

Results from trials extending over nine years indicate—

- (1) That treatment A shows to greater advantage in the seasons when superphosphate is applied. This indicates the desirability of annual applications of superphosphate.
- (2) That the initial benefit derived from a heavy initial application of lime in treatment C has declined by the fourth season, after which production is equal to or only slightly better than that of treatment B, which has had no lime.
- (3) That the heavy application of 2 cwt. of superphosphate annually in treatments B and C is not as efficiently utilized as the 1 cwt. of superphosphate every other year in treatment A, because of the absence of lime (B) or the decline in the lime status (C)
- (4) That the $\frac{1}{2}$ cwt. of potash in treatment D has retained its superiority throughout but production from treatment A in the sixth year ("superphosphate" year) is only slightly below that of Treatment D.

Treatment A appears to provide almost adequate supplies of lime and superphosphate to maintain high production on this class of land. The application is equivalent to $2\frac{1}{2}$ cwt. of lime and $\frac{1}{2}$ cwt. of superphosphate per annum. However, the high production was not reached until 10 cwt. of lime and 4 cwt. of superphosphate had been applied (fourth season). One may conclude that on light plains land the fertilizer treatment for subterranean clover pastures should start off with 10 cwt. of lime and 2 cwt. of superphosphate and, once a satisfactory cover has been obtained, that the maintenance of the lime and superphosphate status of the soil can be secured by an annual application of $2\frac{1}{2}$ cwt. of lime and $\frac{1}{2}$ cwt. of superphosphate, or its equivalent. The other treatments used in the investigation, though capable of increasing production, are considerably more costly than treatment A. This treatment applied to subterranean clover pastures on light plains land is capable of raising the carrying-capacity to approximately two ewes per acre.

ENTOMOLOGICAL INVESTIGATIONS

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Wheat Variety Trials for Hessian Fly and Argentina Stem Weevil Studies

Hessian-fly infestation was more severe than normal, due probably to the later sowing date leading to the most susceptible stage of the plants coinciding with the emergence, during October and November, of the over-wintering fly. The degree of infestation was very much higher at Hororata than at Lincoln, but the varieties retained the same relative positions in both areas. The susceptible varieties were Hunters, Dreadnought, and Cross 7, and the resistant varieties were Tainui, 78, 01, Tuscan, and 140, 014.

Stem-weevil infestation was more severe at Lincoln than at Hororata, but on the whole the varieties retained the same relative positions in both areas. Tuscan was susceptible and Dreadnought was resistant in both areas, whether from the point of view of (a) stems killed, (b) tillers killed, or (c) stems bored but not killed. An indication of the susceptibility or resistance of the other varieties was shown, but the position was less clearly defined. The results tended to show that the presence of weevil strongly affected that of Hessian, particularly in areas where infestation was not excessively heavy. In varieties where stem-weevil infestation was greatest, Hessian-fly infestation was least, and *vice versa*.

An analysis of the results obtained for Cross 7, Tuscan, Hunters, and Dreadnought over a period of years and in widely separated districts—viz., Lincoln, Hororata, Highbank, and Ngapara—shows that the results have been consistent from year to year, irrespective of the district in which the varieties were grown.