DOMINION OF CANADA
DEPARTMENT OF AGRICULTURE
DOMINION EXPERIMENTAL FARMS

EXPERIMENTAL SUB-STATIONS

FORT VERMILION, ALTA.
SALMON ARM, B.C.
BETSIAMITES, QUE.
SWEDE CREEK, YUKON
FORT SMITH, N.W.T.
FORT RESOLUTION, N.W.T.
FORT PROVIDENCE, N.W.T.

REPORT OF THE EXPERIMENTALISTS IN CHARGE

For the Year 1923

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OTTAWA
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PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
1925

FORT VERMILION, ALBERTA

REPORT OF THE SUPERINTENDENT, ROBERT JONES

THE SEASON

The winter of 1922, and 1923 was a very severe one, with a much steadier below-zero temperature during the five principal winter months, viz. November, December, January, February and March, and with more frequent high winds than usual during this whole period. This with the snow of early October, which did not fully disappear until the end of April, made the winter very long.

A considerable number of severe frosts were experienced during the month of October, and ploughing was not possible after October 20. With the unfavourable weather of October, 1922, threshing was extended well into November, and much of the grain was in a moist condition when it was finally threshed.

November opened quite cold, and blustery, the temperature being well below zero on twelve different occasions during the month (-34.2 being the lowest recorded). This occurred on the night of November 18, and towards the end of the month the maximum temperature reached the zero mark. When this happens it is extremely cold. When the day temperature is well below zero, it is a good thing for all stock to be under some shelter or other, even if it is only a straw shed, which would protect them from the bitter, biting winds. I have noticed throughout this district that a goodly percentage of loss in stock during the past two winters was caused by stock not being housed. This was mostly done by newcomers, who think it possible to winter stock in this Northland without shelter.

The weather of December was quite cold, with high winds on fourteen days. Snow fell on seven different occasions, and many cloudy, and overcast days were experienced during the month. There being sufficient snow on the ground at the beginning of the month to make good sleighing, the hauling of hay and wood was able to proceed in good order, a large amount of both being used in this Northland. There is a plentiful supply of both wild hay, and dry fuel within a reasonable distance of the settlement. This good sleighing also enabled the farmers of the district to haul their different farm products to the market.

The month of January was extremely cold, the minimum temperature ranging from -4.6 below zero (the highest) to -53.0 below zero, the lowest throughout the whole of the month. The maximum temperature was also well below zero on twenty days during the same period. This low temperature, with the very high winds from the northwest, which blew almost continuously throughout the month, made it extremely difficult to keep the roads passable. Snow fell on six different occasions. All stock was kept under cover during the extreme cold period.

February was also a very cold and stormy month, and at times the roads were almost impassable for any kind of hauling. The lowest temperature of the winter was recorded during this month, as on the night of the 13th, the mercury dropped to -56.2 below zero, and the following night to -52.5, and only on seven mornings during the month was it slightly above zero. Snow fell on four

different occasions during the month, three inches being the largest amount at any one time, four and a quarter inches being the total amount of precipitation for the month, the total depth of snow on the ground at the end of the month was 28½ inches. February had a fair amount of sunshine with only four days overcast.

March was on the whole a comparatively cold, and blustery month. Snow fell on seven different days. The wind blew almost continually throughout the month, principally from the west, and the minimum temperature ranged from -1.0 to -43.0 below zero. A fair average amount of sunshine was experienced during this month, which made up somewhat for its unpleasantness in other particulars.

The weather during the month of April was considerably milder than the preceding month, although the minimum temperature remained well below zero until the 11th, when it turned slightly warmer; but no real thaw took place till well towards the end of the month. From the 20th, to the 26th the snow disappeared quite rapidly, leaving a large amount of water on the fields, which was slow in penetrating into the soil, and in consequence no work on the land was possible during April. Seeding, and other spring work was much later than usual in getting started.

May opened bright, with the temperature above normal, and with a slightly above normal precipitation. The first work on the land, such as discing, and surface cultivation was done from the 3rd, to the 6th, and was only possible on the higher portions of the farm. The first wheat was sown on the 7th, and from this date seeding and other farm operations were rushed along as rapidly as we were able, on account of the lateness of the season, and taking full advantage of a fine dry spell which extended from the 4th to the 21st. From the 22nd to the end of the month frequent heavy showers of rain were experienced, and on the 28th, a very heavy downpour took place, measuring 1.36 inches, this being sufficiently heavy to interrupt seeding operations and any other work on the land, for a number of days, as the soil was still very moist, and in the low spots quite wet, from the melted snow of April. The seeding of the different grains, and some of the annual fodders, was extended into June on account of this wet spell. A small percentage of transplanting had been done just previous to these rains, and the plants moved got the full benefit of this moisture which also hastened germination of the cereals. Oats were first sown on the 8th, and the first barley on the 12th, some plots of potatoes were planted as early as the 8th, these being for early use, other plots were not planted until the 24th, at this date the soil had warmed up considerably, and with the abundance of moisture in the ground germination was rapid, and the after-growth very good.

The bees were not taken out of their winter quarters until the 4th, and there was still some snow in the shrubbery on the 11th. The last spring frost occurred on the night of the 19th, when 27.0 was recorded, making 5 degrees of frost, no damage being done.

It was found on examining the plots of winter wheat, and rye, that they showed effects of the winter. A much greater percentage of winter-killing showed on the wheat, than ryes. These plots made very fine growth later on, and produced a fair crop when harvested. Considerable wind was experienced during the first part of the month, but not sufficiently strong to cause any soil drifting.

