

VALUE OF PASTURE SPECIES IN SOUTH AUCKLAND

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South Auckland for this paper is that portion of the Auckland Province south. of Auckland city. The farmed areas are about 97 per cent in pasture.

CLIMATE

The 'northern and east coastal areas of South Auckland experience a mild Mediterranean type' of climate. Only light frosts occur and rainfall and temperature are very suitable for autumn, winter, and spring growth, but there is usually insufficient rain from mid-December to mid-March and one year in about five is a drought year when very little effective rain falls during this period and the ground becomes parched and pastures brown.

The inland and southern areas are colder in winter with periods of heavy frosts necessitating the provision of more hay, silage, and roots for stock. The summer rainfall is more dependable, but droughts at the 5-yearly intervals can be expected, but are not generally of the same severity as in the, northern and east coastal areas.

Dry periods in summer are much greater hazards to dairy production than winter cold. They also reduce the amount of flushing feed for breeding ewes and can therefore affect lambing percentages in the following spring, but otherwise they are not much feared by the sheep farmer, except that they may give rise to facial eczema.

EXISTING PASTURES

The hills were covered in bush, much of which was felled, burnt, and sown to ryegrass, cocksfoot, and red and white clover pastures., but these deteriorated in a few years and now comprise browntop, sweet vernal, danthonia, and suckling clover, with *Lotus major* prevalent in the moister climates; *Paspalum dilatatum* sometimes present in the warmer districts; white

clover, subterranean clover, crested dogstail, perennial ryegrass and Yorkshire fog prominent in the higher-fertility spots. Mainly in coastal areas rats-tail is sometimes present in sunny aspects. Much of the country, however, has reverted mainly to manuka on the heavier soils and to fern on the lighter soils.

The lower lying country was largely in scrub with bush prevalent in some areas. On ploughed land the pastures vary from good ryegrass-white clover with cocksfoot or paspalum, to browntop, chewing fescue, danthonia, and suckling clover, dependent on management and soil moisture. Soil moisture except on certain droughty areas and on undrained swamps is suitable for ryegrass and white clover. *Paspalum dilatatum*, Yorkshire fog, *Lotus major*, and sometimes tall fescue are prevalent in poorly drained swamps; and on fertile lands flooded in winter, *Paspalum distichum*, *Glyceria aquatica*, and *Phalaris arundinacea* have a place.

Before the war there were large areas of *Paspalum distichum* in the swamps of the lower Waikato. This grass had supplied most of the fodder for stock grazing those swamps in the summer for up to 30 years. Lately, however, most of the *Paspalum distichum* on these swamps has been smothered by summer floods. The remainder of the swamps suitable for colonisation by swamp grasses are now being colonised mainly by *Glyceria aquatica*, which is a newer arrival than *Paspalum distichum* and which establishes more easily. It has eliminated much blackberry and rushes and other swamp growth and has destroyed a small area of *Phalaris arundinacea*. However, there is still an arm of the Mercer swamp a few acres in extent colonised by this grass.

Paspalum dilatatum is not common on the cold Central Plateau and inland King Country. It is extremely prevalent in the Bay of Plenty and common elsewhere. On the droughty soils of the Central Plateau the pastures quickly run to hairgrass and elsewhere to browntop, sweet vernal, *Poa pratensis*, Yorkshire fog, and suckling clover. On country moist enough for ryegrass and white clover, Yorkshire fog, *Poa trivialis*, and *Poa pratensis* are common even where the fertility is fairly high; and where the fertility falls away further browntop rapidly creeps in and claims ascendancy with suckling clover, ribgrass, and sweet vernal. Subterranean clover

is common on soils not moist enough for white clover to grow well in the late summer. Unless the soil is extremely dry in summer, the pasture contains both species and after a dry summer subterranean clover is more prominent. With higher fertility the sward forms a better cover in summer and the subterranean clover is ousted, but the seed remains in the soil, the evidence of which is apparent if the area is ploughed or there is a lowering of fertility. On highly fertile, well-drained soils which retain a good supply of moisture in the summer, annual types of ryegrass and highly productive strains of white clover have asserted themselves and these are frequently associated with prairie grass and in coastal areas with paspalum.

PLACE OF IMPORTANT SPECIES

Ryegrass: The aim of almost every farmer should be to increase the amount of ryegrass in his permanent pastures. Exceptions are extremely dry and very wet soils. Ryegrass can belong to two main types: perennial and Italian. Perennial ryegrass will withstand drier soil conditions, much harder grazing, and lower fertility than the Italian types. On extremely fertile and moist country short-rotation and other ryegrasses with a preponderance of Italian blood should be the chief or only ryegrasses present in the sward. On soils subject to a fair amount of drying out and particularly those grazed by sheep and where the fertility is not of a very high level perennial ryegrass should be the dominant ryegrass in the sward. In between these two extremes, short-rotation ryegrass comes in more or less as a co-dominant with perennial ryegrass.

