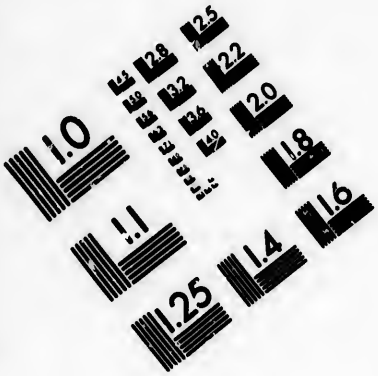

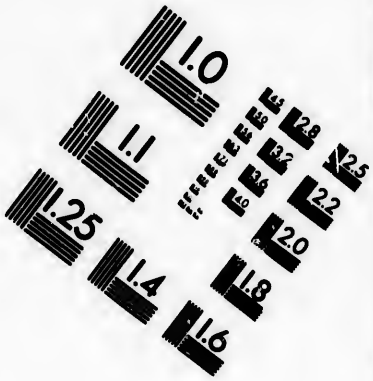

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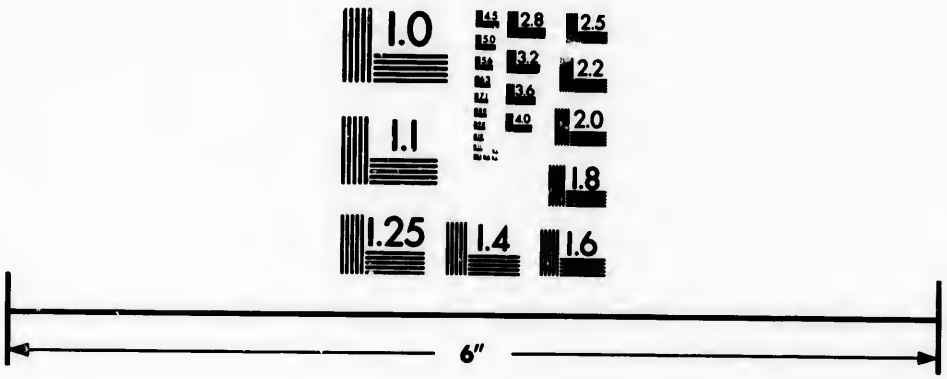

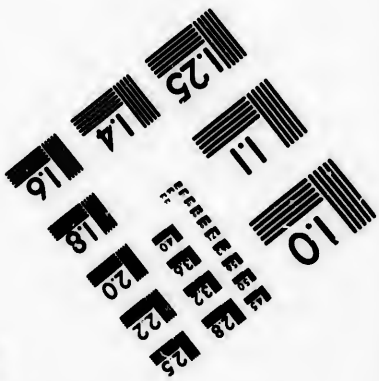

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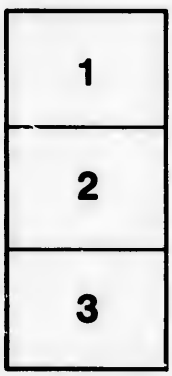

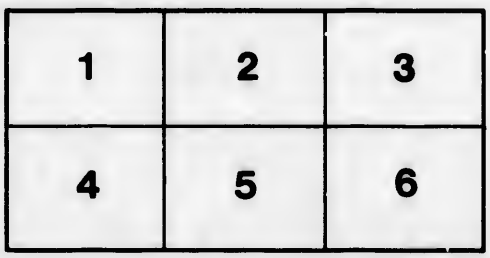

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CENTRAL EXPERIMENTAL FARM,

:o:

DEPARTMENT OF AGRICULTURE,

OTTAWA, - - - CANADA.

:o:

BULLETIN No. 8.

:o:

Results of Early and Late Seeding of Barley, Oats and Spring Wheat.

:o:

JANUARY 1891.

CENTRAL EXPERIMENTAL FARM.

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DEPARTMENT OF AGRICULTURE,

OTTAWA, - - - - - CANADA.

BULLETIN No. 8.

