DOMINION OF CANADA

DEPARTMENT OF AGRICULTURE

DOMINION EXPERIMENTAL FARMS

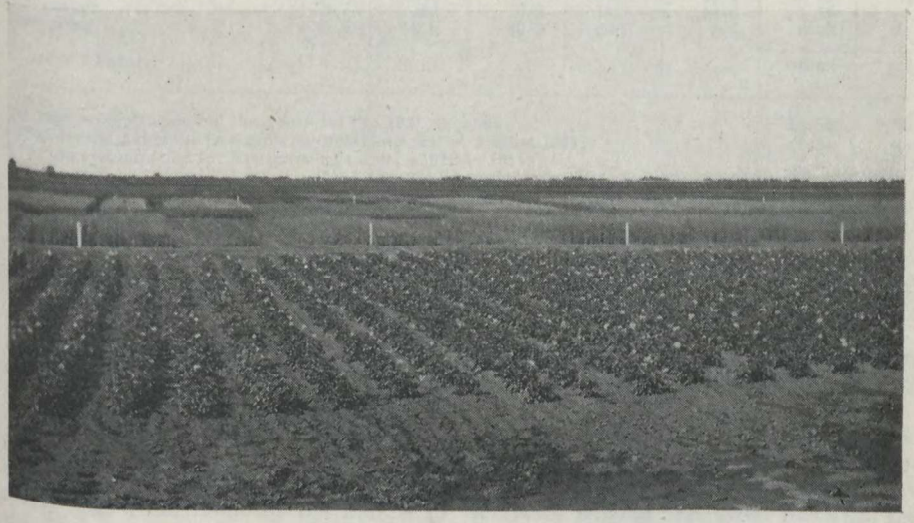
EXPERIMENTAL STATION

ROSTHERN, SASK.

REPORT OF THE SUPERINTENDENT

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

FOR THE YEAR 1921



Some of the Experimental Plots of Grain and Potatoes, 1921

Printed by authority of Hon. W. R. Motherwell, Minister of Agriculture,
Ottawa, 1922

OTTAWA
F. A. ACLAND
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1922

EXPERIMENTAL STATION, ROSTHERN, SASK.

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

SEASONAL NOTES

The season of 1921 had more rainfall than any previous season since 1912, with the maximum for one month coming in July. This assured the largest yield in grain crops since 1914. A notable feature of the season was the long period without damaging frosts; there being none recorded between May 14 and September 15.

WEATHER OBSERVATIONS TAKEN AT ROSTHERN EXPERIMENTAL STATION 1921

Month	Highest	Date	Lowest	Date	Mean	Total Precipitation	Sunshine
1921	Deg. F.		Deg. F.		Deg. F.	Inches	Hours
January	31·0	5th	28·7	17th	5·22	0·65	98·1
February	41·0	25th	32·7	19th	9·06	1·40	104·2
March	41·07	31st	27·1	12th	10·89	0·16	166·3
April	56·3	18th	3·8	9th	32·31	2·22	232·7
May	79·4	24th	28·1	14th	52·53	1·88	234·8
June	84·6	17th	41·4	4th	64·71	1·49	313·2
July	89·9	20th	44·3	25th	64·72	4·91	354·5
August	91·2	30th	36·3	20th	61·3	0·64	320·6
September	78·8	7th	30·4	15th	50·3	3·34	181·7
October	72·9	3rd	22·2	26th	42·1	0·30	167·0
November	53·7	3rd	20·9	19th	14·0	1·59	61·9
December	35·5	11th	40·2	20th	5·5	0·45	116·7
Total						19·03	2,351·7
Average precipitation for the years 1912 to 1921, inclusive						14·50	2,264·85
Total precipitation for five growing months April to August 1921						11·14	1,455·80
Average precipitation for five growing months 1912 to 1921						8·91	1,358·06

ANIMAL HUSBANDRY

FEED CONDITIONS

Although the year 1920 had not been very favourable for high yields, there was no feed shortage during the following winter, and all classes of stock came out in the spring of 1921 in fair condition.

During the summer of 1921, pasture conditions were more favourable than they had been since 1914. Two and a quarter acres of rape and the same area of oats carried sixty-three pigs and eight cows till early in August and the rape carried thirty pigs from then till the middle of October. During the three previous years the annual pasture crops were of no value.

HORSES

Horse breeding and raising in northern Saskatchewan has always been fraught with risks. Although there have always been small districts and a few farms in most districts practically free from disease, over most of the area losses have always been

incurred from abortion, navel ill, or swamp fever. Many farms escaped for a number of years in spite of poor management, and then were overtaken by disease in one form or another without any explanation being possible as to the source of the infection. When a farm or district is once infected with one of these diseases, complete eradication is a long process, even under the very best management.

Again and again farmers have said that they formerly raised colts without difficulty but that for the past few years the colts have died within a few weeks of birth; that they had no sickness in their horses till within recent years, but that since then they have lost one or two annually.

During the past season three foals on the Station were lost by abortion and three horses by swamp fever, despite the application of the best known preventatives and treatments.

There are now, December, 1921, eighteen mature horses, two rising three and two rising two years, on the Station.

WINTERING HORSES

Project No. 4a.—The usual method followed on the Station is to feed the horses half a gallon of mixed oats and bran and some sheaf oats or hay and turn them out for the day in a large field with access to a straw stack. The evening meal is the same as the morning meal. There are methods in vogue using less feed, but, fed as above, the horses came out in the spring in fair flesh and with good mettle.

BEEF CATTLE

FEEDING SUNFLOWERS

Project 1.—An attempt was made in the winter of 1920-21 to arrive at the value of sunflower ensilage in feeding steers. Two lots of steers of ten each were fed oat and barley meal and oat straw, and one lot was fed ensilage in addition. The straw fed to the lot having ensilage was eleven pounds per steer per day and to the other lots 19 pounds The meal ration was 6 pounds from December 14 to January 29, then 8 pounds to April 16, 12 pounds to April 30, and 15 pounds to May 19. Lot 1 was fed ensilage at 12 pounds per steer per day from December 14 to December 25 and 24 pounds per day for the balance of the period. There was no difference in the weights of the two lots until the middle of February, but by March 12, lot 1 weighed 126 pounds more than lot 2. At the end of the feeding period, the lot fed ensilage weighed 430 pounds more than the lot fed straw. It must be remembered that the oat straw was very choice and had not been rained on. It was fed cut and mixed with the meal. Following is the statement of results:—

STEER FEEDING EXPERIMENT

	Lot 1	Lot 2
No. steers in experiment	10	10
No. days in experiment	155	155
Total weight at beginning	10,114 lbs.	10,115 lbs.
Total weight at end	12,690 "	12,260 "
Gain during period	2,576 "	2,145 "
Gain per head	257.6 lbs.	214.5 lbs.
Daily gain per head	1.66 "	1.38 "
Amount meal eaten per lot	13,140 lbs.	13,140 lbs.
" oat straw eaten per lot	13.310 "	22,990 "
" hay eaten per lot	3,850 "	6,650 "
" sunflower eaten per lot	35,880 "	.....

From the above table it will be seen that 35,880 pounds ensilage, even though frozen, was equivalent to 2,630 pounds meal, plus 14,278 pounds of very choice oat straw, plus 4,130 pounds hay. If the valuations of meal $30, straw $5, and hay $15 per ton were used as a basis of calculation, then the frozen sunflower ensilage would be worth $6.02 per ton fed in the above manner.

Although this appears to be a low valuation, and is the result of only one experiment, even so there would appear to be a place for such a crop as a cleaning crop on dirty land, as a substitute for summer fallow and as a source of roughage, especially to meet those years when grains are expensive or straw and hay difficult to procure.

Twenty steers were bought in the Prince Albert stock yards in November, 1920, for experimental feeding.

DEHORNING

Project No. 49.—Fifteen of these steers were horned and five were muleys. Previous feeding experiments on the Station had shown that unless horned steers have more room than otherwise necessary, and unless the feed is well spread, all do not get a fair share. Nevertheless, dehorning has a detrimental effect for the first few weeks, as noted in previous tests. Following is the result with the above-mentioned lots:—

November 29—Weight 15 horned steers	15,222	lbs.
" 5 muley steers	5,000	"

The fifteen were dehorned and were all run together and fed five pounds of meal per steer per day and weighed again in two weeks.

December 14—Weight of 15 dehorned steers	15,080	lbs.
" " 5 muley steers	5,240	"
Grain per muley steer	48	"
Loss per dehorned steer	10	"
Difference in gain per steer in fourteen days	58	"

SHRINKAGE IN SHIPPING STEERS

Project No. 50.—One lot of sixty-eight steers purchased in Turtleford in 1916 and on the train for one day suffered an average shrinkage of 57 pounds, without feed and water. One lot purchased in Melfort in 1917 and on the train for one day lost an average of 57·25 pounds per steer, without feed and water. One lot purchased in Prince Albert in 1920 and on the train for about twelve hours lost 57·22 pounds per steer, without feed and water. One lot in 1921, weighed at the feeding corrals and shipped to Winnipeg, lost 57 pounds per steer in transit after being on the train three days and fed and watered.

