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Canada

DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

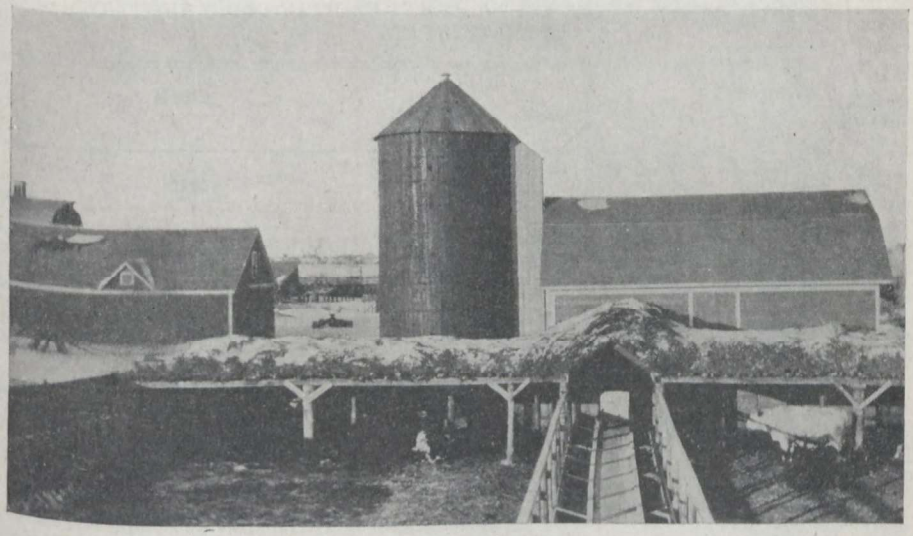
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL STATION
ROSTHERN, SASK.

INTERIM REPORT OF THE SUPERINTENDENT

W. A. MUNRO, B.A., B.S.A.,

FOR THE YEAR ENDING MARCH 31, 1921



Arrangement for winter feeding of cattle, showing silo, feed room, shelter, feed-chute and two corrals.

Printed by authority of the Hon. S. F. Tolmie, Minister of Agriculture, Ottawa, 1921

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EXPERIMENTAL STATION, ROSTHERN, SASK.

REPORT OF THE SUPERINTENDENT, WM. A. MUNRO, B.A., B.S.A.

1920-1921

The season of 1920 opened late, and work on the land did not begin until May 3. The crop was not all seeded, either on the Station or in the surrounding district, until the middle of June, during which time there was only one rain—May 18—sufficiently heavy to interrupt seeding operations. There were, however, frequent showers till the end of June, and crops at this time were very promising. In July there was practically no rain till the 22nd, when there occurred the heaviest downfall since records were kept at this Station, but this came too late to save the situation, and many of the crops, especially those on ill-prepared land, were almost a complete failure.

The autumn was remarkable in that there was no frost until September 15, and none which more than blackened potatoes and tomatoes till September 28. This condition allowed for the thorough ripening of all grains, and brought to maturity many garden products such as corn, tomatoes, squash, melons, and cucumbers, that seldom mature in this climate.

WEATHER OBSERVATIONS TAKEN AT ROSTHERN EXPERIMENTAL STATION, 1920-21

Month	Highest	Lowest	Mean	Total Precipitation	Total Sunshine
	Deg. F.	Deg. F.	Deg. F.	Inches	Hours
1920					
April	49·8	−11·0	26·25	0·60	237·5
May	79·6	30·2	51·98	1·32	278·4
June	81·2	33·4	58·79	1·25	316·2
July	95·0	38·0	66·48	2·53	377·8
August	92·4	31·2	64·53	1·67	277·5
September	81·1	28·3	53·22	1·59	239·8
October	78·8	19·3	42·95	1·60	171·9
November	46·6	2·4	24·46	0·18	94·7
December	33·8	−20·8	9·97	0·30	48·5
1921					
January	31·0	−28·7	5·22	0·65	98·1
February	41·0	−32·7	9·06	1·40	104·2
March	41·7	−27·1	10·89	0·16	166·3
Total				13 25	2,410·9
Average precipitation for years 1912-13-14-15-16-17-18-19-20				14·00	2,255·2
Total precipitation for five growing months April to August, 1920				7·37	1,487·4
Average precipitation for five growing months 1912-13-14-15-16-17-18-19-20				8·67	1,347·2

ANIMAL HUSBANDRY

FEED CONDITIONS

The feed shortage throughout the province during the winter of 1919-20 reflected very adversely on all kinds of live stock, and especially on the cattle. Not only was the price of fodder abnormally high, but sufficient could not be obtained at any price, and, as a consequence, many cattle died, while of those that survived a large number were unusually weak. The situation at the Experimental Station was not so serious as on most private farms.

Burning of strawstacks as soon as threshing is completed has been very generally practised in all parts of the West, and it is noteworthy that those farmers who had not burned their straw, but had allowed it to accumulate from year to year, managed to carry their stock through the winter of 1919-20 without having to purchase feed.

The succession of three dry seasons has demonstrated that one of the most difficult problems in live stock raising in the west is pasture crops. Moisture is one essential to plant growth, and there has not been a plant tried at the Rosthern Station which has produced pasture throughout the season for the past three years. Alfalfa, western rye grass, sweet clover, rape and winter rye have all been tried. Winter rye was fairly satisfactory as a fall and spring pasture, except in the spring of 1920, when it had been winter-killed.

HORSES

At the commencement of the year 1920 the Farm had a complement of seventeen work horses, two 2-year-olds, and three yearlings. Three foals were dropped, but one was never very strong and lived for only three weeks. It did not show any of the usual symptoms of navel ill. The mother was poor in flesh and had been worked hard during seeding time. Of the two foals that lived, one had to be fed cow's milk, and until it was six months of age did not thrive. One mare suffered navicular arthritis and had to be shot.

The period during seeding operations is relatively brief, and in order to make the most efficient use of it the maximum available horse-power must be utilized. The number of teams kept for farm work, however, must to a great extent be regulated so that there will not be an excessive surplus of horse-power after the rush of spring work is over which cannot be efficiently and economically employed for the remainder of the year. In order to give an idea of the number of horses required to do the regular farm work throughout the year the following table has been compiled:—

Period	No. of horses required
April	3
May and half of June	17
Half of June and July	15
August	10
September	15
October	16
November	6
December, January, February, March	per month 3

CATTLE

Steer Feeding.—All the grade Shorthorn cattle were disposed of in 1920 with the exception of one Holstein-Shorthorn cross-bred, which is giving promise as a milker. The remainder of the herd consists of pure-bred Holsteins.

Owing to the feed shortage in 1919-20 no steers were fed during the year. In November, 1920, however, twenty steers were purchased at Prince Albert. Five of these were polled and the remaining fifteen were horned. The horned steers were dehorned and for purposes of comparison the dehorned and polled steers were then fed for a two weeks period, each steer being given the same ration. The polled steers were considered as forming one lot, while the dehorned steers comprised the other. The respective weights at the beginning and end of the period were as follows:—

—	No. of Steers in Lot	Gross Weight Nov. 29	Average Weight Nov. 29	Average Weight Dec. 14	Gain or Loss per Steer
Polled	5	5,000	1,000	1,048	48 lbs. gain
Dehorned	15	15,228	1,015·2	1,005·3	9·9 lbs. loss.

It will be noted that the dehorned steers showed during the two weeks an average loss per steer of 9·9 pounds, while the polled steers showed an average gain per steer of 48 pounds.