Results of Early and Late Seeding of Barley, Oats and Spring Wheat.

—:o:—

By Wm. SAUNDERS, Director Experimental Farms.

—:o:—

The experience gained at the Central Experimental Farm during the past season on this subject, points to the great importance of early seeding. So vital a bearing does this appear to have on the profits of agriculture, that the results are deemed of sufficient importance to justify their being brought under the notice of the farmers of the Dominion, in a special bulletin with the least possible delay, so that opportunity might be given for discussing the subject at the winter meetings of Farmers' Institutes and Conventions, Farmers' Clubs and Agricultural Circles, with the hope that farmers will undertake tests for themselves in this particular line of work, so that further experience may be gained under those varying conditions of soil and climate, which obtain in different sections of the several Provinces. It is generally conceded that the farmer who makes a practice of getting his seed into the ground at the earliest opportunity, after the land is in suitable condition to receive it, realizes, as a rule, the best returns, but to

what extent the advantage is on his side, has not heretofore been submitted to careful test in Canada.

EXPERIMENTS UNDERTAKEN.

Thirty-six plots of one-tenth of an acre each, were devoted to a test of the relative advantages of early, medium and late sowing of barley, oats and spring wheat, two varieties of each grain being sown. It was decided to sow one of these ranges of six plots, every week until all were seeded, making altogether six sowings. The varieties of grain chosen were as follows:—Barley, *Prize Prolific*, and *Danish Chevalier* (both two-rowed sorts); Oats, *Prize Cluster* and *Early Race Horse*; Spring Wheat, *Red Fife* and *Ladoga*.

The soil selected was as uniform as could be found; it was a piece of light sandy loam, which when the Experimental Farm was purchased in 1886, was in sod. A crop of hay was taken off in 1887, and finding that the land was much exhausted, a coating of stable manure, about twenty tons to the acre, was applied to it early in the autumn and shortly after the manure was ploughed under with the sod. In the spring of 1888 it was again ploughed, then harrowed and sown with experimental plots of wheat and oats. It was ploughed again in the autumn, and in the spring of 1889 planted with Indian Corn in drills, which was cut in September for ensilage. Subsequently the land was ploughed again and early in the spring of 1890, it received a uniform dressing of unleached wood ashes about 150 bushels to the acre.

The first twelve of the 36 plots were cultivated with a disc harrow, and six of them harrowed with a common iron harrow, on the 21st of April, 1890, and sown on the 22nd; the other six plots in this series were harrowed and sown on the 29th. The next twelve plots were similarly cultivated, six of them were harrowed on the 5th of May and were seeded on the 6th, while the other six plots in this range were harrowed and sown on the 13th. The remaining twelve plots were cultivated with the disc harrow and six of them harrowed with the iron harrow, on the 19th and sown on the 20th, the last six plots of the series being well harrowed on the 27th of May immediately before sowing. From these particulars it will be seen that the ground was well stirred before each sowing so as to destroy all young weeds which might have started. By the treatment given, the later plots may be said to have had at the start

some advantage over those earlier seeded as far as weeds were concerned; but before the grain matured the weeds made greater headway on the later sown plots.

At the first sowing the *Race Horse* oats was omitted and a new spring wheat sown in its place, known as *Carter's Cross bred* I or *Anglo-Canadian*. This was done for the reason that these plots afforded the best opportunity at command for making a fair test of this new variety alongside of the *Red Fife* and *Ladoga*, so that their relative earliness and fertility might be compared. Otherwise the experiments were carried out as planned. The following table gives the results :—

