Establishment of Pasture on Peat in Ashburton County

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THAT good pastures can be established on the peaty soils of Ashburton County, which cover about 8000 acres, has been shown in trials by the Department of Agriculture. A thick, healthy sward must be established as soon as possible to counter weed growth, and the ability of perennial ryegrass to grow quickly and form a good cover makes its inclusion in the seeds mixture essential. Recommendations for the preparation of the seed-bed and the seeds mixture are given in the following review of the results of the Department's trials.

THE peaty soils in Ashburton County vary from 12 to 20in. of dark brown, fibrous, loamy peat to 6 to 8in. of peaty silt loam and peaty clay loam. About 1600 acres of the deepest and most fibrous peat lie between Eiffelton and Lynnford, near the Hinds River. The area is low lying and until recent years has been very hard to drain.

In its undrained state strong clumps of rushes are prevalent, the herbage between the rushes being dominantly Yorkshire fog (*Holcus lanatus*) and old man twitch (*Agropyron repens*). Attempts have been made at various times to establish pastures. The practice of using poor types of perennial ryegrass, sown down with other crops, gave this grass a bad name and of late years it has been replaced mostly by Italian ryegrass. The short life of Italian ryegrass combined with waterlogging of the soil was not conducive to long life of the sward, which quickly reverted to a thick mat of Yorkshire fog. This was a very expensive and discouraging process. Since the South Canterbury Catchment Board provided main drains through this area most of the waterlogged soils can be drained.

Pasture Trial

Trials to find out what grasses, clovers, and fertilisers would best suit this class of land were laid down by the Department of Agriculture in 1949. A suitable area of land freshly ploughed out of rushes and Yorkshire fog could not be found, so it was arranged to use part of a paddock which was slightly drier and where the fibrous texture of the peat had been partially broken up by cultivation over a number of years. Twelve plots were sown, each containing a different mixture of grasses and clovers. The remainder of the field was laid down in short-rotation ryegrass, oats, and white clover. Italian ryegrass had been harvested from the area in the summer of 1947, after which it was grazed and then ploughed in November 1948 and fallowed until sown on 10 March 1949.

The plots were sown with mixtures containing various combinations and seeding rates of the following grasses and clovers: Perennial ryegrass, short-rotation ryegrass, cocksfoot, timothy, *Phalaris tuberosa*, crested dogstail, alsike, white clover, Montgomery red clover, cowgrass, and *Lotus major*.

Superphosphate at the rate of 1cwt. per acre was sown with the seed, and one half of each plot received a dressing of carbonate of lime at the rate of 2 tons per acre.

The autumn and early spring of 1949 were fairly dry. Germination was good, but little growth had been made at the beginning of the first winter. The plots containing most perennial ryegrass gave the best cover at this stage, those with the general mixtures also being quite good. Timothy, cocksfoot, and phalaris plants were small and where they had been sown without ryegrass they produced very open swards. In the late spring these grasses were still small, but the clovers made excellent progress in the plots where there was little competition, growing much stronger than those competing with ryegrass. At the same time the ryegrass-dominant plots were producing the most feed.

Throughout the first summer the clovers, especially the white clover, made excellent growth, with limed plots much superior to those not limed. Alsike grew well at this stage, but Montgomery red clover did not show to advantage until the autumn of 1951 after the area had been closed up for some time. *Lotus major* did not become established. Perennial ryegrass grew very well, but short-rotation ryegrass in the rest of the paddock and in the trial plots had practically disappeared by the autumn of 1951.

A simple mixture of grass and clover makes a good sheep-grazing sward.

Good-quality perennial ryegrass is still the best all-round grass on the trial, especially for sheep feed. In a simple mixture with white clover or in the more complex mixtures it established early, made a good cover, and has provided a large amount of feed. Short-rotation ryegrass on the other hand did not last more than 10 months, giving no more feed than perennial in that time. Timothy was disappointing. Where sown with clovers only it grew very slowly and could not compete with Yorkshire fog. Cocksfoot made better progress than timothy, but was slow to establish where sown on its own. It appears to be a very useful grass in mixtures. *Phalaris tuberosa* has been a little better than cocksfoot throughout the trial. It has made better progress on peat than in trials on other soil types in Mid-Canterbury. Like timothy and cocksfoot, when sown without ryegrass, it produced an open sward, favouring the ingress of Yorkshire fog and weeds. Phalaris made a useful addition to the growth of the sward when included in grass-clover mixtures. Although crested dogstail has at no time been dominant, it was useful in helping to fill the bare spaces and provide a better ground cover.

White clover was the best of the legumes. Alsike did not show up well until the second spring. Montgomery red clover was also slow to establish itself and did not provide much bulk until the second summer. Cowgrass was no better than Montgomery red clover at any time.

There has been a good response to lime on this trial. Clovers have grown better, resulting in the grasses being more palatable to stock. There is still a good balance of clovers and grasses on the limed areas.

The aim must be to establish a thick, healthy sward as soon as possible, to discourage weed growth, especially lady's thumb or redshank (*Polygonum persicaria*) and Yorkshire fog. For this purpose a little extra care in preparing a good, firm seed-bed after germinating and killing as many as possible of the weed seeds in the topsoil is well worth while. Perennial ryegrass must form the basis of all seeds mixtures. Because it grows quickly and forms a good cover it is the premier grass for these conditions. Clovers are essential to maintain the nitrogen supply to the grasses as well as giving a better balanced feed. A good balance between grasses and clovers should be sought, and the application of 2 tons of carbonate of lime per acre before sowing is essential. Phalaris and cocksfoot are suitable for including in a mixture for cattle grazing, as they spread the season of growth and may prolong the life of the pasture. Under close sheep grazing they do not establish quickly enough and are suppressed by selective grazing.