June was bright, and comparatively dry, with less than a normal precipitation, but while the precipitation was light no crops were checked, as there was still sufficient moisture in the soil for rapid germination, and good growth. No

frost whatever was recorded during June. The transplanting of the vegetables, and the flowers was proceeded with, but was not finished until the 20th, the celery being the last to be set out, as other work in the field was pressing. The sunflowers, and other annual fodder plants made fair growth during the later part of the month, but many blank spots were noticed in the plots of corn, this being caused by the ravages of the wire-worms. Many of the hardy annual flowers were in bloom, and the early-sown vegetables became fit for use. The few light showers of rain which fell during the middle of the month were very beneficial to the grasses and clover plots which were then giving promise of a good yield. All berries, and bush fruits were in bloom in the early part of the month, and with the absence of any late spring frosts the fruit set well, and all varieties produced a fair crop later. Many of the late varieties of garden vegetables were fit for use by end of the month. Wheat headed out by the 26th, this being just 50 days from date of seeding, oats on the 28th, and barley on the 27th.

July was an ideal growing month, bright, and clear, with hours of sunshine slightly above the normal, and sufficient precipitation to carry all crops along in fine condition. All garden vegetables were in use by the middle of the month, and of a fair size. Potatoes were fit for use by the 14th, of a medium size, and very plentiful in the hills, giving indications of a bumper crop later on. The harvesting of the different varieties of grasses, alfalfa, and clovers, was commenced on the 10th, and completed on the 20th. The weather conditions during this spell were fine, free from rain and other adverse conditions. The hay crop was slightly above the average and was saved in excellent shape.

By the 21st many of the earlier varieties of oats, and barley were changing colour, and on this date we experienced a heavy downpour of rain, amounting to 1.36 inches. This rain was accompanied by a high southwest wind, which caused the greater majority of the grains to lodge badly. They were kept beaten down by the frequent heavy showers during the balance of the month. These showers came in the form of thunderstorms, and were of short duration. The rains not only caused the grain to lodge, but also caused a second growth to spring up, which greatly prolonged the ripening period, and in many cases made it impossible to use the reaper when cutting finally started, as the plots were so badly tangled up.

The weather conditions throughout the whole of the month of August were very unfavourable for good, or rapid, harvest operations, as rain fell on fifteen different days during the month, causing much delay, further flattening down the grain plots, and increasing the second growth considerably in all the plots. The first grain to reach maturity was the Albert barley which was cut on the 1st. The first wheat, Prelude, was cut on the 11th, and the first oats on 18th. Cutting on the Experimental area was not completed until the extreme end of the month, and no threshing was possible till well into September. With all the moisture, and other unfavourable conditions much of the oats, and barley were off colour. A small percentage of the roots were harvested during the close of the month, these being principally fall turnips, used as feed to supplement the failing pastures. All other varieties of field roots, along with the potatoes, were not harvested until well into September. From August 29, to September 1, the corn, and sunflowers were harvested, the cutting being done in the morning, and the afternoon employed in hauling from the field to the silo.

The month of September was, on the whole, a very favourable period, with bright sunshine, and comparatively little rain, these conditions making it possible to harvest the cereals in fair shape and complete the threshing operations in good order. The wheat crop gave a fair yield of the finest quality. The crop of field roots, and potatoes was harvested in excellent condition, and in most cases the yields were heavy.

The first autumn frost occurred on the night of the 11th, when 25·0° was recorded. The weather remained fine, and warm until the 20th, when the first real killing frost of the season was experienced, the mercury dropping to 17·5, making 14½ degrees of frost. All vegetables had been green, and flowers in bloom up to this date.

Fine open weather continued throughout the whole of the month of October, giving ample opportunity for the completion of much of the fall work. Owing to the absence of moisture in the soil, ploughing was possible until well towards the end of the month, a much longer period than usual. The dry soil necessitated the use of extra horse power to accomplish this work. Frost was recorded continually throughout the month, and a light precipitation, much below normal. A light flurry of snow occurred on the 16th, the first snow of the season, but very quickly disappeared.

November continued fine, and comparatively mild until the 20th, when a change to winter conditions was experienced. From the 1st to the 20th, it was possible to continue the outside work, and much was done in this period. All houses being replastered, and whitewashed; all stables put in readiness for winter; the stock brought in from the range; sufficient wood hauled and cut for the winter, wheels being used in this work. The first snow fell on the 20th, and light snow fell continuously until the evening of the 24th, there being 4 inches on the ground by the evening of that date, sufficient for fair sleighing. It remained moderately warm up to the 24th, when the temperature took a sudden drop, and on the morning of the 25th, 21·0° below zero was recorded, and on the following morning, -6.0° was registered. In the morning of the 27th, the thermometer showed above zero, with all the indications of a mild spell, and up to the 27th the percentage of feed used was very low, as many cattle, and horses were still out on the range.

In general, this season's conditions were exceptionally favourable to all crops, and the absence of frosts was particularly noticeable, as none were recorded at this Station after May 19th, date of first spring frost, to September 11, date of first autumn frost. The total precipitation for the four growing months, May 1st, to the end of August, was 7·96 inches. This, along with the snow of the winter, to the end of April, was ample for the production of good yields of straw, hay, and other crops.

TABLE OF METEOROLOGICAL OBSERVATIONS TAKEN AT FORT VERMILION, PEACE RIVER DISTRICT, ALBERTA, FROM APRIL 1, 1923 TO MARCH 31, 1924

Months	Maximum	Minimum	Range	Mean	Highest	Date	Lowest	Date	Rainfall	Snowfall	Total precipitation	Number of days precipitation	Heaviest in 24 hours	Date
	°	°	°	°	°		°		ins.	ins.	ins.		ins.	
April, 1923	43·98	13·78	30·20	28·88	67·8	25	−24·0	5	0·75	0·25	0·81	4	0·53	13
May	57·40	33·33	24·07	45·36	81·0	21	21·9	15	1·97	.....	1·97	6	1·36	28
June	73·02	47·77	25·24	60·39	88·5	14	36·9	9	0·84	.....	0·84	6	0·44	10
July	73·58	48·78	24·79	61·17	87·8	11	34·2	17	2·16	.....	2·16	9	1·36	21
August	68·53	44·46	24·06	56·49	82·0	11	35·0	7	2·99	.....	2·99	15	1·37	24
September	63·22	34·68	28·54	48·95	78·5	13	17·5	20	0·13	.....	0·13	4	0·07	10
October	52·38	24·18	28·14	38·25	76·2	1	3·0	31	0·10	0·30	0·13	3	0·07	14
November	29·98	11·51	18·42	20·72	50·9	5	−21·0	25	0·22	4·00	0·61	6	0·22	13
December	3·74	−14·85	18·60	−5·55	37·8	22	−34·2	29	.....	4·00	0·40	4	0·20	24
January, 1924	−3·04	−25·60	22·56	−14·32	29·0	20	−61·5	16	.....	10·50	1·05	4	0·35	31
February	14·77	−11·95	26·53	1·57	48·4	26	−37·0	19	.....	4·00	0·40	3	0·25	4
March	30·43	0·89	29·53	15·65	43·5	23	−34·0	31	.....	2·50	0·25	3	0·10	25,28
	.....	.....	.....	.....	.....	.....	.....	.....	9·20	25·55	11·74	67	.....	.....

