

## PLANT-BREEDING AT CANTERBURY AGRICULTURAL COLLEGE.

### WORK ON CEREALS, GRASSES, AND RED CLOVER.

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#### I. HISTORICAL OUTLINE.

By the year 1860 wheat-growing was an established industry in Canterbury, and the area devoted to this crop expanded continuously until 1880, when the average annual area amounted to 300,000 acres. During the earlier part of this period very numerous varieties of wheat were introduced, but by 1870 the commonly used varieties had become narrowed down to Tuscan, Hunter's, and Pearl, and this has governed the millers' and merchants' classification of New Zealand wheats from that time to the present day. Individual farmers, of course, still made occasional importations, but none of these (except Solid-straw Tuscan) was able to establish itself, largely owing to the fact that the old varieties had become wind-resistant by natural selection, while new introductions were badly shaken by the nor'westers.

During all this period there was no attempt at improvement of seed. New strains of the old varieties could not be introduced from England because they had gone out of cultivation there, so that even the names were lost, and there was no idea of systematic improvement from within. An occasional farmer rogued a few acres for seed, and a fairly clean crop was eagerly bought up by neighbours, but on the whole the different varieties were extremely mixed and impure. In 1909 an average crop contained 20 per cent. of impurities, and in many cases the wheats in a field were so mixed that it was impossible to guess which variety the farmer had intended to sow.

In 1910 Mr. R. E. Alexander, present Director of this College, suggested that an attempt be made to improve the wheats of Canterbury by the method of pure line selection, which had proved so successful with barley in Ireland, and the work was entrusted to the present writer. It was carried on in a small way out of the slender resources of the College, but in 1915 the first success had been achieved and the pure line known as College Hunter's had been distributed. In 1920 the Government, through the Department of Agriculture, provided for the continuance and extension of the work by making an annual grant of £500. Selection of oats was then undertaken in addition to further work on wheat. In 1921 the limit of improvement by selection among our New Zealand wheats appeared to have been reached, and crossing among pure strains was commenced.

In 1923 an extensive series of crosses was made between New Zealand wheats and the most promising of those from other parts of the world, and at the same time a very modest start was made in the selection of grasses. This work looked so promising that in 1925 the Department of Agriculture increased its annual grant to £1,000, and an assistant, Mr. J. W. Calder, was appointed to help in the work.

Selections of cocksfoot and rye-grass were made, not from the vicinity of the College alone, but from all the chief sown-grass areas