It would appear that the greatest shrinkage is in the first twelve hours, and that it does not vary far from 57 pounds per head, whether for one day or two days.

DAIRY CATTLE

Project 2.—The herd of pure-bred Holstein-Friesian cattle in increasing very satisfactorily. From a beginning of two heifer calves in 1914, there are now on the Station fifteen pure-bred females, seven of which are in milk. Six are in the R.O.P. test and following is a table of their yields since last freshening to the end of December, 1921:—

MILK YIELDS

Name	Age at freshening		Date of freshening	Yield of milk to Dec. 31, 1921, in pounds
	yrs.	days		
R.E.S. Madrigal Gypsy Keyes	3	329	Mar. 19, 1921.	15,682·9
R.E.S. Johanna Gypsy Keyes	2	10	April 6, 1921.	11,180·3
R.E.S. Johanna Sylvia	2	224	April 7, 1921.	11,965·0
R.E.S. Madrigal Sylvia	3	208	April 16, 1921.	10,801·3
R.E.S. Sarcastic Sylvia	5	54	June 6, 1921.	9,944·7
Bonnieview Oypsy Keyes	7	92	July 20, 1921.	8,663·7

During their lactation period, these cows were fed meal at the rate of one pound to three and a half pounds of milk yield. The yield of milk one week was made the basis for the amount of meal fed for the next week.

The meal was made up of oat chop 3 parts, bran 3 parts, oil cake meal 2 parts, and barley chop 1½ parts.

The feed consumed during the milking periods to December 31 was turnips 40,550 pounds, green oats 12,165 pounds and meal 19,496 pounds.

While on pasture from the middle of May to the end of September they were fed no turnips.

SHEEP

Projects 5 to 7.—The flock of sheep was reduced to fifty breeding ewes and one ram, and, from these, fifty-two lambs were raised to maturity. From these were sold, by December 31st, 465 pounds wool, 570½ pounds of mutton and 1,431 pounds lamb and there is left a flock of fifty ewes and ewe lambs.

The question is often asked as to the most profitable means of disposing of the surplus stock, and the usual method in districts where sheep are plentiful is to ship them to a large central market. But in northern Saskatchewan not many sheep are raised and the local demand for mutton is greater than the supply. As a consequence, for six years the Winnipeg price has been realized by dressing the surplus sheep on the Station and selling them locally, thereby saving shipping expenses.

SWINE

Projects 8 and 9.—For two years an attempt has been made to compare rape and oat pasture for pigs. In 1920, the season was such that there was no pasture on either plot, but in 1921, on the same plots, 2½ acres each, there was sufficient pasture for sixty-three pigs and eight cows until the first of August, when the oats gave out. The 2½ acres of rape continued to supply sufficient pasture for thirty pigs until past the middle of October.

Following is a table of feeds and gains:—

PASTURE EXPERIMENT WITH SWINE

Kinds of pasture	Rape	Oats
	acres	acres
Size of pasture	2½	2½
Number pigs in lot	30	30
	lb.	lb.
Weight June 24	1,071	1,102
Weight Nov. 3	5,130	4,609
Gross gain per lot	4,059	3,507
Average gain per pig	132	117
Feed consumed—		
Ground oats	4,631	4,631
Ground barley	7,766	7,766
Shorts	3,325	3,325
Milk	1,225	1,225
Pounds meal for one pound gain	3·8	4·5

A lot of pigs fed similarly in 1920, but without pasture, required 5·73 pounds meal for one pound of gain.

FIELD HUSBANDRY

Due to a heavy snowfall and backward spring, seeding did not commence in the fields until the second week in May. Wheat was seeded in good time, but, as most of the oat and barley land had to be ploughed, seeding was not completed until June 8. All the work was done by horses, with the exception of three days' ploughing with the tractor for oats and barley.

The total production of grain and feed from the Station fields in 1921 was:—

Wheat	1,963	bushels
Oats	6,906	"
Barley	2,257	"
Rye	196	"
Sunflowers	120 tons	748 lbs.
Sheaf oats	150	"
Turnips	70 "	1,864 "

A COMPARISON OF DIFFERENT ROTATIONS

Projects 22 to 26.—The rotations all showed substantial profits in the following order:—

Rotation J2	$9 60 per acre
" P	8 77 "
" R	7 31 "
" 5 years	6 15 "
" J	4 50 "

No hay crop was secured on any of the rotations. Oats and barley were grown on plots where the grass did not catch. Rotation J2 differs from J by putting wheat after two years in hay instead of after fallow, and sunflowers after wheat. The remainder of the rotation is the same as J.

	Rotation J	Rotation J2
1st year	Fallow	Wheat
2nd "	Wheat	Sunflower
3rd "	Wheat	Wheat
4th "	Oats seeded down	Oats seeded down
5th "	Hay	Hay
6th "	Hay	Hay

Harvesting was completed in good time and before any injurious frosts. Crops were the best in the district since 1914. Some were affected slightly by rust, but the damage on the whole was trifling. Rain and snow from September 9 to 13 damaged all unthreshed grain. Heat after the rain caused sprouting, which in turn lowered the grade of the unthreshed wheat. Dry weather after this made it possible to get all threshing done before freeze-up.

A scale of cost and return values was drawn up as nearly equal to those of current prices as possible. The actual cost of labour was charged. Return values for grain were based on the average price between the time threshing commenced and November 12. The values by which the following tables were compiled are as follow:—

COST AND RETURN VALUES—1921

Statement of Return Values

	1920	1921
Wheat (from the machine) per bush.	$ 2 27	$1 00
Barley (from the machine) "	85	41
Oats (from the machine) "	65	30
Rye (from the machine) "	..	85
Western rye grass hay per ton	12 00	7 00
Oat straw "	4 00	2 00
Wheat "	1 00	1 00
Barley "	1 00	2 00
Sunflowers "	7 00	7 00
Turnips "	7 00	7 00

COST AND RETURN VALUES, 1921.—*Concluded*

STATEMENT OF COST VALUES

		1920		1921
Rent	per acre	$ 4 00		$2 00
Barnyard manure spread on fields (charged equally over all years of the rotation)	per ton	1 50		1 00
Seed wheat	per bush.	2 50		2 25
Seed oats	"	1 00		1 00
Seed barley	"	1 50		1 50
Seed rye	"	1 60		2 00
Seed turnip	per lb.	1 00		1 00
Seed sunflowers	"	25		25
Seed western rye grass	"	11½		11½
Machinery	per acre	1 00		1 00
Horse labour (including teamster)—			Summer	Fall
Single horse	per hour	62½	42	54
Two-horse team	"	75	54	66
Three-horse team	"	87½	66	78
Four-horse team	"	1 00	78	90
Manual labour	"	50	30	42
Threshing—				
Wheat	per bush.	15		15
Oats	"	12		12
Barley	"	13		13
Rye	"	15		15
Twine	"	24		24

NOTE.—These values are based on prices which prevailed in this district.

ROTATION RECORD—FIVE-YEAR (FALLOW, RYE, WHEAT, OATS, BARLEY)

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
5	Oats	Barley	5	10 00	24 80	6	2·52	.....	.....	.....	18.0	14 40	24 70	76 42	15 28	0 40	.....	5	9,120	10,078	.....	.....	87 90	17 58	2 30
1	Barley	Fallow	5	10 00	5 00	.....	.....	.....	.....	.....	22.0	17 52	.....	32 52	6 50	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 50
2	Fallow	Rye	5	10 00	23 84	5	2 10	.....	.....	.....	8.0	6 60	25 95	69 49	13 69	0 39	.....	5	9,698	16,242	.....	.....	155 17	31 03	17 34
3	Rye	Wheat	5	10 00	21 94	4	1 68	.....	.....	.....	22.0	17 52	18 30	67 76	13 55	0 56	.....	5	7,320	11,210	.....	.....	127 60	25 50	11 95
4	Wheat	Oats	5	10 00	18 12	4	1 68	.....	.....	.....	22.0	17 52	39 72	87 04	17 41	0 26	.....	5	11,254	16,471	.....	.....	115 30	23 06	5 65
Aggregate			.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	66 43	.....	.....	.....	.....	.....	.....	.....	.....	.....	30 74
Average per acre. 1921			.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	13 29	.....	.....	.....	.....	.....	.....	.....	.....	.....	6 15