SOME WEATHER OBSERVATIONS TAKEN AT THE CENTRAL EXPERIMENTAL FARM, OTTAWA, COMPARED WITH THOSE TAKEN AT FORT VERMILION, PEACE RIVER DISTRICT, ALBERTA

—	Mean temperature	Highest temperature	Lowest temperature	Total precipitation	Heaviest in 24 hours	Total hours sunshine	Average sunshine per day
	°	°	°				
April—							
Ottawa	38·24	81·0	−5·1	2·60	0·64	201·3	6·71
Fort Vermilion	28·88	67·8	−24·0	0·81	0·53	253·7	8·45
May—							
Ottawa	53·00	84·8	24·8	2·51	1·14	280·5	9·04
Fort Vermilion	45·36	81·0	21·9	1·97	1·36	287·6	9·27
June—							
Ottawa	66·27	94·8	39·8	4·87	1·06	247·6	8·25
Fort Vermilion	60·39	88·5	36·9	0·84	0·44	305·4	10·18
July—							
Ottawa	67·37	90·6	46·9	3·51	0·65	269·5	8·69
Fort Vermilion	61·17	87·8	34·2	2·16	1·36	327·0	10·54
August—							
Ottawa	64·63	87·8	40·0	3·06	1·01	274·1	8·84
Fort Vermilion	56·49	82·0	35·0	2·99	1·37	229·4	7·40
September—							
Ottawa	59·36	80·0	34·5	1·84	0·49	179·7	5·99
Fort Vermilion	48·95	78·5	17·5	0·13	0·07	223·8	7·46
October—							
Ottawa	47·06	71·0	21·8	3·57	1·73	158·9	5·12
Fort Vermilion	38·25	76·2	3·0	0·13	0·07	178·9	5·77
November—							
Ottawa	34·97	52·8	18·6	3·14	0·79	58·0	1·93
Fort Vermilion	20·72	50·9	−21·0	0·61	0·22	80·3	2·67
December—							
Ottawa	28·58	50·5	−5·0	3·01	0·60	72·5	2·33
Fort Vermilion	−5·55	37·8	−39·2	0·40	0·20	66·2	2·13
January—							
Ottawa	40·72	45·4	−29·8	5·45	0·75	94·6	3·05
Fort Vermilion	−14·32	29·0	−61·5	1·05	0·35	78·5	2·53
February—							
Ottawa	8·91	30·0	−12·4	2·74	1·05	154·5	5·32
Fort Vermilion	1·57	48·4	−37·0	0·40	0·25	110·8	3·82
March—							
Ottawa	29·06	50·4	3·0	0·93	0·30	150·7	4·86
Fort Vermilion	15·65	43·5	−34·0	0·25	0·10	166·3	5·36

RECORD OF SUNSHINE AT FORT VERMILION, PEACE RIVER DISTRICT, ALBERTA, FROM APRIL 1, 1923 TO MARCH 31, 1924

Months	Days with sunshine	Days without sunshine	Total hours sunshine	Average sunshine per day
1923				
April	29	1	253·7	8·45
May	29	2	287·6	9·27
June	29	1	305·4	10·18
July	31	0	327·0	10·54
August	28	3	229·4	7·40
September	30	0	223·8	7·46
October	28	3	178·9	5·77
November	20	10	80·3	2·67
December	18	13	66·2	2·13
1924				
January	24	7	78·5	2·53
February	22	7	110·8	3·82
March	29	2	166·3	5·36

ANIMAL HUSBANDRY

CATTLE

The small herd of pure-bred Shorthorn cattle are still in existence, and from a health point of view they have done quite well. The young bull, "Arctic Hero" has developed into a fine-sized animal, rather low, and blocky. He was two years old in October, and was not used to any great extent during the past summer. He was given every possible opportunity to grow, so that during the coming season he will be in demand. The cow "Rose Bell" dropped a fine heifer calf on December 31, 1923. We have some very promising young stock, the progeny of the original bull "Rose King", from some of our best grade cows. These should with proper care develop into fair dual-purpose cows.

SWINE

This herd has been cut down, until there are only nine head now in the herd, consisting of four of the choicest yearling gilts, four of the pick of the April litters and a new herd sire "Major Les, 2-65442", transferred from the Lacombe Experimental Station. Some of the young boars from spring litters were sold to the farmers of this district as breeding stock. The balance of the spring litters were fed, slaughtered, and consumed at the Station. The swine throughout this district continue to show signs of improvement.

SHEEP

The small flock of graded Oxford Down sheep that are maintained at this Station are in excellent condition, and from the ten ewes that came through the winter of 1922-1923, fourteen fine large lambs were born, nine ewes, and five rams (four pairs of twins, and six singles). Six of the oldest ewes, and all the wether lambs were slaughtered, for mutton and lamb for the different households at the Station.

HORTICULTURE

While the spring of 1923 was somewhat backward, and no seeding in the garden was done until May 8, after this date the weather conditions changed for the better, and the seeding of the vegetables was begun, with little, or no interruption from unfavourable weather conditions. The germination of most of the seeds was rapid, and fairly even, and one of the most marked features of the past season of 1923, from the standpoint of horticulture, was the long period without a killing frost—May 19th, to September 11th—so that no reseeding, or retransplanting was necessitated by the reason of frost. There was sufficient moisture to ensure good growth, and the moisture was fairly well distributed throughout the whole season.