	Sown April 22nd. Yield per acre.		Sown April 29th. Yield per acre.		Sown May 6th. Yield per acre.		Sown May 13th. Yield per acre.		Sown May 21st Yield per acre.		Sown May 28th, Yield per acre.	
	Bush.	Lbs.	Bush.	Lbs.	Bush.	Lbs.	Bush.	Lbs.	Bush.	Lbs.	Bush.	Lbs.
BARLEY.												
Prize Prolific..	40	30	24	38	16	22	14	03	10	15	11	02
Danish Chevalier	33	26	22	14	19	28	15	10	10	30	9	28
OATS.												
Prize Cluster.....	37	02	33	23	30	20	27	17	20	10	17	22
Early Race Horse	—	—	35	05	31	26	28	13	18	18	19	04
SPRING WHEAT.												
Red Fife.....	11	00	9	00	8	15	4	20	3	00	2	35
Ladoga.....	10	45	9	15	8	00	3	55	2	50	2	30
Anglo-Canadian..	5	50										

These experiments were carried on with much care so as to reach results as correct as possible, and while it must be admitted that such tests will need to be repeated many times in order to obtain averages which may neutralize the variations brought about in crops by varying seasons, there is nevertheless such a degree of uniformity in the descending scale, week after week, as to carry with it convincing proof of the heavy losses which are almost sure to occur where late seeding is practised. If the results which have been given can be taken as any guide whatever for the future, this subject deserves the most earnest attention of every farmer. The loss on *Prize Prolific* barley by a delay in sowing of one week is nearly sixteen

bushels per acre, and on *Danish Chevalier* a little more than eleven bushels, while a delay of two weeks shows an average loss in the two experiments of more than half the crop, or about eighteen bushels per acre. In the "Statistics of Crops in Ontario" for 1890 recently published by the Bureau of Industries, the area under barley is estimated at 701,326 acres and should one half the average loss which has been shown to have occurred in the experiments at Ottawa, be taken as the basis for an estimate, it would appear that the farmers of Ontario may lose by a delay of one week in the time of seeding over 2½ millions of dollars on the barley crop alone, and by a delay of two weeks, taking the average results of the two experiments, more than 3¾ millions, estimating the value of barley at 50 cents per bushel.

The loss incurred by similar delay in the crop of spring wheat has proved proportionately less, being about one-sixth of the whole where seeding has been delayed one week, and one-fourth where it has been deferred for two weeks, while a three weeks delay shows a loss of considerably more than one-half. Spring wheat, however, owing to an unfavourable season, has given an unusually light crop, and how far these results might be modified under average conditions, can only be determined by further tests. Reckoning the money value of the loss on a similar basis to that of the barley, —that is one half of the actual loss in the average of the two experiments, taking spring wheat at 90 cents per bushel, we find that a delay of one week in sowing shows a possible shrinkage in the value of the crop of Ontario of $473,879, and a delay of two weeks $744,669.

The oat crop appears to be less influenced by delay in seeding than either barley or spring wheat. In the case of the "*Prize Cluster*" it is a falling off of about three bushels per acre for the first week, but with the delay of two weeks it is a little over six and a half bushels, but the oat crop is so very large that every bushel of loss per acre in Ontario alone, taking oats at 40 cents per bushel, is equal to $752,946.

In the following tables are given some further particulars of the growth of the several varieties which may prove of interest. They include dates of sowing, when up, when headed, dates of ripening, with the number of days which elapsed between dates of sowing and ripening :—

