

addition has sometimes been justified. The botanical analysis of the hay of the limed plot at Cockle Park showed that in the third season after the application, although the percentage of poorer grasses (*Agrostis* sp.) had been much decreased and the percentage of good grasses—crested dogstail and cocksfoot—much increased, there was no increase in the white clover; whereas on the phosphate plots there was considerable increase in the white clover.

The carrying-capacity of the untreated Cockle Park land for the twenty weeks' grazing season was 2 sheep to the acre, which was increased to 4 sheep on the slagged and 2.7 on the superphosphate-dressed plots. The average live-weight gain per head of the sheep on the unmanured plot was 14 lb. for the first and 24 lb. for the second season's grazing respectively, lasting from sixteen to twenty weeks.

Previous experiments in New Zealand on the improvement of pasture on the lines of the Cockle Park experiments have been attempted at Moumahaki and Ruakura Experimental Farms (see Department's Annual Report, 1909, p. 390, and *Journal*, July, 1914, p. 39). These pastures, whatever it may have been originally, was hardly what could be called poor sheep-pasture, the unmanured plot at the former station carrying  $5\frac{1}{2}$  and at the latter over 10 sheep on the average, and the top-dressing only increasing the carrying-capacity by about 1 sheep.

Mr. A. H. Russell (now Brigadier-General Sir A. H. Russell), at Tunanui, Hawke's Bay, in 1910 increased the carrying-capacity of 130 acres from 1.24 sheep to 2.07 sheep to the acre by manuring with 2 cwt. superphosphate and 2 cwt. bone-and-blood manure per acre, increasing at the same time the percentage of lambs and the quality of the wool, at a cost of £1 10s. per acre for fertilizer and distribution expenses (*Journal*, p. 352, 15/4/11).

Mr. G. L. Marshall, of Greenbank, Marton, in 1910 top-dressed a 5-acre paddock with a little under 1 cwt. per acre of basic slag, and estimated the carrying-capacity of the slagged paddock as 5.32 sheep, as against 2.98 sheep on an untreated paddock of same size (*Journal*, April, 1911, p. 218).

It will be seen in the foregoing experiments that these lands, judged by their carrying-capacity, are all of much greater value than the Wallaceville land, and that even the poor Cockle Park land will carry during its comparatively short grazing season nearly half a sheep more on the untreated pasture than that of Wallaceville, which in a favourable season will carry only 1.6 sheep per acre. On the limestone-dressed paddock at a cost of 15s., and on the limestone and phosphate paddock at a cost of £1 19s. 6d., per acre for fertilizers, however, since 1st November last nearly 5 sheep per acre have been carried, with every prospect of this capacity being maintained for another month or so.

#### THE WALLACEVILLE EXPERIMENTS.

The experiments here recorded embody all that has resulted from an extensive experimental scheme of pasture-improvement which, based on the Cockle Park experiments,\* was drawn up by the writer in 1914 and submitted to the Board of Agriculture. The Board

\* See "Influence of Manures on Mutton," *Jour. Board of Agriculture of England*, Vol. vi, No. 3, Dec., 1899; and Vol. vii, No. 3, 1900; and Supplement to same, Vol. xvii, No. 10, Jan., 1911. All articles by Dr. Somerville, Professor of Rural Economy, Oxford University.