VEGETABLES

CORN VARIETY TEST

Five varieties of garden corn were tested out this season. The land used was that on which a crop of field peas had been grown the previous season. The same amount of fertilizer, per acre was added, as for the field varieties, with similar method of preparation of the seed bed. The after cultivation was also the same. The seed was planted in hills 2½ feet apart each way at the rate of 12 pounds per acre.

The damage done to these varieties by the wire-worms was much greater than on the field corn plots, fully 55 per cent of the seed being destroyed, making the stand very thin, and the yield of fodder and cobs unsatisfactory.

While Howe's Alberta Flint is somewhat earlier than the Pickaninny, it is not to be compared with it as a table variety, as the Pickaninny is a real sweet corn, and much earlier than any other variety of sweet corn that has been tested out at this Station.

TEST OF VARIETIES OF GARDEN CORN PLANTED MAY 17

Variety	Seed	In tassel	In silk	Harvested	Length of stalk	Yield per acre	Remarks
					inches	tons lbs.	
Howe's Alberta Flint	University of Alta.	July 13	July 20	Sept. 14	36	1 1,360	Fit for use Aug. 22; stalks fairly mature, cobs small, fair percentage fully matured.
Pickaninny	C.E.F.	July 13	July 23	Sept. 14	46	2 860	Fit for use Aug. 20; stalks fairly green, a fair percentage of the cobs slightly glazed, balance in firm dough.
Malakoff	C.E.F.	July 26	July 23	Aug. 31	55	2 1,760	Just coming into silk, stalks quite green, cobs just forming some silk, fully tasseled.
Early Sweet Squaw	C.E.F.	June 26	Aug. 17	Aug. 31	64	2 1,400	Fully tasseled out, in silk, some small cobs in early milk, stalks quite green; stand very thin.
Black Mexican	C.E.F.	Aug. 14	Aug. 22	Aug. 31	58	9 360	Fully tasseled out, some silk. Cobs not sufficiently advanced to be of use, stalks very large and green. Far better stand than other varieties.

GARDEN BEANS

Seven varieties of string beans were sown on May 17 and 18, in drills 33 feet long and 30 feet apart. Of the seven varieties Davis White Wax was the earliest, although the Golden Wax heads the list in yield, both in green pods, and matured seed.

VARIETY TEST—GARDEN BEANS

Variety	Ready for use	Remarks
Davis White Wax	July 20	
Golden Wax	July 23	
Refugee	July 30	
Extra Early Red Valentine	July 26	This variety is a good green bean, the pods being long and very tender.
Willis Pilot	Aug. 15	Rather late, and of only medium quality.
Masterpiece (0·8955)	July 28	Pods of this variety large and comparatively stringless, making an excellent cooking variety.
Plentiful Wax (0·8957)	July 23	Pods of a medium size and of a very fine quality.

GARDEN BEETS

Seven varieties of table beets were tested out this season, in drills 33 feet long, and drills 24 inches apart. The plants were thinned out to 4 inches apart in the drills. The following are the dates of seeding, and time fit for use, with yields obtained when harvested on September 12.

None of the table beets were pulled for use until they had reached a fair size. The shortness of the time between the date of seeding, and the dates given as in use, may seem wonderful, or perhaps almost unbelievable, but long hours of sunshine, with ample rainfall the past season, and freedom from severe frost, made possible the rapid growth.

TEST OF VARIETIES—GARDEN BEETS

Variety	Seed	Sown	Fit for use	Yield per acre	Remarks
				tons lbs.	
Detroit Dark Red Table.	Rennie.....	May 9	July 13	16 640	Very fine smooth roots; a fair size when first fit for use.
Extra Early Flat Egyptian Table.	Rennie.....	May 9	July 15	22 1,120	Quite large, smooth roots, of a fair quality; of fair size when first fit for use.
Early Eclipse Table.....	Rennie.....	May 9	July 12	13 640	Medium sized, very smooth roots, very good quality; fair size when first fit for use.
Early Blood Red Table...	McKenzie.....	May 9	July 14	28 760	Roots very large, fairly smooth, but many of the roots were over large and coarse for table use.
Detroit Dark Red Table (0·2009).	C.E.F.....	May 19	July 24	10 1,480	Medium sized roots, very smooth; excellent table beet.
Model Crimson Globe Table.	Graham.....	May 19	July 16	20 480	Fair sized roots, very smooth; fair table variety.
Crosby's Egyptian Table.	Dupuy & Ferguson.	May 19	July 19	17 1,360	

CARROTS

Four varieties of table carrots were sown in uniform test plots of one sixtieth of an acre. The seed was sown with a hand seeder in drills 24 inches apart. The plants were thinned out to 2 inches apart in the drills, the germination of the seed was good, and the growth was rapid, good yields being obtained.

TEST OF VARIETIES—CARROTS

Variety	Seed	Date sown	Fit for use	Date harvested	Yield per acre	Remarks
					tons lbs.	
Chanteney Half Long	Rennie.....	May 9	July 6	Sept. 12	24 1,800	Roots smooth, crisp, and of a very fine quality.
Early Gem or Ox-heart.	Rennie.....	May 9	July 9	Sept. 12	17 520	Roots of a fair size, quite smooth, fair quality.
Chantenay (Ottawa, 2011).	C.E.F.....	May 19	July 23	Sept. 4	18 1,200	Roots of good size, very smooth, of an excellent quality; much the best table variety of the four.
Danvers Table.....	Dupuy & Ferguson.	May 19	July 25	Sept. 4	21 600	Roots very large, fairly smooth, of a fair quality.

LETTUCE

Eight varieties of lettuce were tested this season and frequent seedings made, starting May 8, with the last seeding on June 13. By this method fresh crisp lettuce was used throughout the whole season to August 3. In each case the germination of the seed was good, and the after-growth rapid. The following were the varieties under test, dates of seeding, and dates fit for use.

