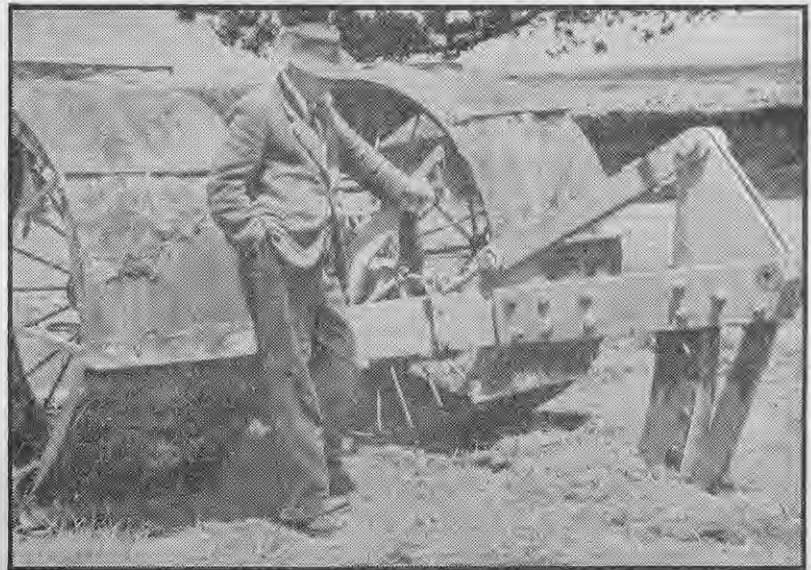


size of seedlings on the drier hummocks where germination was slower. Six weeks after sowing there was little difference between the hummocks and the hollows, and counts of 250 clovers and 500 grasses per square yard were obtained. Subsequent counts showed a decrease in the numbers, particularly in the clovers. At the last count (August 1950) there were about 100 clovers and 350 grasses per square yard. As the pasture was not sown until 24 April, some loss of clovers through frost lift was to be expected.

By July bare patches started to develop in the paddock and became progressively more noticeable during August and September with the spring growth. Analyses showed that these bare areas were more acid and more deficient in lime than adjacent areas carrying good pasture. The bare areas were generally in strips across the paddock and were attributed to portions being missed when the lime was applied after ploughing. The surface at this stage was too soft to hold the narrow wheels of the topdresser, so the lime was put on by a rotary distributor attached to a trailer on aeroplane wheels. Apparently some runs with the distributor were too far apart, leaving strips with little or no lime and where the peat was too acid for the survival of the seedlings which had germinated.

Strips of Good Clover Growth

As the pasture improved in November and December the paddock became marked by another series of more frequent strips across the paddock. These were strips of good clover growth several feet wide and about 20ft. apart that were attributed to the heavy application of lime which fell immediately behind the rotary distributor. The lanes in between, corresponding to the edges of adjacent runs with the distributor, had sufficient lime for the establishment of Yorkshire fog, ryegrass, and some clover, but not enough for good clover growth. The lime thrown to the sides of each run would include the coarser particles, which according to the figures in Table 2 are much slower than fine material in reacting with acid peat. Similar weights of the various fractions of lime were mixed with peat and the pH was determined on the same day, after 5 weeks, and again after 10 weeks. After being



A ditcher modified for mole draining peat. The weight is distributed by the extensions to the wheels so that the $1\frac{1}{2}$ -ton implement can be used on very soft peat. When it is in working position as shown, with the beam well above the ground, this mole plough can be used on unimproved peat in rushes and short scrub.

mixed with the lime the peat was moistened with water and kept in stoppered flasks to prevent its drying out.

TABLE 2—EFFECT OF FINENESS OF GRINDING OF LIME ON pH OF PEAT

Fineness of grinding of lime	pH of peat		
	1 day	5 weeks	10 weeks
No lime	3.7	3.7	3.7
Retained on 8 mesh	4.0	3.7	4.3
Passed 8 mesh, retained on 16 mesh	4.0	4.1	4.5
Passed 16 mesh, retained on 30 mesh	3.9	4.2	4.8
Passed 30 mesh, retained on 60 mesh	4.0	4.7	5.3
Passed 60 mesh, retained on 120 mesh	4.0	5.1	5.2
Passed 120 mesh	5.5	5.3	5.0

The results set out in Table 2 show that coarse lime has very little effect

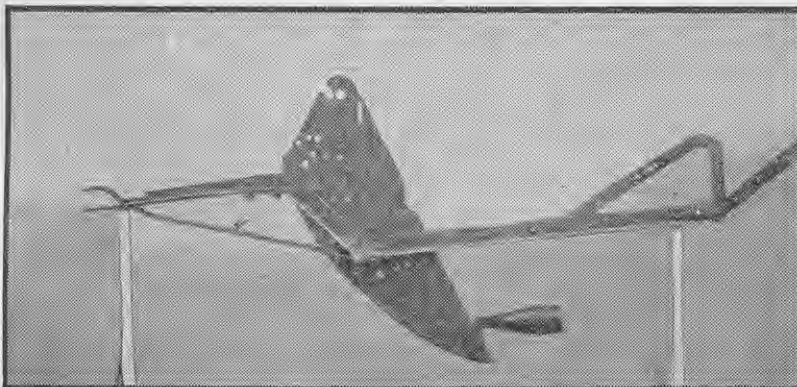
on the peat, even after 10 weeks, whereas the fine material reacts immediately. This suggests that coarse lime, even if applied in sufficient quantity, may be so slow in reacting that clover seedlings may germinate and then die before the pH is raised sufficiently for their survival. The minimum pH figure for good pasture establishment has not yet been determined. Peat at pH 4 is too acid, and pH 5 is satisfactory, but higher figures would be better. The minimum figure is probably about pH 4.7.

If a distributor which throws the coarse particles to the outside is used, the runs should be close enough to give sufficient overlap to ensure that the whole area has a dressing of at least some of the finer material.

Importance of Even Distribution

As most unimproved peat is deficient in plant nutrients, evenness of distribution of fertilisers is equally important. In one portion of the new pasture there was a poor strip which according to appearance and analyses was obviously suffering from phosphate deficiency. Apparently this strip had been missed when the serpentine superphosphate was put on by hand before the pasture was sown.

To enable the topdresser to be used on the cultivated peat so that the lime and fertilisers could be distributed more evenly in subsequent experiments wooden cleats were attached by U bolts to the rims of the wheels of the topdresser. Ten cleats each 14in. long of 4in. x 1in. hardwood were used on each wheel. The topdresser, fitted with these attachments, as shown in the illustration on page 9, was able to travel over soft peat in winter without difficulty. With only 10 cleats on each wheel the topdresser bumped somewhat when in motion.



An adapted mole plough used in Rukuhia trials. Use of a curved blade without a torpedo enabled any roots not cut to be pushed below the plug. The blade thus remained clear of roots and was able to cut through or push aside light timber.