

The second trial drilled in spring (18/8/59) at Orari followed a swede crop. The soil type was a Waimakariri sandy loam and the area gave a high phosphate soil test, the phosphate figure being three times that of the autumn-sown trial. Rates of seeding and manurial treatments were the same as for the autumn-sown trial (1, 1½, 2, 2½, and 3 bushels per acre with and without 1 cwt of superphosphate).

Despite rather dry conditions after drilling the trial had made excellent growth by 23/9/59, plants being 3 to 4 in. high. The plants establishing per 10 ft of row were counted at this inspection (see Table 2). There were marked differences between the sowing rates, 1 bushel appearing to be too thin, 3 bushels too dense along the drills, and 2 bushels about the right density. At that stage 1 cwt of superphosphate was showing no apparent effect compared with no manure.

However, by mid October there were very marked differences between both rates of seeding and 1 cwt of superphosphate compared with no manure. The 1 and 1½ bushel seedings lacked density and no-manure plots were strikingly short, yellow, and extremely unthrifty. Because of moderately severe cornbind and Californian thistle infestation the trial was sprayed with 2 pints of MCPA weed-killer in mid October and a good kill of weeds was obtained.

When the tillers were counted on 4/11/59 (see Table 2) the trial had made excellent growth after heavy rain in mid October and differences between both rates of seeding and manurial treatments, though quite striking, were not nearly as marked as they had been in October. Nevertheless, plants sown without manure were about 3 in. shorter, much less flaggy, and a paler green than those drilled with 1 cwt of superphosphate, and the 1 and 1½ bushel sowings, despite good tillering, still lacked density.

By 26 January the plots that received superphosphate were slightly taller, denser, and earlier maturing than those drilled without manure, while the 1 and 1½ bushel rates were less dense and later maturing than the heavier rates, which appeared very similar. The heads per 10 ft of row were counted on 26 January (see Table 2); in all treatments the heads varied markedly in size. Heavy rain in December had favoured mildew attack and there was some head discoloration. There was also a little

damage caused by cutworms and Argentine stem weevil.

On 17 February the trial was harvested and gave consistently large yield increases with superphosphate application and with the heavier rates of seeding.

The difference in yield between 1 bushel per acre sown without manure and 2½ bushels per acre sown with 1 cwt of superphosphate was 29 bushels per acre.

Conclusions

The rate-of-seeding trial for autumn-sown wheat confirmed results of (Continued at bottom of page 129)



Aotea autumn sown at 1 bushel (left) and 3 bushels (right).

Trials to Continue

TRIALS similar to those described in this article are, with some modifications, being continued this year. Some treatments which have been tried and confirmed over a number of years will be discarded and new treatments which will attempt to solve other problems of wheat growing will be included in the new trials.

In 1960-61 it is intended to:

1. Compare spring-sown Aotea and Arawa at the same seeding rates as last year (but all sown with 1 cwt of superphosphate per acre).

2. Compare the effects of grazing and no grazing on yields of Aotea and Arawa in an autumn-sown rate-of-seeding trial. (To be continued for 3 to 5 years.)

3. Compare the yields of spring-sown Aotea and Arawa (at the same rates of seeding as in 1959-60) when sown with no manure and 1, 2, and 3 cwt of superphosphate per acre.

TABLE 1—RESULTS IN RATE-OF-SEEDING TRIAL WITH AUTUMN-SOWN WHEAT

Seeding rate per acre (12/6/59)	Germinated plants per 10 ft of row (5/8/59)	No. of tillers per plant (8/10/59)	No. of heads per 10 ft of row (26/1/60)	Yields per acre (8/2/60) bushels
60 lb	76	4.2	246	84
90	116	3.7	295	88
120	132	3.4	298	89
150	212	2.5	317	89
180	229	2.2	321	90
No manure	157	3.2	287	87
1 cwt super per acre	149	3.3	304	89

Statistical significances: The trends shown in the three categories "Germinated plants", "Tillers per plant", and "No. of heads" are supported by statistical significance between treatments in most cases. The differences in germination, number of heads, and yields due to superphosphate are also significant. In the yields from seeding rates, however, the only significant difference is that the 84 bushels from the 60 lb seeding rate is lower than any other.

TABLE 2—RESULTS IN RATE-OF-SEEDING TRIAL WITH SPRING-SOWN WHEAT

Seeding rate per acre (18/8/59)	Germinated plants per 10 ft of row (23/9/59)	No. of tillers per plant (4/11/59)	No. of heads per 10 ft of row (26/1/60)	Yields per acre (17/2/60) bushels
60 lb	66	5.0	236	62
90	98	4.3	264	70
120	123	3.7	265	77
150	167	3.0	307	81
180	191	2.6	300	81
No manure	129	3.1	258	69
1 cwt super per acre	128	4.0	291	79

Statistical significances: The trends shown in the three categories "Germinated plants", "Tillers per plant", and "No. of heads" are supported by statistical significance between treatments in most cases. The differences in tillers, number of heads, and yields due to superphosphate are all significant. In yields from seeding rates, 60 lb is lower than 90 lb, which in turn is lower than 120, 150, and 180 lb. (The last three do not differ significantly.)