VARIETY TEST—LETTUCE

Variety	Seed	Date of seeding	Fit for use	Remarks
May King	McDonald	May 8	June 15	Of fair size; quality only medium. This is not a head variety, and is somewhat inclined to run to seed, and was not fit for use after July 20.
Salad Ice	McDonald	May 8	July 13	Of good size, and of very good quality, and later became fine large heads.
Grand Rapid	McDonald	May 19	June 15	No heads, but grew in fine large bunches of curled leaves, and was still in good condition on August 3.
Nonpareil Cabbage Head.	Rennie's	May 8	June 12	Of a very good size, June 12, and later developed fine large heads, remaining fit for use until well into the autumn.
Iceberg	Ewing's	May 19	June 14	Of a fair size when first picked, later developing splendid heads, compact, solid, crisp. This variety seems to have been the best this season.
Black Seeded Simpson.	Dreer	May 19	June 18	Of a medium size, June 18, no heads, but a mass of splendid leaves.
Black Seeded Simpson.	Vaughan	June 13	July 14	Sown for late summer use, quite large on July 14, no heads formed, but an abundance of fine crisp leaves, which continued in use until well towards the end of August.
Big Boston	Steele Briggs	May 1	May 20	This variety provided sufficient for a number of tables, until varieties sown in the open ground became fit for use.

RADISH

Eight varieties of radish were tested, the seeding being on many different dates, and by this method the dates of coming into use were extended well up to midsummer. The following were the varieties under test, dates sown, and dates coming into use.

VARIETY TEST—RADISH

Variety	Seed	Date sown	Fit for use	Remarks
French Breakfast	McDonald	May 8	June 2	Of a fair size June 2 and remained in use until July 12. Quality very good.
Scarlet Olive	McDonald	May 8	June 3	Of a medium size June 3 and of the finest quality. Remained in use until July 18.
White Icicle	McDonald	May 8	June 8	Quality fair. Remained in use until July 30.
White Tipped Early Scarlet.	Moore's	May 19	June 12	Quality very good. Remained in use until August 1.
Early Scarlet Turnip White Tipped.	Rennie's	May 17	June 15	Quality very good, and remained in use until August 4.
White Tipped	Steele Briggs	May 19	June 20	Quality good. Remained fit for table use until August 5.
XXX White Tipped.	Rennie's	June 13	July 4	This row, sown for mid-summer use, was of a fair size, and fit for use until well toward the end of August.
XXX White Tipped (sown under glass).	Rennie's	May 1	May 18	Crisp and tender.

PARSNIPS

An experiment in thinning to different distances was conducted this season, the Hollow Crown being the variety used. The seed was sown in the open ground on May 19, the roots harvested on September 14. The distances were 3 inches apart for the Hollow Crown No. 10, Ottawa seed, and 4 inches spacing for the Hollow Crown, Mackenzie seed. The four-inch spacing gave a larger yield than the three inch spacing.

PEAS

Thirteen varieties of garden peas were tested during the season of 1923.

This season, the Eight Weeks was much the earliest pea. Sutton's Excelsior gave the largest yield, both in green pods and matured seed, with Gradus a very close second.

VARIETY TEST—PEAS
Date of Seeding, May 18

Variety	Seed	Fit for use	Length of vine	Length of pod
			inches	inches
Sutton's Excelsior	Harris	July 17	23	3½
American Wonder	Carter's	July 18	38	3
Early Morn	Gregory	July 13	35	2½
Gradus	Carter's	July 15	38	3
McLean's Advancer, Ottawa 8927	C.E.F.	July 24	36	2½
Eight Weeks Garden	Carter's	July 10	21	2
Pioneer	Gregory	July 27	26	2½
Little Marvel	Graham	July 17	21	2
Gregory Surprise	Gregory	July 25	40	2

KOHL-RABI

Only one variety of kohl-rabi, Early White Vienna, was tested out this season, and good results were obtained.

EARLY WHITE VIENNA, (McDONALD SEED)

Date of seeding ....May 19.
Germination ....Good, 100 per cent.
Fit for use ....July 26 (fair size).
Date harvested ....September 12 (very large).
Yield per acre ....22 tons, 1,240 lbs.
(Roots thinned out to 6 inches apart)

GARDEN SPINACH

One variety, " Victoria " was tested. The quality was very good. The seed was sown on May 8, was fit for use on June 11, and remained in use throughout the summer, and early autumn. The plants reached a large size.

SWISS CHARD

Two drills of Giant Lucullus (McDonald Seed) were sown on May 8, and were fit for table use on June 19, when they were fine large plants. They remained in use the greater part of the summer, and when removed from the garden on September 21, were plants of very large size, giving a heavy yield.

PARSLEY

One drill of Champion Moss Curled (McDonald Seed) Parsley was sown on May 9, the germination of the seed was good, and the after-growth quite rapid. The plants were sufficiently large to be in use July 2, the quality being very good.

GARDEN HERBS

White English Mustard

Date of planting..... May 15.
Fit for use..... June 9.

Should be used before it comes into bloom.

Summer Savory

Date of seeding..... May 15.
Germination..... Poor.
Date pulled..... September 12.

The plants were thin in the row, and were fit for use on July 1.

Sweet Marjoram

Date of seeding..... May 15.
Germination..... Very good.
Fit for use..... June 30.
Date harvested..... September 12.
Yield from one row of 33 feet..... 6 pounds.

Pepper Grass

Date of seeding..... May 25.
Fit for use..... June 7.

If used while still small and tender, gives a fine flavour to many dishes.

CABBAGE SOWN IN OPEN

The following varieties of cabbage were sown in the open ground on May 15, two drills, 33 feet long, and 3 feet apart. The seeding was done with a hand seeder, the plants thinned out on June 14, to 18 inches apart in the row.