Italian ryegrass has its place in temporary pastures lasting one or two years.

Paspalum dilatatum: This grass is well established in most districts where it is needed, and consequently the sowing of it is limited only to coastal areas being brought in from scrub. On many farms, chiefly on coastal areas and particularly in the Bay of Plenty, there is insufficient ryegrass in the pastures to balance the paspalum, which consequently dominates the sward. This is caused mainly by:

1. Low fertility and
2. Droughty soils.

It can also be caused, by bad summer management

of the paspalum allowing it to run to a rank growth which smothers the ryegrass and white clover. III a well-balanced, highly productive ryegrass-white clover-paspalum sward the pasture looks entirely ryegrass-white clover in the winter and early spring and dominantly paspalum-white clover with much ryegrass in evidence in the summer. Such a sward is perhaps the most highly productive of all. It unfortunately is not very commonly seen, because very good management is needed and the soil must not be too droughty. Because of its greater winter and spring production, and because paspalum has a very good autumn production, short-rotation ryegrass is a better companion plant of paspalum than perennial ryegrass.

Paspalum has a place where the climate is so mild that it makes good summer growth. It appears to be of great value in the north end of the area and along the coast. It has no place on the Central Plateau, where it is replaced by cocksfoot. In the Waikato its position is doubtful.

It is of greater value to the dairy farmer because of his greater fear of summer droughts than to the sheep farmer. Nevertheless the sheep farmer on dry hills of the north welcomes its presence. If the fertility is allowed to fall so that clovers are not well represented in the sward in a flourishing condition, the production of paspalum on dry hills is negligible and this applies, of course, to any grass. Paspalum is frequently incorrectly blamed for this state of affairs because it is practically the only grass left. Other grasses have died under the difficult conditions. This also happens on rolling and flat land where fertility falls, to a low level or the summer management is too lax. Again the paspalum, practically the only plant left, receives the blame for the poor returns then being received from such pastures.

Cocksfoot: On the coastal and northern areas this grass has been ousted to a large extent by paspalum. Therefore it is more prevalent in the inland areas and except in the extremely fertile and moist soils is present to a fair extent, particularly under dairying. The type of management resulting from the use of the electric fence on dairy farms is increasing its prevalence, because it likes fairly lax grazing. Under such conditions short-rotation rye grass is a better companion plant than perennial rye grass. If this type of grazing is not carried out to extremes, the white clover is not harmed and dairying pasture appears to be

evolving toward a short-rotation ryegrass, Eocksfoot, pedigree' strain white clover, and perennial ryegrass sward which should prove highly productive and give a more even all-the-year-round production; with cocksfoot giving a fair amount of summer growth besides giving its quota at other times of the year.

Before the introduction of the electric fence lax grazing could not be carried out without resulting in uneven grazing and under high fertility conditions the infestation of fields with Yorkshire fog. Consequently grazing methods were generally fairly tight and this was suitable for perennial ryegrass and white clover. In the past; a cocksfoot dominant sward was usually associated with failure of perennial ryegrass and white clover due to fall in fertility, dry conditions, or smothering. A cocksfoot dominant sward was usually therefore unpalatable because of low clover content, and low producing. In other words, as with paspalum, cocksfoot sometimes received the blame for the bad conditions because it was the chief grass left and because it was the only one that withstood the harsh treatment imposed, on the sward.

Yorkshire Fog : This grass is suited to a very wide range of conditions and is useful where conditions are most difficult: on fairly dry or rather wet soils and where the fertility is low. It is also prevalent in the best pastures. Here it is considered harmful because it forms a mat which is very liable to smother white clover. It should, therefore, be kept in check. This was difficult when lax grazing was attempted before the introduction of the electric fence. Yorkshire fog can be considerably reduced in a pasture by what is now called wintering on these fields. This simply means the concentration of dairy cows when dry on these fields and feeding them adequately with silage and hay. The fields are consequently very, closely grazed and tramped fairly bare and frequently made very muddy. If necessary, the fields can be oversown in the early spring.

White Clover : Except on the more droughty and very wet soils, white clover should be the chief if not the only clover of permanent swards. On the extremely fertile and, moist soils a highly productive strain probably equal to pedigree appears to have evolved. On such soils a poor type of white clover is soon subdued by the natural clover, and only pedigree strain white clover is respected. The pedigree strain white clover is much superior to the natural strain on other soils

and should always be sown there except under hard grazing conditions. In such conditions on hill country Kentish wild white clover is more suitable and possibly under such or similar conditions pedigree white clover is not as suitable as other not so vigorous New Zealand strains.

Subterranean clover has a place with white clover in soils liable to dry out, on droughty soils where white clover will not exist, and on soils subject to hard grazing. Here the Tallsrook strain is much superior to Mt. Barker, which may not hold under such conditions. Subterranean clover is very suitable under sheep farming, because it produces a bulk of palatable milk food when it is most required by the lambs.