ROTATION RECORD—J—SIX-YEAR (FALLOW, WHEAT, WHEAT ,OATS, HAY, 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.
6	Hay	Fallow	12	24 00	12 00						49	38 22		74 22	6 18										6 18
1	Fallow	Wheat	12	24 00	46 20	12	5 04				20	16 56	49 65	141 45	11 78	42		5	19,860	24,715			343 50	28 62	16 84
2	Wheat	Wheat	12	24 00	45 00	12	5 04				53	42 30	40 35	156 69	13 05	66		5	14,140	26,155			248 73	20 73	7 69
3	Wheat	Oats S.D.	12	24 00	63 00	10	4 20				51	40 62	70 56	202 38	16 86	34		5	19,992	30,558			206 40	17 20	0 34
4	Oats S.D.	Oats S.D.	12	24 00	63 48	10	4 20				43	34 44	70 32	196 44	16 37	33		5	19,924	35,596			210 80	17 56	1 19
5	Oats S.D.	Oats	12	24 00	44 64	12	5 04				36	33 38		107 06	8 92		3 89				54,980		192 50	16 04	7 12
Aggregate															73 16										27 00
Average per acre 1921															12 19										4 50

ROTATION RECORD—J2—SIX-YEAR (SUNFLOWERS, WHEAT, OATS, HAY, HAY, WHEAT)

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	Oats S.D.	Oats S.D.	5	10 00	26 61	4	1 68	.....	.....	.....	18	14 40	26 88	79 57	15 91	0 35	.....	5	7,616	13,184	.....	.....	80 68	16 13	0 22
5	Oats S.D.	Oats	5	10 00	20 62	4·5	1 89	.....	.....	.....	18	14 40	27 60	74 51	14 90	0 32	.....	5	7,820	14,890	.....	.....	83 89	16 77	1 89
6	Hay	Wheat	5	10 00	24 75	4	1 68	.....	.....	.....	8	6 60	18 00	61 03	12 20	0 51	.....	5	7,200	8,700	.....	.....	124 35	24 87	12 67
1	Fallow	Sunflower	5	10 00	14 73	217	65 10	.....	5·5	10	16·5	23 64	.....	113 47	22 69	.....	3 15	.....	.....	.....	.....	72,420	253 47	50 69	28 00
2	Wheat	Wheat	5	10 00	22 66	4	1 68	.....	.....	.....	22	17 52	19 05	70 91	14 18	0 55	.....	5	7,620	12,515	.....	.....	133 25	26 65	12 47
3	Wheat	Oats S.D.	5	10 00	26 85	4·5	1 89	.....	.....	.....	22	17 52	35 40	91 66	18 33	0 31	.....	5	10,030	14,845	.....	.....	103 63	20 72	2 39
Aggregate			.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	98 21	.....	.....	.....	.....	.....	.....	.....	.....	.....	57 62
Average per acre 1921			.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	16 36	.....	.....	.....	.....	.....	.....	.....	.....	.....	9 60

ROTATION RECORD—P—EIGHT-YEAR (FALLOW, WHEAT, WHEAT, TURNIPS, BARLEY, HAY, PASTURE)

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.
5	Fallow	Turnips	5	19 37	11 00	120	40 80	.....	23·5	.....	2·5	16 20	.....	87 37	17 47	.....	1 43	.....	.....	.....	.....	122543	428 89	85 78	68 31
6	Turnips	Barley S.D.	5	19 37	33 77	6	2 52	.....	.....	.....	22·0	17 52	38 35	111 53	22 31	0 37	.....	5	14,160	11,120	.....	.....	132 07	26 41	4 10
7	Barley S.D.	Barley S.D.	5	19 37	33 05	5	2 10	.....	.....	.....	18·0	14 40	29 90	98 82	19 76	0 43	.....	5	11,040	11,560	.....	.....	105 30	21 06	1 30
8	Barley S.D.	Barley	5	19 37	24 80	5	2 10	.....	.....	.....	18.0	24 40	22 49	93 16	18 63	0 53	.....	5	8,304	12,959	.....	.....	83 93	16 78	1 85
1	2nd yr. hay	Fallow	5	19 37	5 00	.....	.....	.....	.....	.....	22.5	17 45	.....	41 82	8 36	.....	.....	.....	.....	.....	.....	.....	.....	.....	8 36
2	Fallow	Wheat	5	19 37	24 91	4	1 68	.....	.....	.....	8.0	6 60	17 10	69 66	13 93	0 61	.....	5	6,840	12,970	.....	.....	120 50	24 10	10 17
3	Wheat	Wheat	5	19 37	25 15	4	1 68	.....	.....	.....	22.0	17 52	15 30	79 02	15 80	0 78	.....	5	6,120	9,620	.....	.....	106 81	21 36	5 56
4	Wheat	Fallow	5	19 37	5 00	.....	.....	.....	.....	.....	26.5	20 67	.....	45 04	9 01	.....	.....	.....	.....	.....	.....	.....	.....	.....	9 01
Aggregate			....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	125 27	.....	.....	.....	.....	.....	.....	.....	.....	.....	70 22
Average per acre 1921			....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15 65	.....	.....	.....	.....	.....	.....	.....	.....	.....	8 77

ROTATION RECORD—R—NINE-YEAR (FALLOW, WHEAT, OATS, HAY, HAY, FALLOW, SUNFLOWERS, WHEAT, OATS).

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.
5	Oats	Fallow	5	18 30	5 00						23·5	18 33		41 63	8 33										8 33
6	Fallow	Wheat	5	18 30	21 18	4	1 68				8·0	6 60	25 50	73 26	14 65	0 43		5	10,200	17,977			179 00	35 80	21 15
7	Wheat	Oats S.D	5	18 30	26 61	4	1 68				22·0	17 52	40 20	104 30	20 86	0 31		5	11,390	14,230			114 50	22 90	2 04
8	Oats S.D	Oats S.D	5	18 30	26 85	4·5	1 89				18·0	14 40	38 32	99 76	19 95	0 42		5	8,024	12,096			82 80	16 56	3 39
9	Oats S.D	Oats	5	18 30	17 88	4	1 68				18·0	14 40	27 48	79 74	15 95	0 34		5	7,786	11,614			80 70	16 14	0 19
1	Hay	Fallow	5	18 30	5 00						21·0	16 38		39 68	7 93										7 93
2	Fallow	Sunflower	5	18 30	20 47	215·5	64 65		5·5	10	2·5	12 72		116 14	23 23		2 42					96·857	339 00	67 80	44 57
3	Sunflower	Wheat	5	18 30	21 94	4	1 68				22·0	17 52	21 30	80 74	16 15	0 57		5	8,520	13,430			148 71	29 74	13 59
4	Wheat	Oats	5	18 30	18 36	4	1 68				22·0	17 52	42 24	98 10	19 62	0 28		5	11,968	12,408			117 60	23 52	3 90
Aggregate															146 67										65 79
Average per acre 1921															16 29										7 31

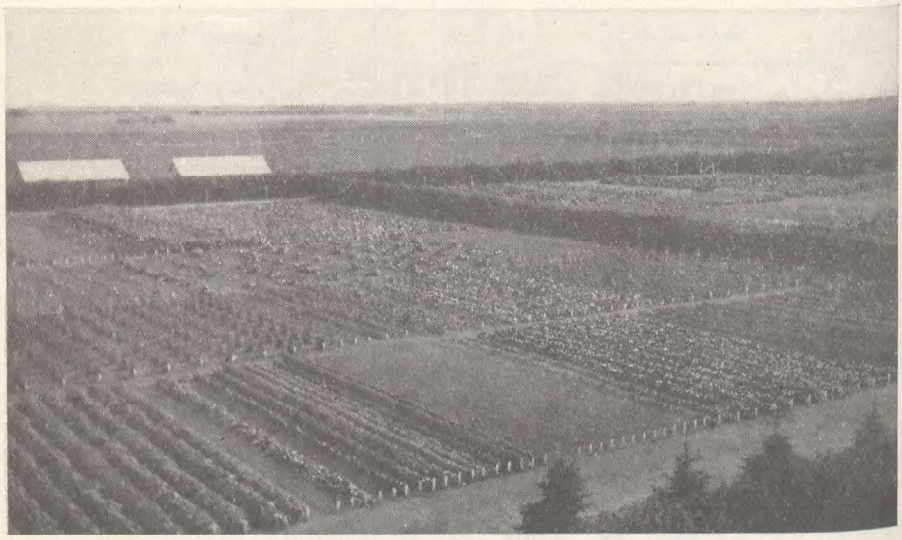
HORTICULTURE

The marked feature of the season of 1921 from the standpoint of horticulture was the long period without killing frost, May to September. There was sufficient moisture to ensure good growth, and the moisture was so well distributed that the lawns were continually green from spring until fall.

VEGETABLE CULTURE

BEANS—VARIETY TEST

Project No. 51.—In addition to the variety test, a comparison was made of yields from seed obtained from Canadian seed firms vs. matured on the Station. The following table shows the date they were ready for use; with yields of fifteen varieties from commercial seed and eleven from seed matured on the Station in 1920. The



Part of vegetable garden, 1921.

seed was sown in the open on May 18 and 19 in rows 30 inches apart. No green beans were picked from the rows set apart for seed production and none were allowed to ripen on the rows for green beans.