In order to compare the feeding value of sunflower silage with hay and straw, the steers were divided into two lots of ten each, the first lot receiving sunflower silage with less hay and straw. For the first eleven days of the feeding period twelve pounds of silage were fed, and for the remainder of the period twenty-four pounds were fed. The details of this experiment are as follow:—

—		Lot 1	Lot 2
		Sunflower Silage	Hay and Straw
Number of steers in experiment		10	10
Number of days in experiment		156	156
Total weight at beginning of experiment	Lbs.	10,114	10,116
" " end of experiment	"	12,690	12,260
Gain during period for lot	"	2,576	2,144
" per head	"	257·6	214·4
" per day	"	1·65	1·37
Amount of meal eaten per lot	"	13,590	13,590
" hay " "	"	3,300	6,270
" straw " "	"	11,300	21,470
" ensilage " "	"	36,120	.....
Total cost of feed	$	325 25	262 97
Cost of feed per head	$	32 52	26 29
" " per day	$	·208	·168
" " pound gain	$	·126	·122
Original cost of steers	$	705 00	705 15
" " and cost of feed	$	1,030 25	968 12
Selling price per lot	$	968 80	925 20
Net loss per lot	$	61 45	42 92
" steer	$	6 14	4 29
Freight to Winnipeg and expenses	$	109 30	109 30
Net returns per lot	$	859 50	815 90
Net loss per lot	$	170 75	152 30

The results from this feeding experiment show a considerably larger gain for the steers fed the sunflower silage; but this gain was made at a somewhat higher cost. The low selling price obtained in conjunction with the relatively high cost of feeds, and the expenses incidental to marketing, were all contributory factors to the losses suffered in this experiment.

SHRINKAGE

No. 26—Purchase weight in Prince Albert	20,785	lbs.
Weight delivered in Rosthern before feeding and watering	19,634	"
Total shrinkage	1,151	"
Shrinkage per steer	57·55	"
Difference in price between Prince Albert and Rosthern to make up for expenses and shrinkage	.58	per cwt.

SHRINKAGE—*Concluded*

May 19—Weight at Rosthern	24,950	lbs.
Weight at Winnipeg after feeding and watering	23,810	"
Shrinkage	1,140	"
Shrinkage per steer	57	"
Difference in price between Rosthern and Winnipeg to make up for expenses and shrinkage	$1.34 per cwt.	

Dairy Cattle.—From a start of two pure-bred Holstein heifers in 1914 there were at the end of March, 1921, 5 cows, 5 heifers and 1 heifer calf. The herd bull, up to the end of 1919, was Sir Johanna Pontiac, of Ottawa, No. 27263 by Sir Johanna Ormsby of Hickory No. 18811 and out of Pontiac Belle of Manor No. 24497. A new herd bull was secured in 1920, L.E.S. Abbekirk Mechthilde No. 41326 by Prince Aaggie Mechthilde No. 8482 and out of Nina Gem Lutske No. 10674. Prince Aaggie Mechthilde has a record of 23 R.O.M. daughters and Nina Gem Lutske has a record as a senior yearling of 351 pounds milk and 13·38 pounds butter in 7 days and 15,433 pounds milk, 577·5 pounds butter in 1 year.

Following are the yields of milk of the 5 Holstein cows that were in milk during the year 1920-21. These yields are not large, but it must be considered that the feed and especially the hay was of poor quality in 1919-20 and the pasture was very bare during the summer of 1920.

Name	Born	Days in milk	Total lbs. Milk	Remarks
Mayflower Sylvia	Aug. 20, 1913	479	8,658·5	Suffering from defective teeth.
R.E.S. Sarcastic Sylvia	Apr. 3, 1916	304	7,893·0	Lactation period not completed.
R.E.S. Madrigal Sylvia	Sept. 20, 1917	307	7,166·8	
Bonnieview Gypsy Keyes	Mar. 14, 1914	392	10,678·5	
Madrigal Gypsy Keyes	Apr. 24, 1917	273	7,162·3	

SHEEP

The sheep came through the winter of 1919-20 in poor condition. There were no roots to feed them, and the hay was limited and of poor quality, although they had the usual amount of grain, which is three-quarters of a pound per sheep per day, until the end of February, and then one pound per day. Following the hard winter was a dry summer of poor pasture. From a flock of one hundred ewes, of which eighty were bred, only fifty-three lambs were raised to maturity.

The returns from the flock were much lower in 1920 than in the previous four years. This was partly due to prices and partly due to the smaller number of increase. Price of pelts was 30 cents in 1920 against $2 in 1918, wool was 24 cents against 59 cents in 1918, and mutton was 14 cents and 16 cents against 23 cents in 1918.

Following is a statement of the returns from a start of 100 range-bred ewes in December, 1915, and leaving a flock of the same number:—

—	1920	Total for 5 years	Average 5 years
	$ cts.	$	$
Wool	127 24	2,245	499
Mutton	353 31	2,428	486
Pelts	15 90	482	96
Total	496 45	5,155	1,031

SWINE

The spring of 1920 was our first experience with hairlessness in pigs, and of 141 born, 89 were hairless, either partially or wholly, and were either born dead or died shortly after. Pigs of normal appearance in litters of hairless pigs proved weak, and not many of them lived more than a couple of weeks. Only 24 pigs reached maturity.

Twenty-four pigs were fed shorts and milk till about two months old and were then put into a field with shade and water, and fed shorts and milk in small quantities, and gradually worked off to a meal ration of oat and barley chop.

Average weight at beginning	52·7	lbs.
Weight at end of 131 days	119·0	"
Average weight of meal consumed	380·0	"
Pounds of meal for one pound gain	5·73	"

Fourteen pigs averaged 104 pounds were fed from October 17 till March 9.

Average weight at beginning	104·0	lbs.
Weight at end of 153 days	239·0	"
Average weight of meal consumed	789·0	"
Pounds meal for 1 pound gain	5·8	"

Twenty-seven pigs were put on feed on March 10 for fattening.

Average weight at beginning	124·0	lbs.
Average weight at end of 69 days	220·7	"
Average weight of meal fed	517·0	"
Pounds meal for 1 pound gain	5·3	"

CEREALS

The results at Rosthern in tests of varieties have been more satisfactory this season than they were for the two previous years, because of less damage due to soil drifting. The plots are located on a part of the farm which had been cropped to grain for a number of years prior to its being taken over by the Government, and it has not yet been brought up to a suitable tilth by manure or grass to cause it to withstand the winds. In 1918 and 1919 the land for these tests had been worked down to a fine seed bed by use of the cultivator and harrows the spring following summer-fallow, with the result that the soil with the seed that was in it lifted and went away with the first strong wind. In 1920 the land which had been summer-fallowed in 1919 was worked with the broad tooth cultivator only, and seeded. The condition was not that of an ideal seed bed, for the surface was a mass of lumps. The lumps, however, prevented the drifting, and a fair crop was the result.

WHEAT

The area of each plot was one-fortieth acre. There were eighteen varieties of wheat tried, with the following results from the leading varieties:—

WHEAT—TEST OF VARIETIES

Variety	Yield, 1920		Days Maturing	Yield 5-year average, 1911-1915		Remarks
	bush.	lb.		bush.	lb.	
Kubanka	24	40	107	34	46	3-year average, 1913-1915
345 El A	21	40	96			
Ruby	21	20	94			
Red Fife	21	20	107	42	20	
Pioneer	21	20	97	34	45	4-year average, 1912-1915
Marquis	16	.....	101	51	19	
Prelude	12	40	91	26	50	4-year average, 1912-1915

345 El A and Ruby are varieties recently introduced by the Dominion Cerealist. Ruby has been tried by us for three years, and promises to be, on an average, almost as high in yield as Marquis and a few days earlier; 345 El A stands relatively high but as this is its first test at this Station little can yet be said concerning it. If there is anything to be deduced from this year's test, we would conclude that it is very suitable for the dry areas. This is the first year that Kubanka has stood at the head of the list in point of yield, and as this is the season of least moisture in which we have carried on variety tests one might be led to conclude that Kubanka is a very suitable variety for dry areas. Kubanka and Red Fife would have been worthless had frost come before the first of September this year. Both Kubanka and Red Fife were badly affected with rust.