Lotus major: This clover is most prevalent under difficult conditions. Where the ground is too dry, too wet, too infertile, or too salt, there will *Lotus major* probably exist. Also where management is too lax it will survive and fight its way to light through fern and rusk. It is a wonderful pioneer, in peat soils, which are frequently deficient in plant foods and are at times too wet and other times too dry. *Lotus major* is common on the steep slopes of our moister hill country where it exists in spite of lowering fertility and invasion by fern. It is replaced on hills by subterranean clover where conditions are too dry for a permanent clover species to survive. Under better conditions of fertility *Lotus major* succumbs to white clover.

Red Clover: Under normal pasture management this clover usually lasts only three or four years in the sward. However, because of its high summer production for that period, it is included in permanent pasture mixtures. Because of its higher production broad red clover is preferred to Montgomery red clover, which in most trials, has not lasted any longer than broad red clover.

Swamp Grasses: Here and there throughout the Auckland Province there are areas of fertile wet land which naturally grow raupo and New Zealand flax. Some of these areas can be drained and pastures suited to dry land planted which will give all-the-year-round production or they could be planted in swamp grasses suited to the conditions. These swamp grasses produce large amounts of fairly nutritious fodder. One of these grasses, *Glyceria aquatica*, is liable to block canals and waterways and so should not be planted where it will spread to such areas. Farmers with areas of land

flooded in winter and yet reasonably dry in summer should consider whether it pays to expend much money to drain the areas so that ryegrass and white clover can be established or whether they will arrange for the area to produce large amounts of summer fodder at little or no expense by introducing swamp grasses.

DISCUSSION

Smallfield: It seems desirable to pay more attention to water grasses and their place in New Zealand farming. We are inclined to treat all classes of land alike. The aim in most low-lying swampy ground is to drain it and try to turn it into ryegrass-white clover areas. We are spending large amounts on river protection and drainage, works which generally require very costly maintenance. Mr Bell spoke of the Mercer area, where there are areas of water grasses and swamp not much above sea level. It is a natural ponding area for the Waikato and there is practically no drainage, off it. The present idea is to drain it with a system that will require costly maintenance. The Association could give consideration to water grasses, as I am sure they will have a very important place in pastures in New Zealand.

- Q. Will paspalum play a part in bringing in some of the hard country of Nelson? Would temperatures be sufficient?
- A. Much of Nelson is too cold in winter, but paspalum does reasonably well round the coast.
- Q. Is it desirable, as a matter of long-term policy, to advocate the use of Kentish White, which has a much lower potential than the pedigree strain? Over the last 20 years enormous strides have been made in changing the root environment to promote good clover growth. Would this not be a better approach than the recommendation of persistent but inferior strains?
- A. Many farmers in Auckland are in areas where fertility is low. Unfortunately they overgraze their pastures and under these conditions we have to provide something that will suit them now. We hope in time to persuade them to raise the fertility to suit better species, but for many years to come a lot of farmers will be farming under low levels of fertility and will need something of lower production potential. From some experimental surface-sowing trials we have concluded that Kentish white clover has a place on lower fertility hill country.
- Q. (Lynch): Is there any place for improving the type of paspalum in New Zealand?
- A. (Bell): In South Auckland the area sown in paspalum is small, but in North Auckland, where large areas are being developed by the State, sowings of paspalum are large and if a superior strain could be produced rapidly enough there would be a use for it, but the Grasslands Division would have to work pretty rapidly.

Corkill: With paspalum the position is not nearly the same as with other strains. Paspalum breeds true and there is not nearly the same chance of variation in plant type. It is very problematic whether we could make much improvement.

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- Q. Would there be the same difficulty [in regard to breeding true] with crested dogstail as with paspalum?
- A. (Jacques) : There are quite wide variations in crested dogstail. Commercial lines of dogstail are not the best. The first harvest is not so good as that from a line allowed to grow for a number of years. Seed is best from old pastures and roadsides. The best selection was made from a Kentish line. It is not considered advisable or necessary to take selection further. The trouble is that dogstail is comparatively low producing and even if selection increased its production 20 per cent. it is still not a good grass.
- Q. Has the cocksfoot referred to by Mr Bell been in the Auckland pastures a long time? If not, what sort of results are being got by farmers putting it in? What is its establishment in relation to competition from clover and short-rotation ryegrass?
- A. It is just naturally evolving, generally in pastures that have been down a long time. Farmers are oversowing short-rotation ryegrass and it is spreading over the whole farm, although it may be sown only in one paddock. The electric fence is suitable to the development of a short-rotation ryegrass; cocksfoot, and pedigree white clover pasture. Such a pasture has only been evolving for a few years now and we are watching it with interest. There have been no real efforts to sow that sort of pasture. You certainly get a very small percentage of cocksfoot in oversowing. It would be more prominent through the use of the electric fence. Both cocksfoot and short-rotation ryegrass like lax grazing, but it is not so suitable for perennial ryegrass.