VARIETY TESTS WITH BEANS

Variety	Date ready for use	Yield from 30 ft. rows					
		Commercial		Ready for use	Home Grown		
		Green	Ripe		Green	Ripe	
		lb. oz.	lb. oz.		lb. oz.	lb. oz.	
Refugee or 1,000 to 1 (Carter)	Aug. 10	11 2	3 0				
Ex. Ey. Valentine	July 22	33 11	3 0	July 23	18 0	3 12	
Round Pod Kidney Wax	Aug. 17	7 11	3 8	" 23	19 12	2 4	
Bountiful Bush	July 22	37 15	3 0	" 18	5 7	2 4	
Stringless Green Pod (Burpee)	" 22	39 14	3 8	" 23	7 5	2 4	
Stringless Green Pod (Rennie)	" 25	25 1	1 8				
Kentucky Wonder Wax	Aug. 15	18 0	2 8				
Hodson Long Pod	" 19	19 11	3 8				
Masterpiece	July 22	43 0	3 0	" 18	15 8	3 0	
Plentiful French	" 22	37 4	3 8				
Wardwell Kidney Wax	" 18	36 7	4 0	" 23	25 4	3 0	
Davis White Wax	" 22	37 11	2 8	" 18	7 2		
Pencil Pod Black Wax	" 22	35 8	4 0	" 18	8 3	2 4	
Refugee (Bruce)	" 26	3 0					
Hidatsa	Aug. 15	22 11	4 0				
Yellow Eye	.....	.....	.....	" 18	18 10	3 12	
Vermont	.....	.....	.....	" 18	7 8		
Grennell's Rustless Wax	.....	.....	.....	" 18	27 3	3 12	

BEANS—CULTURAL TEST

Project No. 51a.—To determine a satisfactory way of extending the season for green beans, four varieties were sown in the open on May 18, and, as a matter of comparison, four successive sowings of Round Pod Kidney Wax were made at intervals of one week. Results were as follows:—

SUCCESSION OF SOWINGS v. DIFFERENT VARIETIES

Variety	Date ready for use	Number of pickings	Length of Season	Yield from 30 ft. rows
				lb. oz.
Round Pod Kidney Wax	July 21	5	26 days	19 14
Stringless Green Pod	" 21	2	23 "	24 10
Extra Early Valentine	" 21	2	26 "	8 9
Refugee or 1,000 to 1	" 28	2	27 "	25 14
Round Pod Kidney Wax—				
Sown on May 18	" 21	5	26 "	19 14
" May 25	" 21	4	34 "	20 14
" June 1	" 28	3	27 "	25 4
" June 8	Aug. 10	3	15 "	16 2

BEETS—VARIETY TEST

Project No. 52.—Ten varieties of beets were under test. These were all sown on May 18 and all varieties were ready for use on July 15 but were not harvested until the last of September. A great many of these beets were too large and coarse for table use and are listed in the following table as "unmarketable." The rows were 30 inches apart.

VARIETY TEST WITH BEETS

Variety	Yield from 30-foot row					
	Unmarketable		Marketable		Total	
	lb.	oz.	lb.	oz.	lb.	oz.
Crosby Egyptian	73	0	36	0	109	0
Detroit Dark Red	54	0	14	0	68	0
Early Wonder	112	0	13	0	125	0
Eclipse	97	0	13	0	110	0
Crimson Globe	93	0	41	0	134	0
Extra Early	100	0	13	0	113	0
Black Red Ball	82	0	19	0	101	0
Detroit Dark Red	82	0	17	0	99	0
New Dandy	108	0	14	0	122	0
Early Model	79	0	28	0	107	0

These results indicate that, in this district, in a season when there is abundant moisture as was the case in 1921, it would be advisable to use the early sowing of beets during the summer and make a later sowing to have beets for table use during the winter.

BEET—THINNING EXPERIMENT

Project 52a.—Seed of the Detroit Dark Red variety was sown on May 18 and were ready for use on July 15. This experiment was conducted to learn the best distance of thinning the young plants. The rows were 30 inches apart and 30 feet long. These were harvested at the end of September and a great many were too large and coarse for table use and are listed below as "unmarketable."

THINNING EXPERIMENT WITH BEETS

Distances apart in rows	Yield from 30-foot row					
	Unmarketable		Marketable		Total	
	lb.	oz.	lb.	oz.	lb.	oz.
2 inches	61	0	38	0	99	0
3 inches	84	0	11	0	95	0
4 inches	112	0	4	0	116	0

BRUSSELS SPROUTS—VARIETY TESTS

Project No. 53.—Four varieties were sown in the hot-bed on April 19 and transplanted to the open May 26. They were harvested October 10 with the following yields from twenty average stalks:—

Variety	Yield	
	lb.	oz.
Dalkeith	5	8
Amager Market	5	8
Sutton Dwarf Gem	13	6
Paris Market	5	10

CAULIFLOWER—VARIETY TESTS

Project No. 54.—Two varieties were started in the hot-bed on April 19 and transplanted to the open on May 26 with the following results:—

Variety	Yield		
	Ready for use	Weight of 20 heads	Average weight
		lb. oz.	lb. oz.
Extra Select Dwarf Erfurt	July 23	48 12	2 7
Early Snowball	July 28	37 8	1 14

CABBAGE—VARIETY TEST

Project No. 55.—Twelve varieties of cabbage were started in the hot-bed on April 19 and transplanted to the open on May 26. The weights given in the following table are those taken when harvested on September 7:—

CABBAGE—TEST OF VARIETIES

Variety	Date ready for use	Total weight of 20 heads	Average weight
		lb. oz.	lb. oz.
Copenhagen Market	Aug. 15	150 0	7 8
Per. Drumhead Savoy	Oct. 1	92 0	4 10
Ex. Amager Danish Ballhead	Sept. 7	96 0	4 13
Flat Swedish	Sept. 1	126 0	6 5
Succession (Savoy)	Sept. 1	148 0	7 6
Enkhuizen Glory	Aug. 15	124 0	6 3
Marblehead Mammoth	Sept. 1	140 0	7 0
Kildonan	Aug. 22	136 0	6 13
Early Paris Market	July 23	108 0	5 6
North Favorite	Sept. 1	114 0	5 11
Early Jersey Wakefield	July 28	126 0	6 5
Brandon Market	Sept. 1	84 0	4 3

CARROTS—VARIETY TEST

Project No. 56.—Seven varieties of carrots were sown in rows 30 inches apart on May 18. The following table gives the dates they were ready for use and the yields when they were dug on September 28:

VARIETY TEST OF CARROTS

Variety	Date ready for use	Yield from 30-foot row
		lb.
Improved Danvers	July 20	90
Nantes Half Long Scarlet	" 20	62
Early Scarlet Horn	" 15	48
Hutchinson	Aug. 1	118
Selected Chantenay	" 1	108
Ox Heart	" 1	98
Garden Gem	" 1	106

CARROTS—THINNING EXPERIMENT

Project No. 56a.—An experiment in thinning carrots, using Half Long Chantenay, gave the following result:

Distances of thinning	Yield from 30-foot row
	lb. oz.
Thinned to 1 inch	55 0
" 2 inches	57 0
" 3 inches	50 0

VARIETY TEST WITH CELERY

Eight varieties were tested in 1921. The seed was sown on March 26 in the hotbed and the plants set out in the open on May 14. The rows were 4 feet apart.

Variety	Ready for use	Yield from 30-foot row
		lb. oz.
White Plume	Aug. 26	88 12
Golden Self Blanching		Badly diseased
French Success	Oct. 10	145 00
Sanfords Superb	" 20	105 00
Giant Pascal	" 20	107 00
Evans Triumph	" 20	140 00
Winter Queen	" 20	147 8
Golden Yellow	Sept. 8	86 00

CELERY—CULTURAL TEST

Project No. 57.—Experiments to date show that the best method of handling celery, in this district is to set the plants on the level and allow to grow without any hilling until near the middle of August. At that time the celery is banked with earth, care being taken not to allow any earth to fall into the heart of the plants.

CITRON—VARIETY TEST

Project No. 58.—Seed of four varieties of citron was sown in the open on May 28 and a fair yield was harvested on September 12.

Variety	Source	Total weight from 30-foot row	Weight of heaviest fruit
		lb. oz.	lb. oz.
Red Seeded, Preserving	Rennie	93 8	12 6
Citron	Ferry	91 3	7 8
Preserving (O-822)	Ottawa	84 0	9 12
Red Seeded (O-826)	Ottawa	91 12	6 9

GARDEN CORN—VARIETY TEST

Project No. 59.—Seventeen varieties of garden corn and one of pop corn were grown in 1921. The seed was sown on May 25. The varieties are listed in order of earliness.