Three half-acre plots of the Ruby, Preston and Marquis were sown on stubble with the following results:—

COMPARATIVE TEST—WHEAT

Variety	Yield per acre		Days Maturing
	bush.	lb.	
Ruby	15	32	88
Preston	13	52	96
Marquis	7	16	93

OATS

The yields of oats on fortieth-acre plots on summer-fallow were as follows:—

COMPARATIVE TEST—OATS

Variety	Yield per acre		5-year average	
	bush.	lb.	bush.	lb.
Banner	41	6	105	16
80 Day	29	14	80	4*
Gold Rain	28	8		
20th Century	27	22	101	21
O.A.C. 72	25	30		
Victory	25	10	127	15
Daubeney	24	24	81	21
Ligowo	22	12	96	8
Liberty (hulless)	19	14		

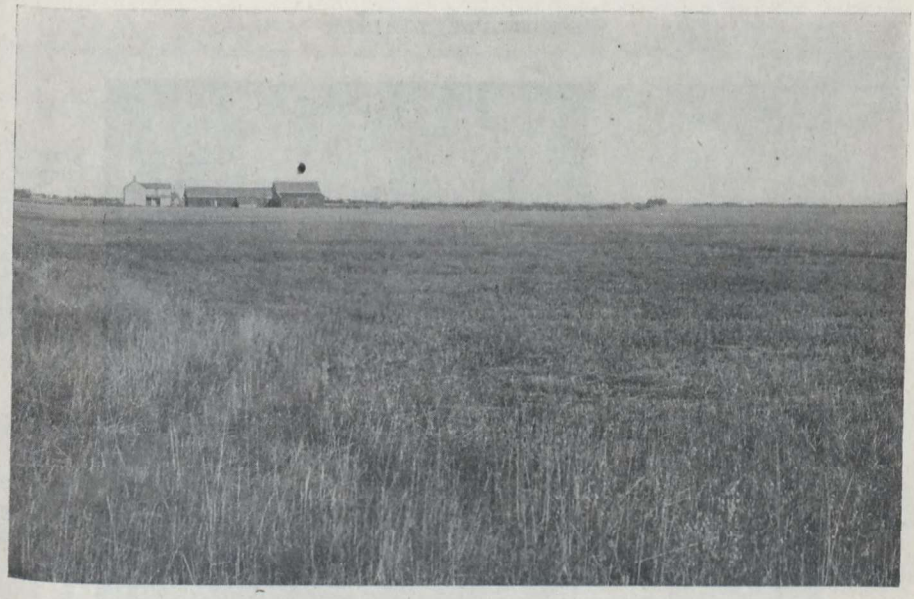
*80 Day was not grown in 1911, which was a year of high yields. 80 bush. 14 lbs. is a 4-year average.

The oat plots were very short and uneven, due to the excessively dry weather during the latter part of June and the first three weeks in July. On the 22nd and 23rd of July, 2¼ inches of rain fell, and while it filled the oats better than would otherwise have been the case, it also started second growth, which was very detrimental to the sample of grain.

Half-acre plots of the three leading varieties of oats were sown on spring ploughed stubble land, with the following results:—

COMPARISON OF YIELDS—OATS

Variety	Yield per acre	
	Bush.	Lbs.
Banner	26	6
Ligowo	25	10
O.A.C. 72	25	



Experimental Station in 1909

Same View in 1920

Holstein Calves, Experimental Station, Rosthern, Sask.

BARLEY

The yields of barley on fortieth-acre plots on summer-fallow were as follows:—

VARIETY TEST—BARLEY

Variety	Yield per acre		(1911–1915) 5-year average	
	bush.	lb.	bush.	lb.
Taganrog	16	12	63	36
Swedish Chevalier	16	12	58	05
Gold	13	36		
Success	13	36		
Duckbill	13	36	65	45
Swan's Neck	13	36	73	12
Stella	12	4	66	24
Albert	11	32		
O.A.C. 21	11	32	73	20
Early Chevalier	11	12	61	44
Odessa	6	32	63	12

The barley plots, all except the very late varieties, which were very short, suffered more from dry weather than either the oats or wheat. The later varieties, such as Swedish Chevalier, Swan's Neck and Duckbill, were badly damaged by rust. O.A.C. 21 was damaged slightly by rabbits during the early part of June. The earlier varieties were so short that it was very hard to make a clean job of harvesting, and consequently the loss was greater on these than on the later varieties.

Half-acre plots of four varieties of barley were sown on spring ploughed stubble land and yielded as follows:—

COMPARISON OF FIELDS—BARLEY

Variety	Yield per acre	
	bush.	lbs.
Swedish Chevalier	17	24
Manchurian	14	38
Early Chevalier	13	26
O.A.C. 21	11	22

PEAS

Four varieties of field peas were grown on one-fortieth-acre plots and yielded as follows:—

Variety	Yield per acre	
	bush.	lbs.
30 K2	16	0
32 D	13	20
30 D	9	20
Arthur	7	20

The numbered varieties are new productions by the Dominion Cerealist. Arthur has heretofore been the highest yielding variety.

BEANS

Three varieties of field beans were tried, but they made poor growth and yield was slight.

FLAX

Three varieties of flax were grown on one-fortieth-acre plots with the following results:—

VARIETY TEST—FLAX

Variety	Yield per acre	
	bush.	lbs.
Novelty	12	28
Premost	11	24
Longstem	11	24

HORTICULTURE

The moisture during the season was not up to the average. The rainfall for the year was 13.25 inches, which is 0.75 inch less than the average of the nine years 1912 to 1920, inclusive, and for the five growing months was 7.37 inches, which is 1.30 inches less than the nine-year average for the same period. It is noteworthy, however, that where the garden was protected by caragana hedges, the crop did not suffer for lack of moisture, whereas in the parts that were not protected many of the crops suffered.

A notable feature of the season was that there were no killing frosts from May 1 to September 29. This allowed for the ripening of many tender vegetables that do not often ripen in this climate.

Perennial vegetables, such as asparagus, rhubarb and horse radish, did well in 1920. It requires five years to establish an asparagus bed.

All varieties of annual vegetables yielded more highly and reached greater maturity in 1920 than in any year previous; and especially was this the case with those that are usually cut off with early frosts, such as corn, tomatoes, cucumbers, melons, squash and pumpkins. One pumpkin weighed, when ripe, 44½ pounds.

The flower borders show improvement every year owing to the continuously improved condition of the soil and to the greater efficiency of the windbreaks.

THE VEGETABLE GARDEN

The prime requisite for a vegetable garden is an efficient windbreak. In 1912, caragana was planted around blocks 400 feet by 200 feet, with the long way north and south. These hedges have now reached a height of 12 feet, and form adequate protection for the vegetable garden against winds. Such a hedge is proof against the ill effects of drouth in the most adverse seasons in Northern Saskatchewan. We have found it unnecessary to summerfallow this land since 1914, and a heavy crop of vegetables was produced, even in the dry years of 1918, 1919, and 1920.

POTATOES

Thirty-three varieties of potatoes have been tried for from one to ten years, with varying yields from year to year, and in various orders of yield. An instance of the difference in the order of yield is that of Empire State, which was highest of all varieties in 1911 and thirteenth in 1920. The two varieties recommended more than any others are Irish Cobbler and Early Ohio. These do not yield so highly as some of the others, but they are of outstanding quality.

Following is a table showing the yields of 19 most common varieties tried since 1911:—

VARIETY TESTS—POTATOES

YIELD OF POTATOES IN BUSHELS PER ACRE

Variety	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
Reeves Rose	484	659	456	316	259	223	458	249	359	165
Early Ohio	.....	.....	75	284	265	306	414	301	308	157
Late Puritan	431	699	529	320	213	195	409	214	426	157
Vick's Extra Early	431	625	515	316	251	205	408	227	350	186
Gold Coin	452	841	514	306	205	183	391	232	391	188
Dalmeny Beauty	448	744	389	316	210	223	389	203	452	236
Rochester Rose	453	807	526	326	252	198	380	241	344	164
Bovee	.....	.....	.....	121	240	257	379	245	273	143
Everett	497	824	523	372	275	233	374	288	429	180
Rawling's Kidney	479	804	562	326	227	221	374	220	463	188
Dreer's Standard	528	840	596	370	219	191	370	244	421	192
Irish Cobbler	365	573	437	242	232	226	367	225	382	159
Moneymaker	514	822	494	353	245	194	366	210	412	191
Carman No. 1	356	536	530	313	195	190	364	213	421	207
Empire State	585	590	478	316	215	203	363	177	407	182
Wee MacGregor	.....	774	574	326	195	256	360	211	447	171
Morgan Seedling	475	848	634	362	270	192	305	246	431	175
Burbank Seedling	.....	.....	487	279	186	167	298	192	391	237
Table Talk	.....	659	540	247	161	172	255	155	380	178

Following is a table showing the yields per acre from various methods of cultivation conducted at different times from 1911 to 1919.

