

## DETAILS OF TRIALS AND TECHNIQUE EMPLOYED.

The trials include (1) broadcast plots, (2) turfs or seed of rye-grass from various habitats planted or sown in rows, and (3) single spaced plants.

## (1) BROADCAST PLOTS.

Where sufficient seed is available broadcast seedings are made, and the standard plot adopted is  $\frac{1}{500}$  acre in area, the measurement being 30 links by  $6\frac{2}{3}$  links. The amount of seed sown is 40 lb. per acre. These plots are sown in duplicate, and are subdivided transversely into three parts to allow a triple system of utilization to be carried out. One part is mown consistently once every week with a lawn-mower; the second part is mown with a motor hay-mower when the grass is in the 6 in. to 8 in. "cattle" stage; and the third portion is similarly cut at the hay stage when the grass is in flower. No reseeding is permitted to take place. The plots are uniformly manured with super-phosphate and sulphate of ammonia, and a high standard of soil-fertility is maintained throughout the period of the trials.

Detailed observations have been made from time to time on the behaviour of each line under this triple system of utilization, and a system of relative marking by eye estimation is employed. A scale of marking, 0-10, has been adopted in respect of differences between plot and plot. Establishment, relative growth, persistency, recovery after cutting, type as shown by morphological and colour differences, swarding characteristics, and disease resistance or susceptibility are measured in this way. Eye estimations in regard to persistency and swarding characteristics under weekly cutting are wherever possible supported by accurate statistical analyses of the sward *in situ*, using the point-quadrat method.

No stock-grazing has been done on the trial plots under consideration, but the same lines or representatives of the same types have been sown out in the field on all the leading soil-types in New Zealand, and the behaviour of each line or type in the field is closely correlated with that in the mown series at the Plant Research Station. All told, 3,590 plots of rye-grass, representing some 300 different lines, have been sown out and are under grazing trial in the field. These field trials are yielding important data which it is hoped will form the subject of a subsequent paper by the writers.

In the trials at Palmerston North no effort has been made to secure cut weights of herbage produced by each line or type. We are of the opinion, so far as species and strain trials are concerned, that mere weights as such, without further and complete botanical analyses, are not worth while. The need for botanical analyses of cut herbage, if weights are used as a measure of increase or decrease, can be readily seen from a glance at Table 7. The enormous increase in white clover would largely counteract loss of rye-grass as far as the weight measure was concerned, and this could be shown only by dissecting out and separately weighing the components of the cut herbage of each plot, or by some comparable system of accurate estimation of the botanical content of that herbage. From our experiences with a limited working staff it is more practicable in preliminary trials where wide differences occur to concentrate on the testing out of a large number of lines; and