GARDEN CORN—TEST OF VARIETIES

Variety	Season		Number of pickings	Number of days	Number of cobs from 30-ft. row
	From	To			
Pickaninny	July 28	Aug. 16	4	20	97
Sweet Squaw	Aug. 1	" 30	2	30	54
Sweet Kloochman	" 1	" 23	3	23	65
Wills Early June	" 16	Sept. 2	2	18	76
Assiniboine	" 16	Aug. 27	2	15	71
Early Malcolm	" 26	" 27	2	2	48
Imp. Early Dakota	" 27		1	1	58
Mietta Sweet	" 27		1	1	72
Malakoff	" 30		1	1	48
Early Mayflower	" 30		1	1	46
Sweet Otta	" 30		1	1	44
Extra Early Cory	Sept. 3	Sept. 7	2	5	48
Early Fordhook	" 3		1	1	56
Howling Mob	" 8		1	1	19
Pocohontas	" 8		1	1	44
Golden Bantam	" 14		1	1	30
Evergreen Bantam	" 15		1	1	3
Pop corn	" 17		1	1	58

CUCUMBERS—VARIETY TEST

Project No. 60.—Six varieties of cucumbers were sown in the open on May 28. The results listed are for 30 foot rows and are in order of yield.

Variety	First fruit ready for uae	Number of pickings	Number of days	Number of fruits
Early Russian	Aug. 12	11	32	242
Prolific	" 12	11	32	164
Giant Pera	" 12	11	32	145
Improved Long Green	" 13	8	21	44
Davis Perfect	" 13	8	21	24
West India Gherkin	" 30	2	14	2 lb. 10 oz.

KALE

Project No. 61.—The Dwarf Scotch variety was sown in the hot-bed on April 19 and transplanted to the open May 26. It made good growth but there is no market for it in this district.

KOHL RABI—VARIETY TEST

Project No. 62.—Three varieties were sown in the open on May 20 and harvested August 23 yielding as follows:—

Variety	Yield from 30-ft. row
	lbs.
Early Purple Vienna	90
Large Green Vienna	42
Early White	62

LETTUCE—VARIETY TEST

Project No. 63.—Eleven varieties were sown in the open on May 19. All made excellent growth and are listed below in the order in which they were ready for use:—

Variety	Ready for use
Grand Rapids	June 28
Suttons Early Paris Market	" 28
Earliest Wayahead	" 28
New York	July 7
Iceberg	" 7
Black Seeded Simpson	" 7
Improved Hanson	" 14
Salamander	" 14
Cos	" 14
Crisp-As-Ice	" 14
All Heart	" 14

MUSKMELONS

Project No. 64.—Extra Early Hackensack was started in the hot-bed on April 19 and in the open on May 28, but no fruit ripened on the vines in either instance.

ONIONS—VARIETY TEST

Project No. 65.—Twelve varieties of onions were sown in the open on May 18 and harvested October 1. Yields listed below are from 30-foot rows:—

ONIONS—TEST OF VARIETIES

	Good bulbs		Thick necks		Total	
	lb.	oz.	lb.	oz.	lb.	oz.
Ailsa Craig	21	5	7	1	28	6
Giant Prizetaker	24	5	3	1	27	6
Large Red Wethersfield	24	0	3	5	27	5
Southport Red Globe	24	0	2	4	26	4
Southport Yellow Globe	21	7	2	8	23	15
Extra Early Flat Red	19	7	2	1	21	8
Large Red Wethersfield	18	0	3	0	21	0
Yellow Globe Danvers (Graham)	19	6	1	1	20	7
Australian Brown	18	7	1	7	19	14
Yellow Globe Danvers (Ottawa)	18	5	1	1	19	6
Southport White Globe	16	7	2	1	18	8
White Bartletta	11	0	–	–	11	0

ONIONS—STARTED IN HOT-BED

Six varieties of onions were sown in the hot-bed on March 26, pricked out April 22, planted in the open June 1 and harvested October 1 with the following yields from 30-foot rows:—

Variety	Good bulbs		Thick necks		Totals	
	lb.	oz.	lb.	oz.	lb.	oz.
Giant Prizetaker	16	12	9	0	25	12
Southport White Globe	15	14	1	14	17	12
Southport Red Globe	15	9	1	12	17	5
Ailsa Craig	19	3	7	13	27	0
Red Wethersfield	14	6	3	4	17	10
Southport Yellow Globe	16	12	0	13	17	9

A comparison of the yields from these same varieties listed in the variety test shows that the yields are, in every case, greater from those sown in the open and there is little difference in the percentage of thick necks.

PARSLEY

Project No. 66.—Two varieties, Triple Curled and Champion Moss Curled, were sown on May 18, were ready for use on July 25 and made good growth throughout the season.

PARSNIPS

Project No. 67.—An experiment in thinning to different distances was conducted using the Hollow Crown variety. The seed was sown in the open on May 18 and the parsnips harvested on September 28. The four-inch thinning gave a lighter yield, with larger roots, than the two-and three-inch thinnings.

PARSNIPS—THINNING EXPERIMENT

Distance thinned to	Yield from 30-foot row
	lb.
2 inches apart	33
3 inches apart	34
4 inches apart	30

PEPPERS

Project No. 68.—Three varieties were sown in the hot-bed on April 9, pricked out April 29 and planted in the open on June 6. A few fruits ripened on the Harris Earliest plants before the snow of September 8 to 13 and the remaining green fruits, along with those from Red Chili and Long Red Cayenne, ripened indoors.

GARDEN PEAS—CULTURAL TEST

Project No. 69.—To learn whether the season for green peas could be more easily extended by the use of varieties of different seasons or by a succession of sowings of one variety, four different varieties were sown on May 18 and four successive sowings of Thos. Laxton were made at intervals of one week between sowings.

GARDEN PEAS—CULTURAL TEST

	Date ready for use	Total number pickings	Number of good pickings	Total legnth of season in days	Season of good pickings in days	Yield from 30-foot row
						lb. oz.
Thos. Laxton	July 16	5	2	47	5	15 15
McLean Advancer	" 19	4	3	25	14	19 5
Gradus	" 19	4	2	25	10	13 15
Stratagem	Aug. 5	2	2	8	8	8 6
Date sown—						
May 18	July 16	5	2	47	5	15 15
May 25	" 19	3	1	12	1	15 15
June 1	" 19	3	2	25	6	11 2
June 8	" 28	3	3	35	32	14 11

Results, as listed above, show very little variation in the dates on which the peas, of a given variety, were ready for use.

POTATOES—VARIETY TEST

Project No. 45.—The potato varieties were planted May 21. They were slightly checked in growth by dry weather in late June, but the later rains revived them, resulting in a good yield. All varieties were harvested on October 1. The yield was calculated from production of six rows, 68 feet long and 33 inches apart.

VARIETY TEST WITH POTATOES

Variety	Condition when dug	Yield per acre
		bush.
Early Ohio	Ripe	260
Gold Nugget	"	182
Bovee	"	192
Irish Cobbler	"	214
Vick Extra Early	"	220
Reeves Rose	"	190
Everitt	"	223
Dreer Standard	Not mature	252
Carman No. 1	Ripe	279
Empire State	Not mature	292
Wee MacGregor	"	284
Late Puritan	"	312
Rochester Rose	Ripe	239
Rawlings Kidney	Not mature	290
Moneymaker	"	305
Morgan Seedling	"	282
Dalmeny Beauty	"	300

PUMPKINS—VARIETY TEST

Project No. 70.—The following crop was harvested on September 12 from a 30-foot row of three varieties of pumpkins which were sown in the open on May 19:—

Variety	Yield	
	lb.	oz.
King of the Mammoths	68	6
Small Sugar	72	0
Connecticut Field	60	7

RADISH

Project No. 71.—Scarlet Turnip White Tip and Icicle were the varieties of summer radish grown in 1921. The winter variety used was Long Black Spanish.

SALSIFY

Project No. 72.—Long White variety was sown in the open on May 19. A 30-foot row yielded 44 pounds.

SPINACH

Project No. 73.—The five varieties of spinach tested made good growth.

SQUASH—VARIETY TEST

Project No. 74.—Of the five varieties of squash grown only two matured any fruit.

Variety	Dates harvested	Yield from 30-ft row
		lb. oz.
Golden Hubbard	Sept. 12 to 17	44 3
English Vegetable Marrow	Aug. 10 to Sept. 27	191 11
Delicious	Did not mature	
Hubbard	" "	
Long White Bush Marrow	" "	

TOMATOES

Project No. 75.—The variety test in tomatoes was carried on as usual, and, in addition, considerable cultural work was done in 1921. All seed was sown on April 9 and plants transplanted to flats on April 28. The second transplanting of the plants in the transplanting experiment was done on May 5. Plants were put four feet apart in the rows and the rows four feet apart. Records were taken on thirteen plants. What fruit still remained on the vines on September 10 was harvested to avoid frost.