COMPARISON OF METHODS OF CULTIVATION

—	1912	1913	1914	1915	1916	1917	1918	1919
DEPTH OF SEEDING—								
2 inches	465	531	391	270	254	364	212	385
4 inches	659	540	297	288	280	335		
6 inches	775	526	276	291	234	370	183	306
4 inches and 4 in. subsoil	789	498	.....	281	240			
DISTANCE APART—								
12 inches by 30 inches	657	505	271	287	193	314	153	324
14 inches by 33 inches	609	528	242	273	195	.....	151	308
15 inches by 36 inches	570	394	242	223	187	330	144	326
METHOD OF PLANTING								
Planter alone	.....	.....	.....	.....	.....	452		
Planter preceded by plough	.....	.....	.....	.....	.....	382		
Ploughed and planted in 3rd furrow	.....	.....	.....	.....	.....	323		
Planter preceded by subsoil	.....	.....	.....	.....	.....	422		
Subsoiled and planted in 3rd furrow	.....	.....	.....	.....	.....	355		
Opened with plough at 2½ feet	.....	.....	.....	.....	.....	459		
CULTIVATION—								
Hilled	620	567	244	288	.....	.....	204	436
Level	645	527	291	254	.....	.....	264	
Level three times	.....	.....	.....	.....	256	475	199	402
Level six times	.....	.....	.....	.....	173	441	.....	
Level twice and hilled	.....	.....	.....	.....	179	377	186	401
KIND OF SETS—								
Stem end	615	.....	.....	.....	.....	.....	192	450
Seed end	703	.....	.....	.....	.....	.....	189	293
Whole tubers, large	867	.....	.....	.....	279	.....	162	339
Whole tubers, small	.....	.....	.....	.....	186			
One eye	.....	.....	.....	.....	112	.....	231	263
Two eyes	.....	.....	.....	.....	164	.....	192	317
Three or more eyes	.....	.....	.....	.....	207	.....	217	353
TIME OF PLANTING—								
May 7	.....	.....	.....	271				
May 15	.....	.....	.....	233				
May 23	.....	.....	.....	235				
June 18	.....	.....	.....	131				

From various cultural experiments with potatoes conducted over a number of years the following methods are recommended:—

Plant early in May.
Cut sets to two eyes.
Plant four inches deep.
Plant 12 inches apart in rows 30 inches apart.
Cultivate level till middle july and then give slight hilling.

ARTICHOKES

Jerusalem artichokes were planted in 1920 and did well.
The yield from a 30-foot row was 20 pounds 12 ounces.

ASPARAGUS

Roots were planted in hills 5 feet by 6 feet in 1913, in rich, well manured soil. A small amount was cut for use in each year from 1917 to 1920. The shoots were of good size, approximating three-quarters of an inch in diameter.

This vegetable may be considered quite satisfactory from the standpoint of a home garden, but not as a commercial proposition.

BEANS

Following are the yields of green beans from 30-foot rows in 1920:—

VARIETY TEST—BEANS

Variety	Ready for use	Yield lbs.	Yield ozs.
Stringless Green Pod	July 20	1	10
Ex. Early Red Valentine	" 18	7	11
Kentucky Wonder Wax	Aug. 20	2	—
Hodson Long Pod	" 15	—	—
Bountiful	July 20	7	11
Fordhook Favorite	" 18	5	9
Wardwell Kidney Wax	" 20	3	4
Pencil Pod Black Wax	" 25	4	5
Pencil Pod Kidney Wax	" 20	3	8
Davis White Wax	" 20	4	7
Refugee	Aug. 12	—	—
Grennel Rustless Wax	July 18	5	4
Plentiful French	" 20	7	5
Masterpiece	" 18	7	11

For the home garden, quality and length of time fit for use are important considerations. Wardwell Kidney Wax is a bean of high quality, and in 1919 was ready for use on July 22 and lasted for 52 days.

BEETS

Following was the yield of table beets in 1920:—

Variety	Origin of Seed	Yield	
		lbs.	oz.
Detroit Dark Red	Ottawa	115	14
" "	" (A. O. 9520)	91	2
" "	Rosthern	86	8
Early Wonder	McDonald	100	14
Crimson Globe	"	148	8
Eclipse	"	103	8
Crosby Egyptian	Harris	90	2
Black Red Ball	Burpee	71	1
Early Model		89	8

An attempt was made in 1918 and 1919 to grow beet seed. In 1918 the plants were frozen and in 1919 there were 4 pounds 8 ounces seed from a 30-foot row.

BRUSSELS SPROUTS

There is little demand for this vegetable on the Western Canadian menu, but it has never suffered from adverse weather conditions in all the years it has been tried at this Station. In 1920 its growth was slightly retarded by plant lice. The yield from a 30-foot row in 1919 was 17 pounds 13 ounces.

CABBAGE

The following varieties were under test in 1920. These were sown in the hotbed on April 26 and planted in the open on May 29. The yield per acre is computed from a 30-foot row.

VARIETY TESTS—CABBAGE

Variety	Ready for use	Weight of 10 heads	Average weight per head	
		lbs.	lbs.	oz.
Marblehead Mammoth	Aug. 20	71	7	1
Enkhuisen Glory	" 20	72	7	3
Fottler Imp. Brunswick	" 26	66	6	9
Delicatesse	Sept. 1	38	3	13
Flat Swedish	" 1	82	8	3
Perfection Drumhead	" 1	29	2	14
Copenhagen Market	Aug. 5	85	8	8
Selected Jersey Wakefield	July 26	40	4	—
Ex. Amager Danish Ballhead	Sept. 1	74	7	6

Copenhagen Market is the best cabbage for this district, both as an early and late variety.

CARROTS

Following is the yield of garden carrots sown in rows 30 feet long:—

VARIETY TEST—CARROTS

Variety	Seed From	Yield	
		lbs.	oz.
Danvers	Kentville	36	—
Chantenay	Ottawa	47	—
Half long Scarlet Nantes	D. & F.	49	12
Early Scarlet Horn	"	47	4
Improved Danvers	"	53	12
Chantenay	Rosthern	49	12

In 1918 carrot seed was grown, of the variety Half Long Chantenay. The carrots had been stored packed in earth in a cellar for the winter, and planted on May 15. The seed was harvested in September. From a 30-foot row there were 4 pounds of seed.

CAULIFLOWER

Two varieties of cauliflower were sown in the hotbed on April 26, transplanted on May 29, and were first ready for use on August 5. Early Snowball yielded 23 pounds 7 ounces, and Dwarf Erfurt yielded 25 pounds 7 ounces from 30-foot rows.

In 1918 an attempt was made to grow seed, but the plants were frozen on September 2.

CELERY

Carloads of celery are annually imported to northern Saskatchewan, while at the same time a few amateur gardeners in this province are growing celery of a very superior quality. Celery has been grown in trenches and on the level; and of that planted on the level three methods of bleaching were used. In every case the plants were 6 inches apart, in rows 30 feet long.

Following are the results in 1917:—

1. Planted on level and blanched with strips of pliable roofing, 18 inches wide 85 lbs.
2. Planted on level and blanched with 12-inch boards.. .. .. 76 "
3. Planted on level and blanched with earth.. .. .. 80 "
4. Planted in trench and blanched with earth.. .. .. 68 "

While the yield of No. 3 was not so great as that of No. 1, the quality was superior to that of No. 1 and No. 2, and the labour and expense much less. Trenching celery is not recommended.

In 1920 the following were the results of varieties as determined from rows 15 feet long. These were sown in boxes on March 25, germinated on April 17 and planted in the open on June 16:—

VARIETY TEST—CELERY

Variety	Ready for use	Yield	
		lbs.	oz.
Evans' Triumph	Oct. 1	38	12
Giant Pascal	Oct. 1	52	8
Paris Golden	Sept. 15	30	14
Winter Queen	Oct. 1	48	12
White Plume	Sept. 15	18	12

CITRONS

Very seldom do citrons come to maturity, because of frost; but in 1920 there was a yield of 36 fruits, weighing 158 pounds, from a row 30 feet long.

CORN

Since adequate protection has been provided by means of windbreaks, garden corn has done well every season.