BARLEY.	Sown.	Up.	Headed.	Ripe.	No. of days maturing
Prize Prolific, 1st sowing	April 22	May 9	July 6	Aug. 4	104
" " 2nd "	" 29	" 14	" 9	" 6	99
" " 3rd "	May 6	" 18	" 14	" 12	98
" " 4th "	" 13	" 22	" 16	" 17	96
" " 5th "	" 20	" 26	" 20	" 21	93
" " 6th "	" 27	June 3	" 25	" 24	89
Danish Chevalier, 1st sowing ..	April 22	May 6	" 6	" 4	104
" " 2nd " ..	" 29	" 14	" 9	" 7	98
" " 3rd " ..	May 6	" 18	" 14	" 12	98
" " 4th " ..	" 13	" 22	" 16	" 17	96
" " 5th " ..	" 20	" 26	" 20	" 21	93
" " 6th " ..	" 27	June 2	" 26	" 23	88
OATS.					
Prize Cluster, 1st sowing.....	April 22	May 10	" 4	July 30	99
" " 2nd "	" 29	" 16	" 11	Aug. 8	101
" " 3rd "	May 6	" 20	" 12	" 8	93
" " 4th "	" 13	" 24	" 13	" 11	90
" " 5th "	" 20	" 27	" 16	" 13	85
" " 6th "	" 27	June 3	" 21	" 16	81
Early Race Horse, 1st sowing..	April 29	May 16	" 9	" 8	101
" " 2nd " ..	May 6	" 20	" 13	" 9	94
" " 3rd " ..	" 13	" 24	" 13	" 11	90
" " 4th " ..	" 20	" 27	" 16	" 13	85
" " 5th " ..	" 27	June 3	" 21	" 16	81
WHEAT.					
Red Fife, 1st sowing.....	April 22	May 9	July 5	August 13	113
" 2nd "	" 29	" 15	" 9	" 19	112
" 3rd "	May 6	" 19	" 13	" 21	107
" 4th "	" 13	" 23	" 14	" 21	100
" 5th "	" 20	" 26	" 18	" 24	96
" 6th "	" 27	June 2	" 24	" 26	91
Ladoga, 1st sowing.....	April 22	May 9	" 4	" 7	107
" 2nd "	" 29	" 15	" 7	" 11	104
" 3rd "	May 6	" 19	" 9	" 11	97
" 4th "	" 3	" 23	" 13	" 13	92
" 5th "	" 20	" 26	" 17	" 17	89
" 6th "	" 27	June 2	" 24	" 21	86
Carter's cross-bred I, or Anglo-Canadian 1 sowing only....	April 12	May 9	July 8	" 13	113

These results show that the number of days required by the different varieties of grain, from the time of seeding to harvesting, decreases with the successive sowings with considerable regularity. It is evident that the later sown plots were hurried in all their different stages up to the period of ripening. It will also be seen that the *Ladoga* wheat has matured on an average in seven days less time than the *Red Fife*, and in the single comparative test with the *Anglo-Canadian* the *Ladoga* is six days earlier.

Notes were taken at two or three different times as the season advanced, and more or less rust was recorded in every instance on all the plots; the terms "slightly," "considerably" and "badly rusted" being used to indicate increasing degrees of rustiness. Information was also gathered regarding the character of growth of each variety and the height of each sort at the time of harvesting. These details are presented in the accompanying table, where the condition of the grain as to rustiness is given from the notes taken just before harvesting.

DATES OF SOWING.	BARLEY.						OATS.		
	PRIZE PROLIFIC.			DANISH CHEVALIER.			PRIZE CLUSTER.		
	Condition as to rustiness.	Height.	Character of growth.	Condition as to rustiness.	Height.	Character of growth.	Condition as to rustiness.	Height.	Character of growth.
APRIL 22	Leaves badly. Stems considerably.	3 ft. to 3 ft. 6 in.	Strong and even.	Leaves badly. Stems considerably.	3 ft. to 3 ft. 6 in.	Strong and even.	Leaves considerably. Stems slightly.	4 ft.	Strong and very even.
APRIL 29	Leaves badly. Stems considerably.	2 ft. 6 in. to 3 ft.	Fairly even, a little patchy stands well.	Leaves badly. Stems considerably.	3 ft.	Fairly even, stands well.	Leaves considerably. Stems badly. Heads slightly.	3 ft. 9 in. to 4 ft.	Strong but patchy, badly lodged.
MAY 6	Leaves badly. Stems slightly to considerably.	2 ft. to 3 ft.	Medium to weak stands well.	Leaves badly. Stems considerably.	2 ft. to 3 ft.	Medium to weak. stands well.	Leaves considerably. Stems badly. Heads slightly.	3 ft. to 4 ft.	Strong and even, slightly broken.
MAY 13	Leaves badly. Stems considerably.	2 ft. to 3 ft.	Medium but patchy stands well.	Leaves badly. Stems considerably.	2 ft. to 3 ft.	Medium but patchy, stands well.	Leaves considerably. Stems and heads badly.	3 ft. to 3 ft. 9 in.	Strong, fairly even, considerably broken.
MAY 20	Leaves and stems considerably.	1 ft. 6 in. to 2 ft. 9 in.	Weak and very thin, many heads broken.	Leaves badly. Stems considerably.	1 ft. 6 in. to 2 ft. 9 in.	Medium to weak, patchy, considerably broken.	Leaves considerably. Stems badly. Heads considerably.	3 ft. to 3 ft. 9 in.	Strong, fairly even, badly lodged.
MAY 27	Leaves and stems considerably.	1 ft. 6 in. to 2 ft. 6 in.	Weak and very thin.	Leaves and stems considerably.	1 ft. 6 in. to 2 ft.	Weak, very patchy, stands well.	Leaves, stems and heads badly.	2 ft. 6 in. to 3 ft.	Uneven, one half badly lodged.