Variety	First ripe fruit	Fruit ripe on 13 Plants				Yield from 13 Plants					
		Up to Aug. 15		Aug. 15 to 23		Aug. 23 Sept. 10		Ripe		Green		Total	
		lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.	lb.	oz.
John Baer.....(Carter)	Aug. 12	0	12	2	15	42	4	45	15	22	0	67	15
Alacrity X Hipper	" 6	3	11	9	5	65	9	78	9	37	0	115	9
Crimson Canner	" 6	2	14	5	15	40	15	49	12	65	8	115	4
Danish Export	" 6	6	5	4	10	38	7	49	6	50	0	99	6
Alacrity X Earlibell	" 6	1	15	4	2	46	11	52	12	49	0	101	12
Alacrity	July 31	5	5	6	10	57	15	69	14	37	8	107	6
John Baer (Ottawa)	Aug. 8	2	2	4	4	38	11	45	1	41	4	86	5
Earlibell	" 15	1	8	5	7	38	12	45	11	56	8	102	3
Bonny Best	" 10	1	8	3	2	40	12	45	6	56	0	101	6
Chalk Jewel	" 8	4	5	5	2	42	6	51	13	62	8	114	5
Chalk Early Jewel	" 8	3	5	5	8	33	12	42	9	64	0	106	9
Red Head	" 8	5	14	7	7	28	12	42	1	66	0	108	1
Danish Export (Wiboltt)	" 12	1	11	4	11	35	7	41	13	44	8	86	5
First of All	" 8	2	3	5	2	52	13	60	2	42	8	102	10
Burbank Early	" 8	6	12	5	10	44	10	57	0	42	0	99	0
Stirling Castle	" 12	0	14	5	8	34	1	38	7	56	8	94	15
Sunshine	" 10	1	14	3	7	34	12	40	1	61	4	101	5
Danish Export (Rosthern No. 1625)	" 8	2	8	4	12	41	0	48	4	79	0	127	4
Danish Export (Rosthern No. 1632)	" 6	2	13	4	10	28	8	35	15	36	0	71	15
Bonny Best	" 12	1	5	2	6	32	13	36	8	96	0	132	8

TOMATOES—CULTURAL TEST

Project No. 75a.—A comparison was made of yields from plants which were transplanted twice with those which were transplanted only once.

In two varieties the total yield was higher and in all the varieties the amount of ripe fruit was greater where two transplantings were made. The fruit also ripened earlier than with one transplanting.

TOMATOES PRUNED TO TWO STEMS VS. ONE STEM AND PRUNED TO ONE STEM OF THREE BUNCHES VS. ONE STEM AND ALL BUNCHES

Project No. 75b.—In this experiment one lot of plants of three varieties was trimmed to one stem and another to two stems. Of those trimmed to one stem, part were kept trimmed to three bunches of fruit and part were allowed to develop bunches without restriction.

In two varieties the total yield was greatest where trimmed to two stems and was less on one variety, but the amount of ripe fruit was considerably greater where the plants were trimmed to one stem.

Trimming to one stem and allowing all the bunches to develop showed a decided advantage over limiting the fruit to three bunches. Both the total yield and the amount of ripe fruit were greater, and there was little difference in the time of ripening.

SUMMER TURNIPS

Project No. 76.—Summer turnips grown in this district are very bitter and, therefore, of little value for table use. The following four varieties were grown:—

SUMMER TURNIPS—VARIETY TEST

Variety	Date ready for use
Red Top Strap Leaf	June 25
Golden Ball	July 1
Early Snowball	July 1
Extra Early Purple Milan	June 25

WATERMELONS

Project No. 77.—Coles Early was grown this year but no fruit matured.

FRUITS

SMALL FRUITS

Strawberries, black currants, red currants, raspberries and gooseberries are found wild througnout northern Saskatchewan and wherever a fruit is found flourishing under natural conditions it is likely to thrive well under cultivation.

The first requisite in a fruit plantation, however, is an adequate windbreak. This can be most easily supplied by planting caragana seed or Russian poplar cuttings or young trees of either. Sunflowers afford an excellent temporary windbreak.

CURRANTS

Project 36.—The old plantation set out in 1912 is becoming difficult to handle because it requires such vigorous pruning. A new plantation has been set out.

GOOSEBERRIES

Project 35.—Gooseberries have never proved satisfactory here. The fault may be due to the varieties so far tested, and others are now being tried.

RASPBERRIES

Project 37.—Herbert continues to be the most satisfactory variety tried at this Station, both in point of yield and quality.

BLACK CURRANTS—VARIETY TEST

Project No. 36a.—The currants are planted in rows six feet apart and the plants five feet apart in the rows. Yields of all fruits are given as "standard berry boxes" which contain four-fifths of a quart.

VARIETY TEST WITH BLACK CURRANTS

Variety	Season when ripe	Size of fruit	Yield from six plants S.B.B.	Average yield per plant S.B.B.
Clipper	July 25-Aug. 5	M	5·0	0·8
Collins Prolific	" 22- " 5	M	8·7	1·5
Victoria	" 27	M	3·7	0·6
Buddenborg	" 22-July 27	L	5·0	0·8
Success	" 18-Aug. 5	M	9·5	1·6
Eagle	" 22- " 5	M	23·7	4·0
Topsy	" 21- " 5	M	13·7	2·3
Boskoop Giant	" 21-July 27	M	6·2	1·0
Lee's Prolific	" 21-Aug. 5	M	17·5	2·9
Eclipse	" 21	M	3·0	0·5
Magnus	" 22	M	4·7	0·8
Climax	" 23	M	3·0	0·5

NOTE.—S.B.B. means "Standard berry boxes"; M means "medium"; L means "large".

STRAWBERRIES—VARIETY TEST

Project No. 38.—Strawberries planted in rows three feet apart with twelve inches between the plants will bear well the two following years but not longer. The following is the yield in 1921 from the most promising varieties planted in the spring of 1920:—

Variety	Yield in standard berry boxes	
	From 50-foot row	per acre
Dakota	52	15,197
Senator Dunlap	27	7,819
	15	4,423

Project No. 36b RED CURRANTS—VARIETY TEST

Variety	Season when ripe	Size of fruit	Yield in standard berry boxes	
			From 6 bushes	Average per bush
Red Grape	July 22–27	M	30·5	5·1
Victoria Red	" 22	L	20·2	3·4
Greenfield Red	" 25	L	15·5	2·6
Cumberland Red	" 20	L	18·7	3·1
Rankin's Red	" 26	L	42·0	7·0
Pomona	" 18	L	17·0	2·8
Wilder	" 20	L	7·5	1·3
Franco-German	Aug. 3	M	10·0	1·7
Red Dutch	July 20–Aug. 3	M	30·7	5·1
Raby Castle	" 20	M	17·5	2·9
Stewart	" 22–Aug. 3	M	10·0	1·7
North Star	" 22–Aug. 3	M	23·5	3·9
Long Bunch Holland	" 28–Aug. 3	M	24·2	4·0

Note: M means medium; L means large.

Project No. 36c WHITE CURRANTS—VARIETY TEST

Variety	Season when ripe	Size of fruit	Yield in standard berry boxes	
			From 6 bushes	Aver. per bush.
White Grape	July 19	M	23·0	3·8
Large White	" 22	M	9·5	1·6
White Cherry	" 21-26	M	15·2	2·5

NOTE.—M means Medium.

TREE FRUITS

Project 39.—The native wild plum of Manitoba, *Prunus nigra,* was introduced into northern Saskatchewan by the settlers in the early nineties, and is thriving in many gardens. It is a small yellow or red plum, somewhat tart, and makes excellent preserves. A thousand of these trees were planted at the Experimental Station in 1915 and came into bearing in 1919 and 1920. An effort is being made to develop from them a plum of larger size and milder flavour.

The best apples so far grown at the Station are crabs of rather small size. There has not been anything accomplished so far in growing apples at Rosthern to warrant a private individual making an investment in nursery stock.

ORNAMENTAL GARDENING

FLOWERS

The flower border showed a continuous bloom from the time the tulips, narcissi and hyacinths started late in May till the frost caught the asters, dahlias, sweet peas, stocks, phlox, nasturtiums and larkspur in September. The frequent rains throughout the summer, together with absence of frost, gave ideal conditions for the development of the flower border.

ORNAMENTAL SHRUBS

Project 79.—There are now under test twenty-nine hedges, of which the eight best in order of merit, considering foliage, hardiness and appearance are native white

spruce, caragana arborescens, laurel leaved willow, tartarian honeysuckle, common lilac, Manitoba plum, Manitoba maple and native tamarac.