Following are the results of varieties tried in 1920, as determined from 30-foot rows:—

VARIETY TEST—CORN

Variety	Ready for use	Total number of ears
Howling Mob	Sept. 6	34
Golden Giant	Aug. 30	21
Early Fordham	Sept. 8,	42
Golden Bantam (Burpee)	" 8	45
Stowell Evergreen	" 27	7
Country Gentleman	" 27	6
Black Mexican	" 22	36
Early Sweet Otta	Aug. 30	39
Early Malcolm	" 30	39
Pickaninny	" 13	86
Early Sweet Kloochman	" 25	60
Early Sweet Squaw	" 30	51
Square Deal	" 30	39
Will Gehu	" 30	65
Golden Bantam (McDonald)	Sept. 8	36
Early Mayflower	Aug. 30	22
Pocohontas	Sept. 8	42
Extra Early Cory	Aug. 30	16
White Squaw	" 17	72

Only some seasons are favourable for the ripening of garden corn in this district. In 1919, 24 pounds of ripe ears were harvested from a 30-foot row of Golden Bantam.

CUCUMBERS

In 1920, seed was planted in the hotbed on April 26, pricked out to cold frame on May 8, and transplanted to open on June 30.

Following are the results from three hills of each:—

VARIETY TEST—CUCUMBERS

Variety	Ready for use	No. of fruits
Davis Perfect	Aug. 13	61
Imp. Long Green	" 13	37
Giant Pera	" 13	64
Davis Perfect	" 13	22
Early Russian	" 13	112
West India Gherkin	" 23	(5¼ lbs.)

KALE

Kale, like cabbage and Brussels sprouts, is hardy for these parts; but, unlike cabbage, is very seldom grown and little appreciated, except by Old Country people. In 1920, the plants reached a height of three feet.

MELONS

Very seldom do watermelons come to maturity in this climate, and they cannot be recommended.

Muskmelons did not come to maturity in 1917 and 1918 but did ripen in 1919 and 1920 after being picked. Following are the results from 30-foot rows in 1920:—

VARIETY TEST—MELONS

Variety	No. of fruits
Emerald Gem	23
Rocky Ford	—
Extra Early Hackensack	29
Paul Rose	39
Montreal Imp. Nutmeg	18

ONIONS

Seed was sown in the open on May 23, and the crop harvested on September 1. Following are the yields from 30-foot rows:—

VARIETY TEST—ONIONS

Variety	Yield
	lbs. oz
Yellow Globe Danvers (Graham)	12 8
" " (Ottawa)	15 10
Southport Yellow Globe	16 4
Large Red Wethersfield (Ottawa)	18 12
" " McDonald)	16 10
Mammoth Silver King	11 8
Australian Brown	11 14
Extra Early Flat Red	15 3
White Barletta	6 9
Southport White Globe	13 7
Southport Red Globe	16 10
Ailsa Craig	20 0
Giant Prizetaker	18 8
Giant Red Wethersfield	14 8

PARSLEY

All varieties of parsley tried have made good growth every season.

PARSNIPS

Hollow Crown parsnip seed grown at Ottawa, and seed of the same variety grown at Rosthern, were tried in 1920 with practically the same results. From 30-foot rows the yield from the Ottawa seed was 44 pounds, and from the Rosthern seed 43 pounds.

PEAS

Varieties of garden peas were sown in 30-foot rows on May 23, with the following results:—

VARIETY TEST—PEAS

Variety	Ready for use	Yield
		lbs. oz.
Gregory Surprise	July 17	0 12
Early Moon	" 28	3 12
Pioneer	" 20	3 0
Laxtonian	" 18	3 0
Eight Weeks	" 20	3 4
Stratagem	Aug. 5	6 0
Gradus (Carter)	July 18	3 4
American Wonder	" 20	5 4
English Wonder A	" 18	6 8
McLean Advancer	" 22	7 8
Sutton Excelsior	" 20	3 8
Gradus (Kentville)	" 18	4 0
Little Marvel	" 20	7 12
Thomas Laxton	" 20	3 12

It is desirable to have green peas fit for use over as long a period as possible, and this cannot be done by making different sowings of the same variety on different dates, for they will mature about the same time no matter when sown. It is better to sow different varieties. The following are recommended:—

Early—Gregory Surprise.
Medium—Gradus, Laxtonian, English Wonder.
Late—Stratagem.

PEPPERS

Two varieties of peppers were sown on March 30 in flower pots, transferred to hotbed later, and planted in the open on June 7.

The same varieties were sown in the open on May 23. Following are the results:—

VARIETY TEST—PEPPERS

Variety	Sown in pots				Sown in open			
	Ripe		Green		Ripe		Green	
	lbs.	oz.	lbs.	oz.	lbs.	oz.	lbs.	oz.
Neapolitan	2	4	15	10	—	—	1	15
Harris Early	1	2	10	5	—	—	—	14

To obtain best results the seed should be started early in the hotbed.

PUMPKINS

Pumpkins are usually caught by frost, but this was not so in 1920. Seed was sown in the hotbed on April 26, and transplanted to the open on May 30. Following are yields:—

VARIETY TEST—PUMPKINS

Variety	Ready for use	Yield	
		Number of fruits	Weight in lbs.
King of the Mammoth	Sept. 16	7	115
Connecticut Field	Aug. 28	10	114
Small Sugar	Sept. 16	7	28
F. A. Blain	Sept. 16	4	90

The variety listed as "F. A. Blain" was seed received from a gentleman of that name, from pumpkins raised in Saskatoon the previous year. One pumpkin of this variety weighed 44½ pounds.

RADISH

An experiment was conducted in 1920 on the relative merits of seed from different sources. The variety used was Early Scarlet White Tipped. The seed was sown in the open on May 26 and the plants were ready for use on June 20.

VARIETY TEST—RADISH

Seed from	Quality
Dupuy & Ferguson	Fair
Burpee	"
Central Farm, Ottawa	Bad
Gregory	Fair
Thorburn	Good
Rosthern	Bad

In 1919 some radish seed was grown. Seed was sown on May 7, and ripe seed from these plants was harvested on October 1. From a 30-foot row there was 1 pound 8 ounces of seed.

RHUBARB

Much difficulty is experienced by gardeners in growing this vegetable, but at the Experimental Station it has always done well. On inspection of a number of gardens the following reasons are deduced for lack of success:—

1. *Cropping too closely.*—At least half a dozen leaves should be left on the plant all the time.

2. *Leaving the plants too long.*—After a rhubarb plant has borne for two years it should be lifted in the fall or spring and split into pieces, each piece bearing a bud, and each piece planted as in the original plantation. By selecting only the best plants for this purpose a choice variety is soon developed. No stalks should be taken from these plants the first year.

3. *Lack of manure.*—The rhubarb should be supplied with large quantities of well-rotted manure.

Following are directions for starting a rhubarb plantation from seed:—

Sow the seed in a row about two inches apart and about one inch deep. Cover and press firmly with the foot, and rake so as to leave the surface rough. When the plants are up, thin to about six inches apart.

Keep clear of Weeds—

When the plants are a year old transplant to a permanent plantation in rows four feet apart each way.

Do not use any stalks till a year from the time they are transplanted.

Renew the plantation every two years.

Some plants will be found much superior to others. Dig up the best plant in the spring or fall, and cut the roots so that there is one bud to a piece, and plant one piece in a place, the same as the one-year seedlings were planted.

Use plenty of rotted manure every year in the rhubarb plantation.

SALSIFY

Following is the yield of salsify sown in 30-foot rows in 1920:—

Variety	Seed From	Yield	
		lbs.	oz.
Long White	Ewing	30	—
" "	Ottawa 889	22	5
" "	Rosthern	21	4
Mammoth Sandwich Island	Ottawa 9271	31	11

SQUASH

Squash, like pumpkins, do not often come to maturity, because of early fall frosts, but in 1920 there was a good yield.

VARIETY TEST—SQUASH

Variety	Ready for use	Yield	
		lbs.	oz.
English Vegetable Marrow	Aug. 28	173	8
Hubbard	Sept. 15	62	6
Golden Hubbard	" 15	73	10
Delicious	" 15	74	6

TOMATOES

Some difficulty had been experienced in ripening tomatoes in our garden until two conditions were complied with.