DATES OF SOWING.	OATS.			SPRING WHEAT.					
	EARLY RACE-HORSE.			RED FIFE.			LADOGA.		
	Condition as to rustiness.	Height.	Character of growth.	Condition as to rustiness.	Height.	Character of growth.	Condition as to rustiness.	Height.	Character of growth.
April 22				Leaves badly Stems considerably. Heads badly.	3 ft. to 3 ft. 9 in.	Very uneven and patchy.	Leaves and stems badly. Heads considerably.	3 ft. to 3 ft. 9 in.	Strong, stands well.
April 29	Leaves and stems badly. Heads slightly.	3 ft. 9 in.	Strong and even, badly lodged.	Leaves and stems considerably. Heads badly.	3 ft. to 3 ft. 9 in.	Uneven and patchy.	Leaves and stems badly. Heads considerably.	3 ft. to 3 ft. 9 in.	Medium, rather patchy slightly broken.
May 6	Leaves considerably. Stems badly. Heads considerably.	3 ft. to 4 ft.	Strong and even, broken in places.	Leaves badly. Stems considerably. Heads badly.	2 ft. 6 in. to 3 ft. 6 in.	Weak, considerably broken.	Leaves, stems and heads badly.	3 ft. to 3 ft. 6 in.	Weak and uneven, slightly broken.
May 13	Leaves considerably. Stems and heads badly.	2 ft. to 3 ft. 3 in,	Medium but patchy, considerably broken.	Leaves, stems and heads badly.	2 ft. to 3 ft. 3 in.	Very weak, considerably broken.	Leaves and stems badly. Heads slightly.	2 ft. 6 in. to 3 ft.	Very weak and patchy, slightly broken,
May 20	Leaves considerably. Stems and heads badly.	3 ft. to 3 ft. 9 in.	Strong but patchy, badly lodged.	Leaves considerably. Stems and heads badly.	2 ft. 6 in. to 3 ft. 3 in.	Weak, considerably broken.	Leaves and stems badly. Heads considerably.	3 ft. to 3 ft. 3 in.	Weak and patchy.
May 27	Leaves considerably. Stems and heads badly.	2 ft. to 2 ft. 6 in.	Strong but uneven, badly lodged.	Leaves considerably. Stems and heads badly.	2 ft. to 2 ft. 9 in.	Weak, considerably broken.	Leaves, stems and heads badly.	2 ft. to 2 ft. 9 in.	Very weak, badly broken.

The single plot of *Anglo-Canadian* wheat had the leaves badly, stems considerably and heads slightly rusted; the growth was uneven and patchy and the height 3 feet 6 inches to 4 feet.

It will be seen that all the varieties experimented with suffered from rust, the wheat being injured most. It is proposed to continue this line of experimental work next year at all the Experimental Farms.