

years to warrant inclusion except in limited quantities. These short-rotation pastures, consisting mostly of perennial rye-grass, are eminently satisfactory during the first year, but the rye-grass soon becomes weak, and in general they require to be ploughed up before the end of their third year. This system of short-rotation pastures to be ploughed up as soon as they have run out has been general in the South Island for many years, and is highly unsatisfactory from the upkeep of soil-fertility standpoint. Rotation grassland, apart from the feed it produces, must be looked upon as the humus-renovator in the cropping system. The rye-grass pastures of the South—and this refers more particularly to the lighter lands of Canterbury—are markedly inefficient in this respect. What is required are pastures that at the end of their third or fourth year will yield large amounts of organic matter when they are ploughed under. A more extended use of cocksfoot in short-rotation grassland would tend in this direction.* Without doubt, fairly heavy sowings of cocksfoot should be a feature over all the light land of the South Island, where this grass is at the present time studiously avoided. A typical Canterbury mixture would consist, roughly, of 20 lb. of perennial rye, 3 lb. of clovers, with perhaps 2 lb. of Italian rye, and from 1 lb. to 2 lb. of cocksfoot. The seed is generally spring-sown with a cereal—oats in the majority of cases—and often the cocksfoot, owing to the dry conditions engendered by the cereal to be harvested, does not establish at all.

Apart from modifying the mixtures so as to make cocksfoot the dominant ingredient, it will be necessary in the drier soils of Canterbury to either spring-sow apart from a harvested cereal or autumn-sow if lasting and productive pastures are to be secured. The superior results following sowing grass with rape or soft turnips clearly indicate that spring sowing with a harvested cereal is an unound practice. However, as oats often end the annual crops of a rotation and grass of necessity has to follow, autumn sowing following oats is advocated for the establishment of pastures largely of cocksfoot, provided the season has not been exceptionally dry and the oat crop has not exhausted the water resources of the soil. Under such circumstances the late autumn sowing of green-feed oats followed by spring sowing of the grass should be adopted. The type of mixture I should advise would be somewhat as follows: Cocksfoot, 12 lb.; rye-grasses, 10 lb.; clovers, 4 lb.; and perhaps 2 lb. of crested dogtail.

On the Ashburton Experimental Farm the value of heavy sowings of cocksfoot for rotation pasture is well shown. The land is of a distinctly poor character, the soil being thin with gravel coming close to the surface. The ordinary rye-grass mixtures run out after the second year, and give virtually no feed during the summer and autumn. On such land excellent results have followed the sowing in early March of the following mixture: Cocksfoot, 15 lb.; Italian rye, 3 lb.; perennial rye, 5 lb.; crested dogtail, 2 lb.; cow-grass, 2 lb.; white clover, 1 lb. At the end of two years this mixture has resulted in an excellent pasture of cocksfoot, crested dogtail, and clovers, and it is also noticeable that the rye-grass plants are markedly more vigorous.

* Dr. Hilgendorf, in his book on New Zealand pastures, well points out the value of cocksfoot for largely replacing rye-grass on the short-rotation grassland of Canterbury.