple short-rotation ryegrass mixtures and the rest in general mixtures containing some short-rotation ryegrass,

Q. Most farmers want overall production and the most. difficult period is December and January. Would the improved cocksfoot behave in the same way as the old strains under the same management? Does it produce the same clumpy type of growth ?

A. (Corkill): We are a long way from producing a grass that will grow in a dry summer. The new strain of cocksfoot on the market now, though a good summer producer and a longer seasonal producer, still has the cocksfoot tussock type of growth. If you control graze with the electric fence, cows can't select and the whole area will be grazed more evenly than if uncontrolled grazing is practised.

Q. Is there a place for meadow fescue for late summer grazing?

A. (Corkill): In England meadow fescue is used for that purpose: for a hay crop or pasture late in the season. It was not found at Grasslands to be a high producer. Cocksfoot. would stand up to harder conditions and give better production.

Prof. Calder: One of the mixtures we are keen on in Canterbury is short-rotation ryegress and timothy (2016. of short-rotation, 4 to 51b. of timothy, and white clover) to give a dominant short-rotation ryegrass pasture in 2 to 4 years. Then timothy gives a valuable contribution. We compensate for the water shortage by irrigation. In spring we got 90 per cent. of our production from the short-rotation; in January and February we watered and the timothy responded while the short-rotation didn't, and we got 50 per cent. production from each. Were high temperatures in January and February associated with the favourable behaviour of timothy and the 'low response from short-rotation?

A. (Mitchell): One would expect that, compared with short-rotation, the growth of timothy would be favoused by warm conditions. The rooting system of short-rotation, about the time it is going to seed, is not vigorous and it would deteriorate rapidly if growing conditions were unfavourable. There is a possibility that it was starting to suffer before irrigation was started. In that case the short-rotation would be slow to respond. It is necessary in the Waikato to start irrigating well before short rotation is showing drought signs.

Q. Is the disappearance of Yorkshire fog from Taranaki due to ploughing, better management, or topdressing?

A. A combination of them all. I am sure that closer subdivision has played a part, but there 6s a lot of fog still there. I am sure too that pasture management is improving each year in Taranaki.

Q. In Northland I sowed a paddock in short-rotation ryegrass and next summer it had to be irigated but did not respond, so I discontinued with it and put the paddock into paspalum and got much better results. Why did irrigation not keep the short-rotation going in summer?

A. (Mitchell): Mainly because it was in North Auckland where conditions on the alluvial soils are ideally suited for paspalum. The further north you go the more you could expect the results you got, and the further south the reverse.

Elliott: The growth of any plant is limited by the amount of water available to it. Short-rotation does not produce as well as other grasses under irrigation during hot weather.