Variety Test of Cabbage—Sown in Open

Variety	Seed	Fit for use	Harvested	Yield	Remarks
Danish Ballhead.....	McDonald....	August 11..	September 21	50 heads, 295 lbs.	
Copenhagen.....	McDonald....	August 20..	September 21	47 heads, 67 lbs.	Heads very small and loose.

CHINESE OR "CELERY" CABBAGE, PE-TSAI, (STEELE BRIGGS)

Four drills of this early, and quick-growing vegetable were sown on May 15, and were fit for use on June 8. This vegetable produces a crisp celery-like head, and may be used as a salad, or cooked as cabbage, and makes a fair substitute in the early spring before the other salad plants are ready. It should be used at once, as it quickly comes into bloom.

GARDEN CABBAGE AND CAULIFLOWERS (Sown under glass)

The following varieties of cabbage and cauliflower were tested this season. The seed was sown under glass during the latter part of April, and transplanted to the open ground after all danger of frost had passed. Each variety was sown separately in small individual boxes with the bottoms perforated, which enabled the heat from the heated manure that had been placed in the bottom of the large hotbed to penetrate through the soil in the smaller boxes. These small boxes were placed on slats that lay on top of the manure in the hotbeds. This method was found to be very convenient, as in moving one of these small boxes, none of the other plants were disturbed and the boxes could be replaced in the frames to go on growing until needed again. This method used with all the hotbed plants, both vegetables and flowers, was found to be a decided success, and a vast improvement over the old method.

These cabbage are stored away for winter use, part with the roots cut off, and the heads placed on slatted shelves in the root cellar, and part with the roots trimmed, left on, tied and hung up. It has been found that cabbage kept better and longer hung up than laid on the slatted shelves, but for those with limited room, the shelves will do. In case they must be placed on shelves, it would be well to turn them frequently, but in no case should they be placed on top of one another.

VARIETY TEST OF CABBAGE—SOWN UNDER GLASS

Variety	Date sown	Seed	Transplanted to open	Fit for use	Remarks
Early Paris Market.	April 27	Dupuy & Ferguson.	June 1....	July 26..	Average weight of heads 8½ pounds. Plants set out large, no shades used.
Jersey Wakefield....	April 27	McDonald....	June 1....	July 23..	Average weight of heads 9½ pounds.
Copenhagen Market	April 27	McDonald....	June 1....	Aug. 17..	Average weight of heads 9½ pounds, quality very good.
Enkhinzan Glory...	April 30	Ewing.....	June 1....	Aug. 15..	Average weight of heads 10½ pounds. Heads rather loose, not good keepers.
Kildonan.....	April 27	Steele Briggs.	June 1....	Aug. 9..	Average weight of heads 10½ pounds. Heads very solid, quality good; a good keeper.
Marblehead Mammoth.	April 27	Ewing.....	June 1....	Aug. 10..	Average weight of heads 15½ pounds. Heads flat, solid, and compact, quality very good.
Mammoth Red Rock.	May 2	Rennie's.....	June 1....	Aug. 18..	Average weight of heads 9 pounds. Heads very solid, very good quality, medium size.
Danish Ballhead, Ottawa 9257.	May 2	C.E.F.....	June 1....	Sept. 1..	Average weight of heads 24½ pounds, very large and solid.

TEST OF VARIETIES—CAULIFLOWERS
Sown under Glass

Variety	Seed	Date sown	Transplanted to open	Fit for use	Remarks
Early Snowball.....	McDonald..	April 27..	June 1....	Aug. 8....	Average weight of heads 10 pounds. Heads solid, fine quality.
Extra Early Dwarf Erfurt.	McDonald..	April 27..	June 1....	Aug. 9....	Average weight of head 8½ pounds. Heads very fine, solid, good quality.

NOTE.—The heads seemed to have been late in forming this season, although the plants were extraordinarily large, but after forming, fine, large heads developed.

TEST OF VARIETIES—BORECOLE OR KALE

GREEN CURLED SCOTCH DWARF (MCDONALD)

Date sown under glass..... April 30.
Date transplanted to open ground..... June 1 (32 fine large plants).
Date fit for use..... July 16 (plants quite large).
Date harvested..... September 20.

The plot was used from quite freely all season, and when harvested the growth was very rank and a large amount was hauled from the plot and fed to the stock.

PARIS MARKET BRUSSELS SPROUTS (EWING SEED)

Date sown under glass..... April 30.
Date transplanted to open ground..... June 1 (medium-size plants).

None became sufficiently large to be of use, and although the greatest of care was given during the season, the sprouts were just forming on September 20. The seasons of this Northland seem to be too short for this variety of vegetable.

GARDEN ONIONS

Fourteen varieties of onions were tested out this season. The seeding was done on different dates, but it was proved that those seeded earliest gave the largest yield. The seed was sown in drills 33 feet long and 20 inches apart. The plants were thinned out to 2 inches in the rows. Some trouble was experienced this season with the white maggots, and in some cases the plots were severely injured, so that the yields obtained were very low as compared with a three-year average, and the quality, from a keeping standpoint, was very much below the average. The bulbs were of a medium size and rather immature, the frequent rains of the autumn keeping the onions in a green stage.