1. Securing an effective windbreak.
2. Training the plants to stakes and trimming them to one stalk.

In 1920 there were sixteen varieties started in boxes in the house on March 25, and planted in the open on June 1.

Following is a table showing the seven most promising varieties, with the date on which they were ready for use and the yields of both ripe and green tomatoes:—

VARIETY TEST—TOMATOES

Variety	Ready for use	Yield			
		Ripe		Green	
		lbs.	oz.	lbs.	oz.
North Adirondack (Rosthern seed)	Aug. 26	16	2		30
Dr. Weaver (Saskatoon seed)	" 26	15	10		33
Danish Export (Ottawa seed)	" 23	15	7		26
Prosperity (Rosthern seed)	" 18	15	2		42
Prosperity	" 23	15	..		39
Burbank Early (Ottawa seed)	" 18	15	—		33
Alacrity Strain (Rosthern seed)	" 26	15	—		28

TURNIPS

Four varieties of white turnip were grown, but the flavour of all was rather bitter and undesirable. Hall's Westbury, a swede turnip, is much more desirable from the points both of flavour and of keeping qualities.

FLOWERS

ANNUALS

There were forty-nine varieties under test in 1920. The bloom was more abundant than in 1918 and 1919, but not on a par with that of former years, owing to the dry season.

BULBS

Some tulips were stored in sand over the winter 1919-20, but were nearly all spoiled; 4,300 tulips, 320 narcissi and 25 hyacinths were planted in the fall, and came through in excellent condition.

PERENNIALS

The new perennial border made a very good average showing in 1920. Some of the young plants were winter-killed.

ORNAMENTAL TREES AND SHRUBS

Upwards of six hundred trees and shrubs were planted in 1911, and a number have been added since. Most of these have proved hardy, and now make a profusion of bloom every season.

FRUITS

BLACK CURRANTS

Twelve varieties have been under test since 1912. Following is the table of yields in 1920:—

VARIETY TEST—BLACK CURRANTS

Variety	Date 1st picking	Yield in standard berry boxes	Size of fruit
Success	July 26	8½	Medium
Climax	Aug. 12	11	Small
Magnus	July 31	8½	"
Eagle	" 28	11¼	
Topsy	Aug. 9	8½	"
Lee Prolific	" 10	8	"
Collin Prolific	" 18	4	"
Eclipse	July 31	2	"
Clipper	Aug. 18	2½	"
Buddenborg	July 31	5½	Medium
Boskoop Giant	" 31	3¼	"
Victoria	Aug. 18	1½	"

RED CURRANTS

Following are the yields in 1920 of 13 varieties planted in 1912:—

VARIETY TEST—RED CURRANTS

Variety	Date 1st picking	Yield in standard berry boxes
Stewart	July 30	29¾
Raby Castle	Aug. 18	20½
North Star	July 30	38
Red Dutch	Aug. 13	17½
Red Grape	" 2	22
Pomona	July 27	38
Rankin Red	" 30	43
Franco-German	Aug. 10	29¼
Wilder	July 27	1¾
Long Bunched Holland	" 30	60¼
Cumberland	" 30	22
Victoria	" 31	41¾
Greenfield	" 28	19¼

WHITE CURRANTS

Three varieties have been under test since 1912, with the following results in 1920. They were picked on July 30.

VARIETY TEST—WHITE CURRANTS

Variety	Yield in standard berry boxes
White Grape	28
Large Grape	12½
White Cherry	29¼

A new plantation of bush fruits was set out in 1920 to replace the old one when the former comes into bearing.

RASPBERRIES

The old plantation had been removed and the new one had not yet come into bearing in 1920.

Herbert is the outstanding variety of raspberry yet tried, both in point of flavour and of yield.

STRAWBERRIES

Only one variety of strawberries was under test in 1920. This was Minnesota No. 3. It was first ripe on July 20. There were five pickings and a yield of 32 pints.

A new plantation was started in 1920, made up of Senator Dunlap, Minnesota No. 4, Minnesota No. 3, Dakota and Americus.

PLUMS

Three hundred and fifty seven plum trees planted in 1914 bore fruit in 1920 for the first time, and 21 trees planted in 1911 have been bearing for the third season. Of these, 133 yielded only small amounts, and the remainder yielded 453 standard berry boxes, or 362 quarts. There was nothing of outstanding quality, but it is hoped to make some fairly good selections from them.

APPLES

Much money has been spent by settlers throughout the west in the purchase of apple trees, with practically no returns. In most cases the trees winter-kill, and of the few that survive, the tops kill back and branches develop from the stock on which the graft was made.

This, too, has been the experience at the Rosthern Station. Of several hundred planted in 1911, only thirty survive, but these are gradually coming into bearing. They are all crab apples, and are very good for cooking.

FIELD HUSBANDRY

The rotations begun in 1911 and interrupted in 1916 and 1917 because of the enlargement of the Farm and consequent rearrangement of fields, and interrupted again in 1918 and 1919 because of soil drifting, were recommenced in 1920.

The three-year rotation of summerfallow, wheat, wheat, has had to be abandoned because of its tendency to deprive the soil of everything that might help to withstand soil drifting. The area heretofore devoted to this is being used for grass experiments.

The five-year rotation of summer-fallow, winter rye, wheat, oats and barley, gave fair returns during the three dry years, but the land devoted to this work had been broken from prairie sod subsequent to 1911, and had sufficient residue from the sod to prevent soil drifting. Now it is showing depletion of fibre, and will require to be changed so as to include a grass crop.

Rotation "R," a nine-year rotation involving two summer-fallows, three wheat crops, one oat crop, two hay crops and one corn crop, has always been the most profitable rotation when we can grow corn; but as there have been only two good corn crops in eight years it does not show well on the average. In 1920, sunflowers were substituted for corn, and yielded about 6½ tons of green ensilage per acre. Sunflowers being a sure crop almost every year, it is expected that this rotation will show regularly high profit.

Rotation "P," an eight-year rotation, involving two summer-fallows, three wheat crops, one barley crop, two hay crops and a turnip crop has usually given comparatively low profits per acre, due to the high cost of labour in growing the root crop.

Both rotations "P" and "R" are not very practicable on a private farm because they involve too many fields. They are both really double rotations.

Rotation "J" is a six-year rotation, and, although not involving a hoed crop, is much more adaptable to practical farming. It consists of summer-fallow, wheat, wheat, oats seeded down, hay, pasture. By substituting sunflowers for either wheat crop a very practical rotation is the result.

Following are tables showing profits per acre of the different rotations worked out on a uniform basis of cost and return values:—

STATEMENT OF RETURN VALUES

Wheat (from the machine)	per bush.	$ 2 27
Barley " " "	"	0 85
Oats " " "	"	0 65
Western rye grass hay	per ton	12 00
Oat straw	"	4 00
Wheat straw	"	1 00
Barley straw	"	1 00
Sunflower	"	7 00
Turnips	"	7 00

STATEMENT OF COST VALUES

Rent	per acre	$ 4 00
Barnyard manure spread on fields (charged equally over all years of the rotation)	per ton	1 50
Seed wheat	per acre	3 00
" oats	"	2 00
" barley	"	2 00
" rye	"	1 60
" turnip	per lb.	1 00
" sunflower	"	0 25
" western rye grass	"	0 11½
Machinery	per acre	1 00
Horse labour (including teamster)—		
Single horse	per hour	0 62½
Two-horse team	"	0 75
Three-horse team	"	0 87½
Four-horse team	"	1 00
Threshing—		
Wheat	per bush.	0 15
Oats	"	0 12
Barley	"	0 13
Twine	per lb.	0 24

NOTE.—These values are based on 1920 prices.

ROTATION RECORD

Station—Rosthern

Rotation—5-year.
Description of rotation—1st year, fallow; 2nd year, rye; 3rd year, wheat; 4th year, oats; 5th year, barley.

