

cocksfoot under more or less continuous grazing, which is the treatment generally accorded New Zealand grassland, rarely produces any seed-heads. This is especially true on sheep pastures, and applies also to cattle and dairying grassland, except on the ungrazed patches surrounding cattle-droppings.

This non-seeding of grazed cocksfoot is one of its most important characteristics from an establishment point of view. It emphasizes the fact that the amount of cocksfoot in a pasture will depend primarily upon the amount that is sown and on the number of plants that will be established during the first few months following sowing. In general, comparatively no increase in the number of cocksfoot-plants occurs in the seasons following sowing, and, as will be pointed out, a reduction in the number of plants generally occurs. Thus any increase in the amount of ground occupied by cocksfoot will in all cases be due to increase in size of individual plants alone. Again, the ability of individual cocksfoot-plants to cover any considerable area depends very largely on whether or not vigorous plants have been developed during the season following sowing. Where excessive amounts of Italian rye are used the cocksfoot-plants are in general small and weak in the year following seeding. As the cocksfoot is kept hard grazed down it stands little chance of developing vigorous plants after the Italian has disappeared. There is no doubt that the failure in many parts of the North Island to establish good cocksfoot pastures in the renovation of bush-burn grasslands is due to the excessive use of Italian rye coupled with overstocking before the cocksfoot-plants are properly established.

Some very instructive examples of the depressing effect of Italian rye-grass on cocksfoot-establishment are afforded at the Central Development Farm. In one paddock of temporary pasture 4 lb. of cocksfoot per acre was included in a number of plots where Italian rye and prairie-grass were the main grasses used. In the rye-grass plots Italian was sown at the rate of 24 lb. per acre. In the first year the plots were heavily grazed in the winter and spring, and two hay crops were also harvested. The amount of cocksfoot in the hay was nil, what plants there were in the plots not being sufficiently high to be cut by the mower. In the prairie-grass plot, where the same amount of cocksfoot was used and 60 lb. of prairie sown, considerable amounts of cocksfoot were present in the second crop of hay, and the plants were large and vigorous. In the second year the plots were again grazed, mainly with cattle, during the winter and spring, and another hay crop harvested in December. On going over the field shortly before cutting, very few cocksfoot-heads could be seen in the Italian-rye plots, while the prairie plot contained ten times the number, and the cocksfoot-plants were strong and vigorous, yielding an abundance of herbage.

Again, in the autumn of 1918 a field was laid down in various plots in each of which cocksfoot at the rate of 14 lb. per acre was sown, together with other grasses and clovers. Two plots of 4 acres each were sown with the same mixture, except that one contained no Italian, while the other had 10 lb. included. The difference in the cocksfoot in these two plots has been most marked. In the December following, or eight months after sowing, a splendid thick growth of cocksfoot had been produced on the no-Italian area, while where Italian had been used the cocksfoot-plants were small and scattered. Any one viewing