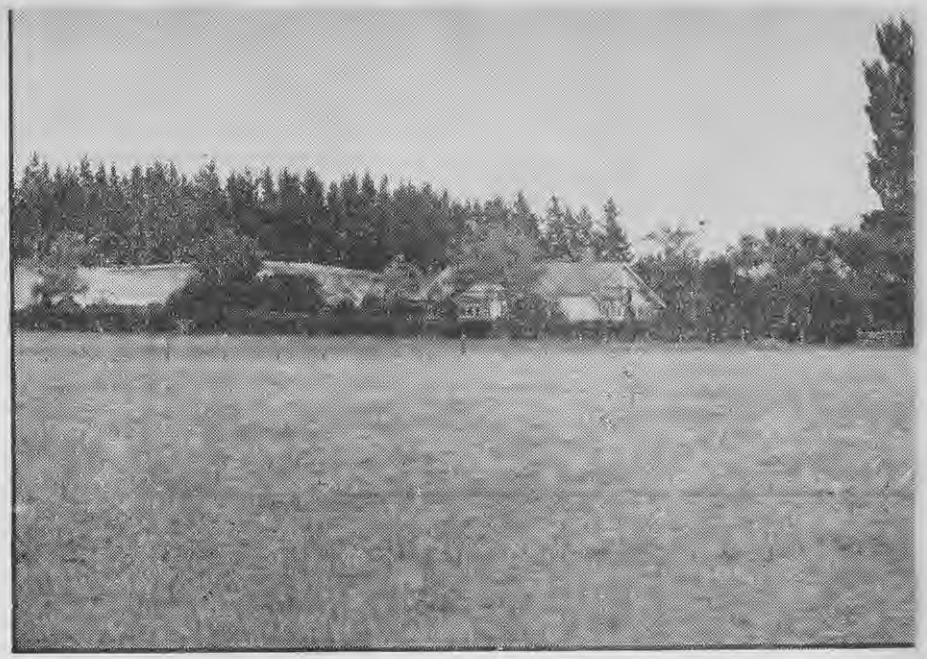
Restoring Canterbury Soil Fertility Through Pastures

WHAT can be achieved by good management methods to restore soils in which the fertility has been drained by heavy cropping is described in this paper by E. G. Smith, Fields Instructor, Department of Agriculture, Rangiora, which was read at the 1948 conference of the New Zealand Grassland Association. The paper describes how, in a comparatively-short period, the owner of a 500-acre property in North Canterbury succeeded in raising very substantially the productive capacity of the farm.

THROUGHOUT Canterbury there is an abundance of farms which, as a result of a protracted programme of cropping without due attention to a suitable rotation, have gradually become depleted of much of their original soil fertility. Under a continued system of incorrect management this depletion has inevitably reached the stage at which further cropping has become uneconomic, owing to reduced yields. When this regrettable stage has been reached something has had to be done—some alteration in the management has had to be made in an endeavour to rebuild the fertility of the soil.

When this point has been reached different farmers have adopted different methods of attaining the desired end. In a minority of cases when sufficient capital has been available to permit the owner to neglect temporarily the maintenance of income, the restoration of the soil to good heart has been accelerated. In most instances, however, restoration has been very gradual, as the farmer has been forced to maintain a reasonable annual income and at the same time return a small instalment to the "bank of soil fertility." A few farmers, through exceptional methods, have reached the desired end fairly rapidly without the use of capital which has not been produced on the farm—so with the property of 513 acres owned by Mr. E. Rands, of Springbank, North Canterbury. This farm, which is located 8 miles west of Rangiora, on the Oxford Road, has behind it a history of heavy cropping which, though very profitable in the early stages, led gradually to the depletion of soil fertility with a corresponding fall in crop yields. The climax was reached when the average wheat yield fell to the uneconomic figure of 19 bushels per acre, whereas in good seasons some years before yields had averaged 35-40 bushels.



[Green and Hahn Ltd. photo.

A cocksfoot-subterranean clover paddock near the homestead.

History of Property

The property, which was taken over as a mixed farm more than 29 years ago, was called upon to produce approximately 100 acres of wheat annually for 25 years. In one year 200 acres were sown to this crop. The severity of this cropping programme is appreciated when it is realised that the soils on the property are far from heavy, approximately 200 acres consisting of light, stony flats and 300 acres of fair to medium silt loam on shingle. But the farm may be taken as typical of a large area in the district, the unimproved value of the property being £8 per acre.

The 25 years of wheat growing constitute the soil-depletion period which was brought to a close by sadly-falling crop yields. The next period started 5 years ago, since when the farm has been in the process of changing over from a typical Canterbury light-land mixed farm to a property of high-producing pastures devoted chiefly to the production of wool and fat lambs. During the last 5 years no wheat has been produced, the only annual cash crops grown being barley, oats, peas, and lupins. Yet within this short term cash returns have almost doubled what they were at the end of the 25-year period and indications of returning fertility are to be seen everywhere.

In bringing about this state of affairs Mr. Rands has adopted very successful and interesting methods of management, and always they have been methods which have maintained a working income—methods, in fact, which could be used by the average farmer under similar soil and climatic conditions. It is with the period of fertility restoration which this paper will deal chiefly, but before doing so, it may be of interest to give a brief account of the history of the property as a background to the present management.

Part of Big Station

Originally the property was part of "Springbank," a station of 23,000 acres. It was taken up in 1851 by Mr. W. Kaye and sold in 1853 to Mr. Robert Chapman. In 1882 Mr. Chapman divided the station among his sons, but it was not until 1912 that the present state of subdivision was brought into being. In 1919 the late Mr. Rands (Mr. E. Rands's father) purchased the property, which he farmed until his retirement, when his son took over the management. With the exception of two paddocks, one of which had been cropped and one sown down with danthonia, the farm at that time was covered with tussocks and matagouri. There were several extensive areas of manuka and blackberry. The 513 acres was divided into 7 paddocks with wire fences and manuka hurdles. There were several small clumps of trees. The buildings comprised a 4-roomed cottage and thatched stable on the eastern boundary. A water race followed a devious course through the property.

The late Mr. Rands soon had a man at work with a 6-horse team and a plough. Most of his own time during the early period of possession was devoted to the erection of his homestead, farm buildings, and yards and the planting of shelter belts. The farmyard and buildings were placed well behind the homestead and shut off from view with shrubs and hedges. The house was thus removed from the main line of traffic and its location and pleasing appearance are a tribute to the late Mr. Rands's foresight.

Subdivision

The farm was then subdivided into 21 paddocks, which involved the erection of more than 10 miles of fencing and the provision of 60 14ft. gateways. When the water race had been straightened and a new one formed water flowed through every paddock on the farm.

During the period it was being worked as a mixed farm the property

The photographs in this article were taken on Mr. Rands's property after a prolonged spell of hot, dry weather and unfortunately do not do justice to the condition of the farm.