

1935–36 are summarized in the following table, which shows the months in which the water content was raised to 60 per cent. saturation, and the corresponding yields of grain :—

Month.	Yield of Grain (in Ounces).	Month.	Yield of Grain (in Ounces).
1935.		December	1·29
September	1·87	1936.	
October	4·18	January	2·50
November	1·01	February	1·90

This indicates very clearly that sufficient soil water in October is more important than in any other month of the year. This corresponds with the period in which the wheat-stalks are lengthening. Water at that period allows many of the tillers to grow and produce heads. There is apparently another month in which an adequate water-supply is important, though much less important than October—namely, January, when the grains are filling. The heads produced by the October moisture are thus enabled to produce large grains, and consequently a high yield. It thus appears that the highest grain-yields should be obtained when there are useful rains in October and in January, and that drought in the other months is relatively unimportant.

This investigation is being undertaken in the hope of correlating these findings with soil-moisture in the field.

(3) For the third season, trials have been made of the effect on yield of feeding off wheat by sheep. A very good trial was made this year on a College paddock, four areas of about $\frac{1}{10}$ acre each being fed off, and four similar areas being left unfed. There was no difference in the yield. Thus in two seasons there has been no difference in yield, and, in one, feeding off depressed yield by about 4 bushels per acre. This is contrary to the statement often made, that feeding off increases tillering and therefore increases yield. It would be truer to say that wheat should never be fed off unless (a) the feed is needed for sheep, or (b) it is feared that the crop will go down.

(4) *Wheat-pickling*.—A line of Hunters free from smut was treated with various pickles. A field trial of four replicated half-drill strips of each pickling was sown, and the yields are given below. The yields are the average of the four replicates.

Treatment.	Yields in Pounds per Acre.	Treatment.	Yields in Pounds per Acre.
Ceresan	23·00	Formalin	23·00
Agrosan	24·25	Bluestone	22·25
Copper carbonate ..	23·50	Untreated	22·00

There are no significant differences, but there is a tendency to increased yields from the organic-mercury dusts. This is in accordance with the results of previous seasons.

(5) *Thickness of Sowing*.—In the course of his work on the foot-rots of wheat, Mr. I. D. Blair (whose results are published in the *New Zealand Journal of Agriculture*, March, 1936) sowed wheats at different thicknesses with the following results :—

Rate of Seeding (Pounds per Acre).	Yield in Bushels per Acre.	Rate of Seeding (Pounds per Acre).	Yield in Bushels per Acre.
90	37·16	150	37·60
120	37·06	150	40·70

This is in accord with the results of Mr. A. W. Hudson’s work, showing the benefits of thicker sowing with our present commercial drills.

2. *Oats*.—The cross-breds Algerians by Gartons and Algerians by Duns have been abandoned. Selections in Algerians are showing some promise. Eighteen selections were sown in field trials, and of these six have been retained. Their performance was as follows :—

Selection.	Difference from Control.	Selection.	Difference from Control.
	Per Cent.		Per Cent.
Control (College B 49)	..	1/10	+11·0
5/6	+16·3	1/12	+ 3·0
11/19	+15·0	3/6	— 2·8
12/19	+ 8·0		

These have been selected because of high yield, low percentage of husk, and suitability of straw. Fifteen acres of these strains have been sown for final selection.