

RESEARCH WORK AT CANTERBURY AGRICULTURAL COLLEGE, LINCOLN.

(1) PASTURE INVESTIGATIONS.

Investigations of pastures have been carried out under two separate headings—

(a) *Complete Farm under Control*.—The supervision and management of the entire mixed farm intensively worked from the point of view of net returns has been carried out. The results definitely show that by efficient utilization of pastures and other fodders not only can the numbers of stock carried be increased, but the net returns of a farm can be materially increased.

(b) *Control of Pastures: Manurial Trials*.—Some twenty-seven half-field grass manurial trials with different fertilizers on various types of pastures, soils, and in different localities are under observation and controlled grazing. The results show that (1) a very definite increase in the carrying-capacity can be obtained by efficient utilization—i.e., controlled grazing of pastures; (2) the top-dressing problem in Canterbury has just been touched on; and (3) the measuring of returns from fertilizers in Canterbury on some good soils and pastures, calculated by the increase in carrying-capacity in one year alone, showed a profit. On most farms, however, interpretation of the trials must take cognizance of: (i) Cumulative effect—pasture-improvement; (ii) mineral content—quality; (iii) permanent pasture—the avoidance of the high cost of pasture renewal; (iv) out-of-season grass.

(2) WOOL RESEARCH.

During the year under review Mr. D. J. Sidey has been absent in England and Scotland studying wool-research methods and inquiring into manufacturers' demands. Mr. Sidey has prepared a detailed report of his investigations, which has been submitted to the Council of Scientific and Industrial Research and is to be printed.

Consequent on Mr. Sidey's absence, there has not been much progress in this branch of research. However, the breeding trials have been continued, and promise very interesting results. The weighing of the fleeces from our stud flocks has been continued, and the results serve to stress the need for continuing this work on a wider scale. There is no doubt but that very considerable benefit would accrue to the sheep-breeding industry if some form of wool-testing were commenced in this country.

(3) PASTURE MANURIAL TRIALS.

During the year pasture manurial trials comparing the effects of different times of applications upon the response to manures have been continued as before.

(4) FARM-IMPLEMENT RESEARCH.

Last season a number of grain-drills were obtained from the manufacturers and a preliminary trial of these made. Results indicate that there is considerable room for improvement in even the best of these implements, and the information gained will form a useful starting-point when the improvement is seriously undertaken by the makers.

(5) ENGINEERING DEPARTMENT.

Some of the greatest difficulties in civil engineering work arise from a lack of knowledge of that important material, soil. The safety of building-foundations, the pressures on retaining-walls and tunnel-linings, and the condition of lands for drainage or irrigation are but a few of the questions involved, and it was with these in view that some work was commenced in vacation period by the Engineering Department. Owing, however, to lack of time, little has been accomplished beyond the collection of literature and an attempt at gaining the necessary technique. Classification is being carried out at the Canterbury Agricultural College, while the engineering features will be tested at the School of Engineering, Canterbury University College. Analyses made by the Bonyon hydrometer method show that, with certain precautions, fast and consistent work is possible, particularly in the colloid fraction.

(6) CHEMISTRY DEPARTMENT.

(a) *Iodine Research on Sheep*.—In connection with work being carried out by Mr. Scott on the treatment of sheep and lambs with potassium iodide a number of analyses were carried out during August, 1930, on the iodine content of blood, and thyroid samples of treated and control sheep.

(b) *Investigation of the Mineral Content of Pastures in Canterbury*.—This work may be divided up under two headings—

(1) Pure strains of grasses and clovers: Samples from a number of pure strains of clovers, rye-grass, cocksfoot, Chewings fescue, and brown-top have been collected over a twelve-monthly period. Analyses of the mineral content to show the species variation and seasonal variation have yet to be carried out.

(2) The effect of different manurial treatments on the botanical composition and mineral content of natural pasture in Canterbury: Eighteen different manurial treatments have been selected for investigations. A considerable amount of analytical work has been done, and it is hoped very shortly to be able to publish some of the results obtained. The analyses already carried out indicate that it is not only advisable, but also essential, that under Canterbury conditions the use of a lick containing lime and phosphat—e.g., bone-meal or steamed bone-flour with salt—should be used for stock.