Crop year—1920

Rotation Year	Crops: Last Year	Crops: This Year	Area	Items of Expense in Raising Crop: Rent and Manure	Seed, Twine and use of Machinery	Manual Labour: Hours Manual Labour	Manual Labour: Cost of Manual Labour	Horse Labour (including Teamster): Hours: Single Horse	2 Horse Team	3 Horse Team	4 Horse Team	Value of Horse Labour	Cost of Threshing	Total Cost	Cost for 1 Acre	Cost for 1 Bushel	Cost for 1 Ton	Height of Stubble	Particulars of Crop: Weight: Grain	Straw	Hay	Hoed Crop	Total Value	Value of Crop per Acre	Profit or Loss per Acre
			Ac.	$ c.	$ c.	No.	$ c.	No.	No.	No.	No.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	Ins.	Lb.	Lb.	Lb.	Lb.	$ c.	$ c.	$ c.
4	Wheat	Oats	5	20 00	16 20	3½	1 40				8½	8 50	21 60	67 70	13 54	0 38		4	6,120				117 0	23 40	+ 9 86
5	Oats	Barley	5	20 00	16 68	3½	1 40				22	22 00	10 29	71 00	14 20	0 84		4	4,032				71 40	14 28	+ 0 08
1	Barley	Fallow	5	20 00	5 00						30½	30 50		55 50	11 10										− 11 10
2	Fallow	Rye-Wheat*	5	20 00	29 20	3½	1 40				21½	21 50	8 25	80 35	16 07	1 46		5	3,300				124 85	24 97	+ 8 90
3	Rye	Wheat	5	20 00	21 20	3½	1 40				21½	21 50	7 05	71 15	14 23	1 51		5	2,820				106 69	21 33	+ 7 10
Aggregate														345 70									419 94		
Average per acre, 1920														13 82									16 79		2 97

* Rye winter killed, and re-sown to wheat.

ROTATION RECORD

Station—Rosthern

Rotation—J — Crop year—1920

Description of rotation—1st year, fallow; 2nd year, wheat; 3rd year, wheat; 4th year, oats, seeded down; 5th year, hay; 6th year, hay.

Rotation Year	Crops: Last Year	Crops: This Year	Area	Items of Expense in Raising Crop: Rent and Manure	Seed, Twine and use of Machinery	Manual Labour: Hours Manual Labour	Manual Labour: Cost of Manual Labour	Horse Labour (including Teamster): Hours: Single Horse	2 Horse Team	3 Horse Team	4 Horse Team	Value of Horse Labour	Cost of Threshing	Total Cost	Cost for 1 Acre	Cost for 1 Bushel	Cost for 1 Ton	Height of Stubble	Particulars of Crop: Weight: Grain	Straw	Hay	Hoed Crop	Total Value	Value of Crop per Acre	Profit or Loss per Acre
			Ac.	$ c.	$ c.	No.	$ c.	No.	No.	No.	No.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	Ins.	Lb.	Lb.	Lb.	Lb.	$ c.	$ c.	$ c.
		2nd year hay	12	48 00	12 00	.....	.....	.....	.....	.....	5·2	52 00	.....	112 00	9 33	.....	.....	.....	.....	.....	.....	.....	.....	.....	− 9 32
		Fallow	12	48 00	12 00	.....	.....	.....	.....	.....	4·7	47 00	.....	107 00	8 92	.....	.....	.....	.....	.....	.....	.....	.....	.....	− 8 93
		Wheat	12	48 00	50 88	8	3 20	.....	.....	.....	4·7	47 00	30 10	179 18	14 93	0 90	.....	5	12,038	.....	.....	.....	455 48	37 95	+ 23 02
		Wheat	12	48 00	49 57	8	3 20	.....	.....	.....	4·7	47 00	19 35	167 12	13 92	1 30	.....	5	7,740	.....	.....	.....	302 83	25 24	+ 11 32
		Oats seeded	12	48 00	68 40	8	3 20	.....	.....	.....	20·0	20 00	28 56	168 16	14 01	0 71	.....	5	8,092	.....	.....	.....	154 70	12 89	− 1 12
		1st year hay	12	48 00	68 40	8	3 20	.....	.....	.....	38·5	38 50	67 08	225 18	18 76	0 40	.....	5	19,006	.....	.....	.....	363 35	30 28	+ 11 52
Aggregate			....	288 00	261 25	.....	12 80	.....	.....	.....	251·50	145 09	958 64	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1,276 36	.....	
Average per acre, 1920			....	4 00	3 63	.....	0 18	.....	.....	.....	3·49	2 01	13 31	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	17 73	.....	4 42

There was no yield of hay. The field of 2nd year hay yielded nothing. The field for first year hay was sown to oats and grass-seed and yielded a crop of oats.

ROTATION RECORD

Station—Rosthern

Rotation—J Crop year—1920

Description of rotation—1st year, fallow; 2nd year, wheat; 3rd year, wheat; 4th year, oats, seeded down; 5th year, hay; 6th year, hay.

Rotation Year	Crops: Last Year	Crops: This Year	Area	Items of Expense in Raising Crop: Rent and Manure	Seed, Twine and use of Machinery	Manual Labour: Hours Manual Labour	Manual Labour: Cost of Manual Labour	Horse Labour (including Teamster): Hours: Single Horse	2 Horse Team	3 Horse Team	4 Horse Team	Value of Horse Labour	Cost of Threshing	Total Cost	Cost for 1 Acre	Cost for 1 Bushel	Cost for 1 Ton	Height of Stubble	Particulars of Crop: Weight: Grain	Straw	Hay	Hoed Crop	Total Value	Value of Crop per Acre	Profit or Loss per Acre
			Ac.	$ c.	$ c.	No.	$ c.	No.	No.	No.	No.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	Ins.	Lb.	Lb.	Lb.	Lb.	$ c.	$ c.	$ c.
4	Wheat	Oats seeded down*	5	20 00	20 30	3½	1 40				8½	8 50	24 36	74 56	14 91	0 37		5	6,902				131 95	26 39	+ 11 48
5	Oats seeded down	Oats seeded down*	5	20 00	20 06	3½	1 40				22	22 00	18 72	82 18	16 43	0 53		5	5,304				101 40	20 28	+ 3 85
6	Hay	Hay	5	20 00	5 00				5½		16	20 12		45 12	9 02		23 25				3,880		23 28	4 66	− 4 36
1	Hay	Fallow	5	20 00	5 00				7½		22½	28 12		53 12	10 62		25 41				4,180		25 08	5 01	− 5 61
2	Fallow	Wheat	5	20 00	21 20	3½	1 40				8½	8 50	6 75	57 85	11 57	1 28		5	2,700				102 15	20 43	+ 8 86
3	Wheat	Wheat	5	20 00	21 20	3½	1 40				8½	8 50	8 10	59 20	11 84	1 10		5	3,240				122 58	24 52	+ 12 68
Aggregate														372 03									506 44		
Average per acre, 1920														13 40									16 88		3 48

* Grass did not catch; re-sown to oats and grass

ROTATION RECORD

Rotation—D | Station—Rosthern | Crop year—1920

Description of rotation, 1st year, fallow; 2nd year, wheat; 3rd year, wheat; 4th year, fallow; 5th year, roots; 6th year, barley seeded down; 7th year, hay; 8th year, hay.

Rotation Year	Crops: Last Year	Crops: This Year	Area	Items of Expense in Raising Crop: Rent and Manure	Seed, Twine and use of Machinery	Manual Labour: Hours Manual Labour	Manual Labour: Cost of Manual Labour	Horse Labour (including Teamster): Hours: Single Horse	2 Horse Team	3 Horse Team	4 Horse Team	Value of Horse Labour	Cost of Threshing	Total Cost	Cost for 1 Acre	Cost for 1 Bushel	Cost for 1 Ton	Height of Stubble	Particulars of Crop: Weight: Grain	Straw	Hay	Hoed Crop	Total Value	Value of Crop per Acre	Profit or Loss per Acre
			Ac.	$ c.	$ c.	No.	$ c.	No.	No.	No.	No.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	Ins.	Lb.	Lb.	Lb.	Lb.	$ c.	$ c.	$ c.
	Wheat	Fallow	5	34 06	5 00					28½		28 50		67 56	13 51										— 13 51
	Fallow	Roots	5	34 06	15 00	120	48 00	20	18	3		29 00		71 36	14 27		1 47					96,925	339 24	67 85	+ 54 34
	Roots	Barley seeded	5	34 06	26 50	4½	1 80			9		9 00	17 68	89 04	17 81	0 67		5	7,344				115 60	23 12	+ 5 31
7	Barley seeded	Hay	5	34 06	25 06	3½	1 40			20½		20 50	11 57	92 60	18 52	1 04		4	48 06				75 65	15 13	— 3 39
8	Hay	Hay	5	34 06	5 00				5½	17		21 12		60 18	12 03		15 53				7,750		46 50	9 30	— 2 73
1	Hay	Fallow	5	34 06	5 00				5½	19		23 12		62 18	12 43		1 31				6,291		37 74	7 55	— 4 88
2	Fallow	Wheat	5	34 06	21 44	3½	1 40		3	21		23 25	7 65	87 80	17 56			5	3,060				115 77	23 15	+ 5 59
3	Wheat	Wheat	5	34 06	21 44	3½	1 40		4	22		25 00	9 00	90 91	18 18			5	3,600				136 20	27 24	+ 9 06
Aggregate														621 63									866 70		
Average per acre, 1920														15 54									21 69		6 15

The field recorded as fallow following hay was not ploughed till after a crop of hay was cut, which, in the table, reduces the cost of fallowing, but which is almost sure to react on the wheat crop of 1920 to be taken from this field.

