

has been greatly improved by top-dressing with lime and fertilisers and by the use of improved and more persistent strains of grasses and clovers.

WHEAT MANURIAL TRIALS

Consequently the type of pasture ploughed under today is, on the average, greatly superior to that ploughed under 15 years ago, and the phosphate content of the soils is also higher. There is not the same need for applying fertiliser with wheat, which is a crop that does not demand as high a level of available phosphorus compounds in the soil as grass and, notably, brassica crops (swedes, rape, etc.). As an insurance against a possible deficiency, however, the use of 1cwt. an acre of a phosphatic fertiliser with wheat is still recommended. The cost of this material is about 4s. an acre and is met by an increase of much less than a bushel of wheat an acre.



Two adjacent plots in a standard wheat manurial trial.

COMPARISON OF SUPERPHOSPHATE WITH SERPENTINE SUPERPHOSPHATE ON WHEAT

The comparison in all cases is between 1cwt. an acre of each fertiliser, which means that there is about one third more phosphorus applied an acre in the superphosphate treatment than in the serpentine superphosphate treatment. Typical analyses of superphosphate give a total phosphoric acid content of 21 to 23 per cent. and of serpentine superphosphate of 15 to 17 per cent. The first question that arises is, therefore, whether this smaller amount of phosphoric acid would cause a significant reduction in yield if it was applied as superphosphate. An analysis is therefore given of the results of sixteen of the trials concerned where one of the treatments was the "minimum amount of superphosphate that the drill would sow." In most cases this is about 90lb. an acre, in which case about one quarter less of the phosphoric acid is applied than is

applied when 1cwt. of superphosphate is sown.

Details of the trials concerned are given in the table below. Where the "superphosphate minimum" treatment was included the trials are marked with an asterisk.

Consideration of the 20 trials shows that:—

- (a) The mean response to 1cwt. of fertiliser an acre (superphosphate or serpentine superphosphate) is 1.2 bushels an acre.
- (b) The mean difference in favour of superphosphate in comparison with serpentine superphosphate is 0.4 bushels an acre.

This mean difference in favour of superphosphate is, however, not significant, whereas the mean response to fertiliser is just significant. This means that, although on the average superphosphate shows a slight superiority, this difference in individual trials is not consistent. In fact, the comparison in such cases shows a range from 2.07 bushels an acre in favour of superphos-

There remains the possibility that the varieties now used in the trials (mainly Cross 7) are not as responsive to fertilisers as were the varieties used several years ago. To test this assumption three trials were laid down last year using the varieties Cross 7 and Solid Straw Tuscan. In no case was there any significant difference between the response of the two varieties to fertiliser.

In view of the present relatively low responses to superphosphate, it is necessary to view with caution apparently small differences in effect on yields between superphosphate and serpentine superphosphate, and this must be borne in mind when considering the following survey.



Location of wheat manurial trials is marked with a dot.

[Map by Lands and Survey Department, Wellington.]

Experiment Number.	Name of farmer co-operating.	Date trial sown.
* 16/3/1324	H. G. Chamberlain, Leeston	7/5/41
* 16/3/1325	E. G. Wright, Dunsandel	13/5/41
* 16/3/1371	M. E. Jenkins, Courtenay	30/6/42
* 16/3/1329	F. Dawson, Fernside	30/5/41
* 16/3/1367	C. G. Sutherland, Rangiora, Springbank	8/6/42
* 16/3/1368	W. J. McMillan, Rangiora	11/6/42
* 16/3/1403	C. E. Brown, Oxford	19/6/43
* 16/3/1331	J. F. Langley, Somerton	9/6/41
* 16/3/1332	McDonald and Rooney, Lyndhurst	4/6/41
* 16/3/1361	W. K. Wilson, Methven	12/6/42
* 16/3/1363	Mt. Harding Estate, Methven	29/6/42
16/3/1441	W. Forsythe, Ealing	9/6/45
* 16/3/1360	F. R. Clarke, Waitawa	5/6/42
* 16/3/1365	A. D. Bishop, St. Andrews	18/6/42
* 16/3/1366	Gleniti Golf Course, Timaru	8/6/42
* 16/3/1402	R. G. Wallace, Geraldine	8/6/42
* 16/3/1405	A. D. Bishop, Lyalldale	4/8/43
16/4/980	G. Stevenson, Weston	27/5/40
16/4/1039	G. Stevenson, Weston	26/5/40
16/4/1165	R. G. Paton, Pukeuri	23/8/45