TEST OF VARIETIES—ONIONS

Variety	Seed	Date set out	Fit for use	Harvested	Remarks
Flat Yellow Danvers	McDonald	May 9	June 30	Sept. 7	Yield per acre, 38 bushels. Bulbs small and green, very thin on the plot.
Extra Select Large Red Wethersfield	McDonald	May 9	June 27 (fair)	Sept. 7	Yield per acre, 161 bushels. Bulbs of a fair size.
Extra Early Flat Red	McDonald	May 9	July 1 (medium)	Sept. 7	Yield per acre, 158 bushels.
Yellow Globe Danvers	McDonald	May 9	July 6 (fairly large)	Sept. 7	Yield per acre, 250 bushels. Bulbs of a fair size and in a better stage of maturity.
Extra Early Flat Red	McDonald	May 15	July 24 (medium)	Sept. 7	Yield per acre, 73 bushels. Bulbs small and immature.
Yellow Globe Danvers, Ottawa 2003	C.E.F	May 19	July 6 (medium)	Sept. 12	Yield, 2 drills, 15 pounds. Bulbs very small and green.
Southport Yellow Globe	Ewing	May 19	July 24 (very small)	Sept. 7	Yield from 2 drills, 3 pounds. Bulbs very small and green.
Ailsa Craig	Graham	May 19	July 2 (fair)	Sept. 12	Yield from 2 drills, 20 pounds. Quite large.
Australian Brown	McDonald	May 19	July 25 (very small)	Sept. 12	Yield from 4 drills, 8 pounds. Very small and immature.
					All of the plots sown on the later dates suffered to a greater extent from the root maggots than the earlier-sown plots.
Large Red Wethersfield, Ottawa 1930	C.E.F	May 19	July 25 (small)	Sept. 7	Yield from 4 drills, 16 pounds. Small and green.
Giant Yellow Prize Taker	Graham	May 19	July 26 (quite small)	Sept. 7	Yield from 2 drills, 14 pounds. Medium size.
Silver King	Graham	May 19	July 12 (quite small)	Sept. 7	Yield from 3 drills, 7 pounds. Very small and green.
Southport Red Globe	Steele Briggs	May 19	July 24 (fair)	Sept. 7	Yield from 2 drills, 9 pounds. Medium size.

TEST OF VARIETIES—ONION SETS

The results obtained this season from the onion sets were rather unsatisfactory. The reason is partly accounted for by the bulbs being so closely packed for transit, and the length of time taken to reach this Station, when ordered from a distance, as considerable growth had taken place during that time, and the vitality of the bulbs had been lowered and many entirely ruined. Should the weather conditions at the time of setting out of the bulbs not be favourable, a further loss may be sustained.

Four drills of each variety were set out on May 18 and 22. The drills 33 feet long and 2 feet apart. The sets placed 4 inches apart in the rows.

TEST OF VARIETIES—ONION SETS

Variety	Seed	Date set out	Fit for use	Harvested	Yield	Remarks
					lbs.	
Yellow	McDonald	May 18	July 2	Sept. 3	50	Medium size.
Red	McDonald	May 18	July 5	Sept. 3	30	Quite large; thin on the plot.
White	McDonald	May 18	July 6	Sept. 3	30	Medium size; very poor quality as they were decayed when taken up.
Red	Steele Briggs.	May 22	July 7	Sept. 14	17	Very small, poor quality.

GROWING ONIONS FOR SETS

Date of seeding.....June 1.
Size of the plot.....Five drills, 33 feet long, 20 inches apart.
Date harvested.....September 12.
Yield from the plot.....42 pounds, small, and 28 pounds, medium.

These two plots were sown on a different part of the onion field and escaped the ravages of the maggots.

The seeding on the plot was done very thickly to produce, if possible fully matured, small onions, to be used as sets the following season. The necessary cultivation was given this plot, but no thinning of the plants was done.

CELERY

All varieties of celery were sown under glass on April 27. The germination of the seed was slow, and the transplanting was not done until June 19, when the plants were yet quite small. The growth of the plants was very slow for some time after being transplanted, more especially those planted on the level. It was found that in all cases, both this season and in the past, that celery of a far superior quality, might be obtained from the earth method of blanching, although this entails considerably more labour. But in this Northland, with its short seasons, we believe the trench method to be the best, both for the shade, and because it enables the plants to get the full benefit of any water that may be given them during a dry period. In using celery, the superior quality acquired by the earthing method is well worth the extra labour.

The following varieties were planted in trenches 2 feet wide, 18 inches deep, with 4 inches of well-rotted manure placed in the bottom of the trench and 3 inches of soil on top of the manure; the young plants were set in this soil.

COMPARISON OF DIFFERENT METHODS OF BLANCHING CELERY

Golden Self Blanching Celery

Size of the plot.....6 by 6 feet, plants 6 inches by 6 inches apart.
Length of stalks when harvested.....11 inches.
Weight of 12 plants trimmed.....7½ pounds.
Date harvested.....September 21.
Total weight from plot.....64½ pounds.

This celery was very poorly blanched, and not being protected by earth, was slightly frosted when dug, which greatly impaired its quality, both for table use, and for keeping.

Winter Queen Celery

Size of the plot.....1 row, 15 feet long, plants 6 inches apart, grown on the level, and earthed up as usual.
Fit for use.....September 1.
Length of stalks when harvested.....13 inches.
Weight of 12 plants trimmed.....9¾ pounds.
Date harvested.....September 22.
Total weight of row.....22 pounds.

Earliness, medium. Crispness, very good. Blanching, thoroughly blanched. Flavour, very good.

White Plume Celery

Size of the plot.....2 rows, each 15 feet long, plants alternating, blanched with ready roofing.

The roofing was placed above the plants on July 28, and was fully 18 inches high from the ground, to top of pitch. Perhaps it was not realized fully the great heat that might be, and was created, with the result that the plants were badly burned before they were sufficiently large to be of use, so that the results obtained were very disappointing.

For the coming season, frames will be made with the roofing nailed on permanently, and sufficiently high, so that there will be no danger of burning, and will be handier in moving, and replacing when watering the plants.

Paris Golden Celery

Size of the plot.....1 row 15 feet long, plants 6 inches apart. Plants started in a trench 6 inches deep, and gradually earthed up.
Earthing up started.....July 24.
Fit for use.....August 30, medium size then.
Length of stalk when dug.....12 inches.
Date dug.....September 21.
Total weight of row.....13 pounds.

Keeping quality, good. Earliness fair. Crispness, good. Blanching, well blanched. Flavour, very good.

White Plume Celery

Size of the plot.....1 row 15 feet long, plants 6 inches apart. Plants grown on the level, and blanched with boards.

The boards were placed over the plants on July 25. The results obtained from the test were very unsatisfactory. Permanent covers will have to be made for this experiment for the coming season.