The native snowberry and prairie wild rose make splendid low hedges.

Hedges at the Experimental Station, Rosthern, 1921.

CEREALS

Though the season opened late, 1921 proved a very favourable year for cereals. Good growing weather predominated from the time of seeding until harvest, with a plentiful supply of moisture except for a short time during late June and early July. A good stand of straw with well-filled heads was the result. An outbreak of grasshoppers in the latter part of June created some alarm in the district, but very little damage occurred to field grain. Some of the small trial plots suffered to a slight extent. Rust also caused considerable damage to late wheat and oats. Early wheat, such as Ruby, was particularly free from this fungus. Rain after harvest, from September 9 to 13, damaged grain in stook. Due to warm weather after the rain, sprouting commenced and wheat threshed at this time stood at least one grade lower than that threshed earlier. This will also considerably affect the germinability of such grain for seed.

For the stinking smut of wheat, the loose smut and covered smut of oats and the covered smut of barley, the following treatment is advised by the Dominion Cerealist, for small quantities of grain:—

> "Mix half an ounce of ordinary formaldehyde with five quarts (200 ounces) of water. (An ordinary tablespoon holds about half an ounce). Immerse the grain for five minutes and then spread it out in a thin layer to dry. This treatment should not be given until a day or two before the seed is to be sown.
>
> "Hulless oats and hulless barley, being particularly sensitive to the action of the chemicals, should first of all be soaked for three hours in water and should then be allowed to drain for one hour before being immersed in the formaldehyde solution.
>
> "Unless the solutions are accurately prepared and the directions carefully followed the vitality of the seed may be destroyed."

Variety—$\frac{1}{40}$—acre plots	Date of sowing	Date of ripening	Number of days maturing	Average length of straw including head	Strength of straw on a scale of 10 points	Average length of head	Actual yield of grain per acre	Per cent stand	Weight per measured bushel after cleaning	Remarks
				inches		inches	lb.		lb.	
Red Fife	May 3	Aug. 18	107	36	8½	3½	1,940	99	61·0	
Marquis	" 3	" 15	104	35	8½	3	1,940	95	62·5	
Kitchener	" 4	" 18	107	36	8½	3¼	1,840	100	60·0	
Red Bobs Supreme	" 4	" 12	100	35	8½	3¼	1,800	98	62·0	
Preston	" 4	" 13	101	36	8½	3¼	1,800	98	62	
Pioneer	" 4	" 11	99	34	9	3	1,500	100	62	
White Bobs	" 4	" 11	99	32	9½	4	1,480	98	63	
Kubanka	" 3	" 19	108	40	7	2¾	1,360	70	63	Loss in stand due to thin sowing and wire worms.
Ruby	" 4	" 6	94	34	8	2¾	1,340	100	62	
Red Bobs Early Triumph	" 4	" 11	99	35	9	3¼	1,320	99	59	
Prelude	" 4	" 3	91	28	10	2½	1,120	100	63	
¼ acre plots on fall ploughed stubble land—										
Marquis	" 17	" 18	93	36	8	3	1,480	100	.....	
Ruby	" 18	" 11	85	36	8½	2½	1,448	100	.....	
Red Fife	" 18	" 22	96	36	10	3	1,392	100	.....	Loss from shelling due to heavy wind when ripe.
Preston	" 18	" 23	97	37	9½	3¼	1,260	100	.....	
Red Bobs 43	" 17	" 15	90	33	10	3	1,112	100	.....	

Ruby in each case was earlier than any other variety and entirely free from rust. With these qualities it promises to be of great value in the northern part of the province. Marquis and Red Fife still hold their old positions as high yielders, especially on summerfallow, when the season is long enough for them to ripen. Red Bobs was tried for the first time this year but rusted very badly.

OATS—VARIETY TEST

Project No. 79.—Eleven varieties of oats were tested on one-fortieth-acre plots on fallow and eight varieties on one-eighth-acre plots on stubble. The following are the results:—

Victory and Banner still hold the lead among oats, and according to tests on the Station a farmer cannot do better than use either one of them. Liberty, a hulless variety, did well this year. Apart from being difficult to treat for smut, it is very satisfactory.

OATS—VARIETY TEST

Variety—$\frac{1}{40}$-acre plots	Date of sowing	Date of ripening	Number of days maturing	Average length of straw, including head	Strength of straw on a scale of 10 points	Average length of head	Actual yield of grain per acre	Per cent stand	Weight per measured bushel after cleaning	Remarks
				inches		inches	lb.		lb.	
Victory	May 5	Aug. 8	95	38	$7\frac{1}{2}$	8	2,880	100	38	
Banner	" 5	" 8	95	37	$8\frac{1}{2}$	$7\frac{1}{2}$	2,840	100	36	
Ligowo	" 5	" 8	95	38	$7\frac{1}{2}$	8	2,720	100	38	
Leader	" 5	" 8	95	36	$8\frac{1}{2}$	7	2,400	100	35	
20th Century	" 5	" 8	95	38	8	$7\frac{1}{2}$	2,360	100	33	
O.A.C. 72	" 5	" 8	95	40	$7\frac{1}{2}$	8	2,400	100	$37\frac{1}{2}$	
Gold Rain	" 5	" 8	95	38	8	$7\frac{1}{2}$	2,000	99	39	
80-Day	" 5	" 1	88	33	10	$7\frac{1}{4}$	1,720	98	32	
Daubeney	" 5	" 1	88	34	$9\frac{1}{2}$	7	1,700	99	36	
Liberty	" 5	" 8	95	37	8	8	1,680	85	48	Loss in stand due to poor germination and wire worms.
Alaska	" 5	July 30	87	33	8	7	1,420	99	38	
$\frac{1}{4}$-acre plots on fall ploughed stubble land—										
Banner	" 24	Aug. 16	84	36	10	$6\frac{3}{4}$	2,888	100		
Gold Rain	" 24	" 15	83	37	10	$7\frac{1}{2}$	2,568	100		
Victory	" 27	" 18	83	36	10	7	2,272	100		
Leader	" 24	" 18	86	36	10	$8\frac{1}{2}$	2,216	100		
Ligowo	" 24	" 15	83	38	9	$6\frac{1}{2}$	1,928	100		
20th Century	" 24	" 16	84	36	10	$7\frac{1}{2}$	1,920	100		
O.A.C. 72	" 24	" 17	85	36	10	$7\frac{1}{2}$	1,904	100		
Liberty	" 24	" 11	79	36	10	7	1,496	100		

BARLEY—VARIETY TEST

Project No. 80.—Twenty-one varieties of barley were tried out on one-fortieth-acre plots on fallow and nine varieties on one-tenth-acre plots on fall-ploughed stubble.

Three varieties of barley, Hannchen, Barks and Trebi, were tried for the first time at this Station and gave higher yields than any of the old, standard varieties. Barks is the most promising, having a very stiff straw with an upright, six-rowed head. The following is a statement of yields:—

VARIETY TEST WITH BARLEY

Variety	Date of sowing	Date of ripening	Number of days maturing	Average length of straw, including head	Strength of straw on a scale of 10 points	Actual yield of grain per acre	Per cent stand
				inches		lb.	
Hannchen	May 6	Aug. 11	97	31	7½	3,140	100
Barks	" 6	" 15	101	32	10	3,100	100
Tribi	" 6	" 1	87	28	8	2,580	100
Swedish Chevalier	" 6	" 13	99	33	6	2,320	100
Gold	" 6	" 8	94	28	8	2,240	100
Chinese	" 6	" 2	88	37	8½	2,220	100
Swan's Neck	" 6	" 8	94	29	8	2,080	100
Stella	" 6	" 6	92	37	7½	2,080	100
Himalayan	" 6	July 27	82	27	8½	1,940	100
Early Chevalier	" 6	" 28	83	35	7	1,920	100
Odessa	" 6	Aug. 2	88	36	8	1,820	100
Taganrog	" 6	" 1	87	33	8½	1,800	100
O.A.C. No. 21	" 6	" 2	88	36	7½	1,780	95
Duckbill	" 6	" 11	97	34	9	1,700	100
Albert	" 6	July 27	82	30	9	1,340	100
Success	" 6	" 27	82	50	8½	1,320	100
One-tenth-acre plots on fall ploughed stubble land—							
Swedish Chevalier	" 30	Aug. 24	86	30	6	2,570	100
Gold	" 30	" 18	80	28	10	2,200	100
Early Chevalier	" 30	" 11	73	33	6	2,030	100
Stella	" 30	" 13	75	32	8	1,980	100
O.A.C. No. 21	" 30	" 13	75	32	6½	1,870	100
Taganrog	" 30	" 13	75	30	6½	1,810	100
Swan's Neck	" 30	" 18	80	30	10	1,700	100
Success	" 30	" 6	68	30	8	1,640	100
Duckbill	" 30	" 24	86	31	10	1,320	100

FIELD PEAS—VARIETY TEST

Project No. 81.—Four varieties of peas were tried on one-tenth-acre plots on fallow. They made excellent growth, but would have stood up much better if they had been sown more thickly. Considerable difficulty was experienced in threshing peas this year. The ordinary thresher is speeded so high that it breaks the peas even when the concaves are wide open. By having a man at the engine to throttle it down a fair sample was obtained.

