

Soil Microbiology.—Techniques relating to the study of soil Actinomycetes have been developed, and microfloral changes associated with boron and fertilizer applications to the OMU suite of soils, Auckland, have been traced. Morphological descriptions and physiological studies have been made on isolates of Actinomycetes. Antibiotic activity has been demonstrated, especially with *Actinomycetes dermatonomus* from lumpy wool.

Plant Pathology.—Laboratory and field studies of speckled-leaf blotch of wheat and the causal organism (*Septoria tritici*), including host range studies, have been completed. Results indicate the pathogen to be highly specialized in this country, being confined to wheat. Field and glasshouse trials with twenty New Zealand wheat varieties have yielded no resistant varieties.

Investigations on powdery-mildew of wheat (the life history, incidence, and host range of the fungus *Erysiphe graminis tritici*), have been carried out, including a study of the infection types on immune, resistant, and susceptible wheat varieties. Over 174 wheat varieties selected from the Wheat Research Institute collection were recorded for mildew infection with two races of the wheat mildew present in New Zealand.

PASTURES ON LIGHT LAND

Mr. J. W. CALDER and Mr. C. E. IVERSEN

The annual fertilizer treatments were continued on the established subterranean-clover stands in series "A" (5 cwt. of lime and 1 cwt. of superphosphate in alternate years) and in series "B" (2 cwt. of superphosphate annually). Seasonal production was measured by means of protected quadrats. Series "A" produced 1,217 lb. of dry matter up to 31st January, and series "B" produced 1,046 lb.

The newly-sown pasture mixtures in series "D" (sown February, 1948) and those in series "C" (sown February, 1949) performed reasonably well considering the extremely dry season. The production from the "D" series—second-year pasture—averaged about 100 per cent. more than the established subterranean-clover pastures in series "A" and "B."

Of the different pasture mixtures, those which were predominantly ryegrass—both first- and second-year stands—produced considerably more than those which were predominantly cocksfoot or phalaris.

SOIL FERTILITY

Mr. H. D. ORCHISTON

The long-term soil-fertility project initiated in 1946–47 has been carried forward. The objective is to study (1) the interaction of the soil and the wheat crop as influenced by four rotations designed to produce different levels of fertility; (2) the effect of four cultivation treatments for seed-bed preparation; and (3) the effect of eight fertilizer treatments.

All crops established well, but yields were low as a result of a very dry season. Significant differences within and between rotations were recorded, but not between cultivation and fertilizer treatments.