The field recorded as first-year hay was seeded in 1919, but the grass seed did not grow, and it was re-seeded to grass with a nurse crop of barley in 1920...

ROTATION RECORD

Rotation—R | *Station*—Rosthern | Crop year—1920

Description of rotation—1st year, fallow; 2nd year, wheat; 3rd year, oats seeded down; 4th year, 1st year hay; 5th year, 2nd year hay; 6th year, fallow; 7th year, sunflowers; 8th year, wheat; 9th year, oats.

Rotation Year	Crops		Area	Items of Expense in Raising Crop														Particulars of Crop						
						Manual Labour		Horse Labour (including Teamster)										Weight						
								Hours																
	Last Year	This Year		Rent and Manure	Seed, Twine and use of Machinery	Hours Manual Labour	Cost of Manual Labour	Single Horse	2 Horse Team	3 Horse Team	4 Horse Team	Value of Horse Labour	Cost of Threshing	Total Cost	Cost for 1 Acre	Cost for 1 Bushel	Cost for 1 Ton	Height of Stubble	Grain	Straw	Hay	Hoed Crop	Total Value	Value of Crop per Acre	Profit or Loss per Acre
			Ac.	$ c.	$ c.	No.	$ c.	No.	No.	No.	No.	$ c.	$ c.	$ c.	$ c.	$ c.	$ c.	Ins.	Lb.	Lb.	Lb.	Lb.	$ c.	$ c.	$ c.
4	Wheat	Oats	5	22 00	16 92	3½	1 40				18½	18 25	28 14	86 71	17 34	0 37		5	7,973	4,100			160 62	32 12	+ 14 78
5	Oats	Fallow	5	22 00	5 00						20	20 00		47 00	9 40										− 9 40
6	Fallow	Wheat	5	22 00	21 32	3½	1 40				11	11 00	10 80	66 52	13 30	0 92		5	4,320	4,600			168 04	33 60	+ 20 30
7	Wheat	Oats seeded down.	5	22 00	18 16	3½	1 40				10	10 00	26 76	78 32	15 66	0 35		5	7,582	5,000			153 95	30 79	+ 15 13
8	Oats seeded down	Hay seeded down*	5	22 00	18 16	3½	1 40				21	21 00	16 56	79 12	15 82	0 57		5	4,692	3,950			97 60	19 52	+ 3 70
9	1st year hay	Hay	5	22 00	5 00				5½		17	21 12		48 12	9 62		26 01				3,700		22 20	4 44	− 5 18
1	2nd year hay	Fallow	5	22 00	5 00						20½	20 50		47 50	9 50										− 9 50
2	Fallow	Sunflowers	5	22 00	17 73	25	10 00	32	3½	11	3	35 25		84 98	16 99		2 68					63,291	221 52	44 30	+ 27 31
3	Sunflowers	Wheat	5	22 00	21 68	3¼	1 40				22	22 00	16 83	83 91	16 78	0 74		5	6,732	4,000			256 69	51 34	+ 34 56
Aggregate														622 18									1,080 62		
Average per acre, 1920														13 82									24 01		10 19

* No catch of grass. and re-sown to oats and grass.

FORAGE CROPS

INDIAN CORN

Owing to the frequent failures Indian corn has ceased to be depended upon as a field crop at this Station. Seven varieties were grown in plots with the following results:—

INDIAN CORN

Date of sowing.....May 20, 1920
Date of cutting.....September 13, 1920

Variety	Stage	Height	Yield	
			tons	lbs.
Longfellow	Silk	6′ 0″	9	450
Ewing's Yellow Dent	Boiling	5′ 6″	9	351
Crompton's Early	Early silk	5′ 6″	9	351
McConnel's Yellow Dent	Late milk	5′ 3″	8	1,210
Mitchell's Pride, Yellow Dent	Late milk	5′ 3″	8	974
North Western Dent	Silk	5′ 2″	8	963
Quebec No. 28	Boiling	5′ 0″	7	1645

SUNFLOWERS

Sunflowers have been grown for seed in this district by the settlers since 1891, and have usually ripened. There is no record of the number of years that the seed was frosted, but they are considered as more resistant to frost than is wheat.

In 1920 five acres that had been summer-fallowed in 1919 were sown to sunflowers on May 25 and cut on August 28, yielding 6 tons 473 pounds per acre. On May 10, two acres that had been sown to oats in 1919 were sown to sunflowers and cut on September 10, yielding 8 tons 1,290 pounds per acre. The latter had 32 days longer time of growth.

Some sunflowers were left standing in order to determine the temperature at which they would be injured. After a temperature of 26·5 they were still green and apparently unaffected.

Sunflowers were planted at different distances apart, with the following results:—

VARIETY TEST—SUNFLOWERS

Variety.....All Russian Giant
Date sown.....May 21
Date cut.....September 13
Condition when cut.....About 1 per cent in flower

Rows 30″ apart	Rows 36″ apart	Height	Yield per acre
Hoed to 8″		4′ 6″ 9	tons 422·25 lbs.
" 12″		5′ 0″ 8	" 568·86 "
" 24″		5′ 3″ 5	" 504·34 "
	Hoed to 8″	5′ 8″ 7	" 694·00 "
	" 12″	6′ 4″ 6	" 696·00 "
	" 24″	6′ 10″ 7	" 626·00 "

TURNIPS

Five acres of Hall's Westbury were grown on summer-fallow that had been manured, and yielded 9 tons 1,385 pounds per acre. The seed was sown May 20 and the roots harvested October 7.

Eight varieties were under test, with the following results:—

VARIETY TESTS—TURNIPS

Variety	Yield per acre
Yellow Aberdeen Green Top	9 tons 414 lbs.
Good Luck Fredericton	7 " 813 "
Canadian Gem Kentville	7 " 672 "
Monarch	7 " 173 "
Kentville Green Top	6 " 671 "
Champion Charlottetown	6 " 671 "
Good Luck St. Anne	6 " 220 "
Ditmars Kentville	5 " 580 "

SUGAR BEETS

Date sown, May 21.
Date dug, October 7.

VARIETY TESTS—SUGAR BEETS

Variety	Yield per acre
Kitchener	7 tons 672 lbs.
British Columbia Grown	6 " 834 "
Chatham Grown	4 " 370 "

CARROTS

Date sown, May 21.
Date dug, October 7.

COMPARISON OF YIELDS—CARROTS

Variety	Yield per acre
Danish Champion	2 tons 464 lbs.
White intermediate	3 " 975 "

GRASSES AND CLOVERS

For three years in succession there has been no catch in sowing rye grass in the rotations, and consequently in 1920 we had no hay crop.

Twenty plots each of Western Rye grass, alfalfa and sweet clover were sown in 1920, ten each with nurse crop and ten without nurse crop. Owing to the dry season, there was no catch whatever with the nurse crop, and only a very poor catch where sown alone.

BUILDINGS

During the year there was erected at the Station a pumphouse, 24 feet by 30 feet with 12-foot posts. The lower part is to be used for two pneumatic water storage tanks, each 6 feet by 24 feet, and the necessary pumping machinery. The second storey affords an excellent work room and storage for seeds.

The boarding house was plastered throughout and a new floor laid in the dining room.