The yields were as follows:—

VARIETY TEST WITH FIELD PEAS

Variety	Yield	Days maturing
	bush. lb.	
Champlain Ottawa 32	36 00	110
Arthur Ottawa 18	35 20	110
Early Feed, Ottawa 30	30 00	110
Chancellor, Ottawa 26	26 40	110

FLAX—VARIETY TEST

Project No. 82.—Three varieties of flax were tried out this year with very good results. Though sown rather late and on stubble land, the growth was rapid and all ripened before fall frosts.

Variety	Yield, 1921		Days maturing
	bush.	lb.	
Premost	12	0	102
Novelty	12	0	102
Long Stem	12	0	102

FORAGE CROPS

As there has been no catch of grass on the Station for two years, there was no hay on the rotations in 1921. All plots to be sown in 1921 were sown as usual with a nurse crop and those which did not catch in 1920 were sown again in 1921. Those sown in 1921 promise well for a good catch in all rotations, due to a favourable season.

A contrast in the types of sunflowers.

LEGUMINOUS PLANTS AND GRASSES

An experiment with brome, western rye, alfalfa and sweet clover, under the same conditions, was started this year, twenty plots one-tenth-acre in size being used for each sort. In ten plots in each case a nurse crop is used, and in the other ten the seed is sown without a nurse crop.

Plot 1.—Sown broadcast.
" 2.— 6-inch drills.
" 3.—24-inch "
" 4.—30-inch " for seed.
" 5.—36-inch "
" 6.—Sown broadcast.
" 7.— 6-inch drills.
" 8.—24-inch "
" 9.—30-inch " for hay.
" 10.—36-inch "

Though sown a little late, a good catch was made and all promise well for 1922, excepting some of the grass plots, which were damaged by grasshoppers.

FIELD ROOTS

All varieties of turnips germinated well, but owing to wire worms were thinned out to some extent. After hoeing, the activities of the wire worms were hardly noticeable.

The greatest distance between plants gave the best results, but the experiment must be tried several seasons before authentic results can be obtained. The larger roots produced by the larger spacing are certainly easier to harvest.

The fall turnips were sown at the same time as the swedes, and owing to their early maturity had to be harvested in August. To get the best results from this variety of turnip it appears that they should be sown in June or July, so that they would still be firm and in good condition for keeping late in the fall. They can be used to advantage when sown in the spring if late summer feed of a succulent nature is required for dairy cattle or other stock. This year, those grown were fed to sheep on pasture.

The carrots had many setbacks, due largely to heavy winds in the spring and summer which cut them off with sand blown from adjoining summer-fallow. One variety, Long Red Surrey, was practically destroyed and no results were obtained.

Project No. 32 FIELD TURNIPS—VARIETY TEST

Variety	Source	Date sown	Date pulled	Yield per acre
				tons lb.
Hall's Westbury	McKenzie	May 14	Oct. 12	20 576
Monarch	"	" 14	" 12	19 16
Bangholm	"	" 14	" 12	17 432
Ditmar's Swede	C.E.F.	" 14	" 12	19 400
Yellow Aberdeen Green Top	"	" 14	" 12	12 512
Ditmar's Swede	Kentville	" 14	" 12	19 272
Canadian Gem	"	" 14	" 12	15 1904
Green Top	"	" 14	" 12	13 240
Champion	Charlottetown	" 14	" 12	18 608
Champion	Sutton's	" 14	" 12	17 304
Monarch	Nappan	" 14	" 12	15 848

Project No. 32a. FIELD TURNIPS—THINNING EXPERIMENT

Variety	Distance between rows	Distance between plants	Date sown	Date pulled	Yield per acre
	inches	inches			tons lb.
Hall's Westbury	30	6	May 16	Oct. 12	18 352
" "	30	12	" 16	" 12	20 576
" "	30	18	" 16	" 12	20 1728

Project No. 32b FALL TURNIPS—VARIETY TEST

Variety	Source	Date sown	Date pulled	Yield per acre
				tons lb.
Stubb	Ottawa	May 16	Aug. 16	14 800
Ostersundom	"	" 16	" 16	11 592
Bortfelder	"	" 16	" 16	9 1680
Greystone	"	" 16	" 16	7 368

Project No. 30 CARROTS—VARIETY TEST

Variety	Source	Date sown	Date pulled	Yield per acre
				tons lb.
Danish Champion	Ottawa	May 16	Oct. 14	4 1212
White Intermediate	Summerland	" 16	" 14	4 192
Improved Half Long White	McKenzie	" 16	" 14	3 1680
Long White Belgian	McFayden	" 16	" 14	2 608

SUNFLOWERS VARIETY TEST

Project No. 83.—Eight varieties of sunflowers were planted on the same date. Three samples of local sunflower seed were obtained from farmers in the district. To distinguish them, two were given the names of the growers and the third was called Rosthern No. 1. Three samples of seed were sent from Ottawa, one from Alberta by Mr. G. H. Hutton, and the Russian Giant was commercial seed obtained from a seed house.

Russian Giant gave the most tonnage. The seed sent from Ottawa also produced a large, coarse plant and was slightly later than Russian Giant. The Alberta sunflower was earlier, with a coarse stalk and a very heavy head, while Ottawa 76 and Dr. Saunders' Early were of a finer type moderately early and with a medium-sized head.

While no definite data have yet been gathered at this Station as to the feeding qualities of the several varieties grown, it would appear that the finer type is preferable.

All varieties were cut, as nearly as possible, at the same stage of maturity, the stage being when flowering had reached half way to the centre of head on over fifty per cent of the plants.

Six heads each of Early Ottawa, Dr. Saunders' Early and Macoun's were covered with cheesecloth to insure self-fertilization so as to obtain pure strains for further work.

VARIETY TEST WITH SUNFLOWERS FOR ENSILAGE

Variety	Average height in inches	Date cut	Yield
	in		Tons lb.
Russian Giant	100	Sept. 15	16 0
From Mr. Macoun, Ottawa	96	" 15	15 1375
Early Ottawa 76	86	Aug. 11	11 1200
Alberta	72	" 11	11 950
Brown	70	" 11	10 300
Dr. Saunders' Early	86	Sept. 5	7 1750
R. No. 1 from 1914 seed	56	Aug. 5	3 1650
Friesen	60	July 30	3 1050

INDIAN CORN FOR ENSILAGE

Project No. 28.—The corn varieties were sown this year earlier than is customary, only about two weeks after the first cereals. Due to the warm spring and freedom from late frosts, however, it proved an advantage and made it possible to ripen three varieties.

All varieties suffered from a severe wind on June 11, but Quebec 28, being the outside plot, was damaged more than the others. North Western Dent, the other outside plot, also suffered from an east wind. On September 1 the three varieties which were near maturity were attacked by crows, and, before cutting, were practically stripped of ears. The corn suffered no damage from frost at any time, and, aside from wind, the season proved very favourable to its growth. Seed was saved from Twitchell's Pride and Canadian Yellow, but as they were all close together it was, no doubt, cross-fertilized.

The years 1920 and 1921 were both very favourable for corn, but when we consider that from 1915 to 1919, inclusive, no crop was harvested it may be inferred that it is a very uncertain crop in this district.

INDIAN CORN FOR ENSILAGE—TEST OF VARIETIES

Variety	Average height	Condition when cut	Yield per acre
	inches		Tons lb.
Compton's Early	96	Kernels in early milk	19 720
Longfellow	96	Ears forming	17 1200
North Western Dent	94	Ears well formed	16 1760
Twitchell's Pride	72	Some ears ripe	15 720
Canadian Yellow	72	"	11 176
Quebec 28	66	"	10 480

POULTRY

A good foundation has been laid for work with poultry at the Station. There are one hundred and fifty Barred Plymouth Rock hens, besides small flocks of Pekin ducks and Bronze turkeys as foundation stock. The buildings consist of two 100-hen houses and six colony houses.

EXTENSION AND PUBLICITY

An exhibit representing some of the work carried on at the Experimental Station was prepared and shown at Prince Albert and Rosthern Exhibitions.

The superintendent attended and addressed fifteen farmers' meetings and conventions during the year, and acted in the capacity of judge at six fairs. He also conducted a series of classes in stock and seed judging at the public school at Birch Hills during the late winter of 1921.

There were three farmers' picnics held at the Station during the summer.

NEW BUILDINGS

A dairy cattle barn has been built with a capacity for eighteen cows besides what young stock may be accommodated in three box-stalls.