VARIETY TEST—CELERY

Variety	Seed	Fit for use	Length of stock	Harvested	Remarks
Golden Self Blanching.	Ottawa 229-230.	Aug. 28	16 inches	Sept. 21	Quite an early variety, very crisp, well blanched, fine flavour.
White Plume.....	Graham....	Aug. 29	14 inches.	Sept. 21	Earliness medium, fair crispness, thoroughly blanched, flavour good.
Paris Golden.....	Graham....	Aug. 26	15 inches.	Sept. 22	The earliest variety, very crisp, nicely blanched, and of a very fine flavour.
Winter Queen.....	Graham....	Sept. 4	14 inches.	Sept. 22	A later variety; quite crisp, and well blanched; flavour very good

GARDEN PEPPERS

The following varieties of peppers were sown under glass on April 30, and transplanted to the open ground on June 7. The plants were quite small when set out, and the growth rather slow and backward throughout the whole season. The results obtained being much below the average.

VARIETY TEST—PEPPERS

Variety	Seed	Date set out	Amount picked	Remarks
			lbs.	
Neapolitan.....	Summerland 944	June 7 (35 plants)	6	Fair-sized green pods. None of the pods ripened.
Harris Early.....	Summerland 945	June 7 (35 plants)	4½	Medium-sized green pods. No bloom appeared until July 30. No ripe pods.
Small Red Chili...	McDonald.....	June 7 (35 plants)	None	No bloom appeared until August 11, so that the pods were just forming when the frost of September occurred.

GARDEN PUMPKINS

Three varieties of pumpkin were under test. This season the hills of pumpkin seed were placed 10 feet apart each way, but by reason of the lateness of the opening up of the spring, and through press of other work, the dates of seeding of all the cucurbitaceous plants were somewhat later than usual. With the very favourable weather conditions which followed, the results obtained from all the varieties were quite satisfactory. The following were the dates of planting, and yields obtained when harvested.

VARIETY TEST—PUMPKINS

Variety	Seed	Planted	Picked	Bloomed	Remarks
King of the Mammoth	McDonald..	May 17	Sept. 3	July 16	Largest of the 18 pumpkins harvested weighed 33 pounds and was fully matured.
Large Connecticut Field.	McDonald..	May 17	Sept. 3	July 12	Amount picked 28 very fine pumpkins. Largest weighed 24 pounds. Those picked on August 28 weighed 15 pounds and were fully matured.
Small Sugar.....	McDonald..	May 17	Sept. 3	July 18	Amount picked 74 very good pumpkins.

VARIETY TEST—SQUASH

Variety	Seed	Planted	Bloomed	Fit for use	Remarks
Long White Bush Marrow.	McDonald..	May 17	July 5	Aug. 2	Thirty large, fully-matured squash. Largest weighed 14 pounds. Hills 6 by 6 feet apart.
English Vegetable Marrow.	McDonald..	May 17	July 12	July 31	Fifty-three excellent marrows. Largest weighed 18 pounds, fully matured, and of a fine flavour.
Golden Hubbard	McDonald..	May 17	July 25	Aug. 17	Twenty large squash. Largest weighed 14 pounds.

CUCUMBERS

Four varieties of cucumbers were tested this season. The seed was sown in the usual way, in little boxes placed over a previously prepared bed of heated manure, with 3 inches of good garden soil over the manure. These boxes have glass placed over them which is removed during the day, and replaced again in the evening. When all danger of frost is past, and the plants have become well established, and perhaps overflowing, the boxes are then removed, and cultivation starts.

VARIETY TEST—CUCUMBERS

Variety	Seed	Planted	Bloomed	Fit for use	Remarks
Improved Long Green	McDonald..	May 17	July 11	Aug. 5	Total amount picked, 157 of good quality.
Giant Pera.....	McDonald..	May 17	July 12	Aug. 5	Total amount picked, 88, all of good quality.
West Indian Gherkin.	Burpee.....	May 17	July 12	Aug. 18	Total amount picked, 22 fair-sized cucumbers. This variety though small is excellent for pickling.
Japanese Climbing....	McDonald..	May 17	July 12	Aug. 17	Total amount picked, 79 from the 3 hills. The finest quality and prolific.

GARDEN TOMATOES

The variety tests in tomatoes were carried out as usual, and in addition some cultural work was done this season.

The seed was sown under glass on April 27, and 30 and transplanting was not done until June 6, at which date all danger of frost was past. The plants were then large, as they had been thinned out in the little individual boxes, giving them plenty of room to develop. The plants were placed 4 inches apart in the rows, and the rows 4 feet apart. The pruning, and staking commenced on July 18, and the pruning and trimming were carried on at intervals throughout the season, or until it was noticed that any of the fruit showed signs of changing colour. During the latter part of August, a small percentage of ripe fruit was picked from each variety, but the cloudy, rainy weather that prevailed throughout the whole of this month of August prevented a large percentage of fruit from ripening.

It was found this season that in this Northland while tying to stakes and pruning, considerably hastens maturity, they leave the fruit exposed to the early autumn frost (as was the case this season). These early frosts are usually followed by a week or two of warm weather, and usually injure only the tips of the unpruned plants, leaving the fruit uninjured. Often the unpruned plants will ripen considerable fruit before the succeeding frosts, while the fruit on the plants tied up to the stakes and pruned may be badly injured by the first early frost.

VARIETY TEST—TOMATOES

Variety	Seed	Set out	First ripe fruit	Amount Fruit		Remarks
				Ripe	Green	
				lb.	lb.	
Danish Export, Ottawa 722.	C.E.F..	June 6 (30 plants).	Aug. 22	20	87	Fruit large and smooth; pruned to a single stem, and one truss of fruit.
Alacrity X Earlibell, Ottawa 711.	C.E.F..	June 6 (30 plants).	Aug. 24	23	90	Fruit large, smooth, of excellent quality; pruned to a single stem, and not headed back.
Chalk's Jewel, Ottawa 719.	C.E.F..	June 7 (30 plants).	Aug. 28	12	96	Fruit very large and smooth; single stem stopped to 2nd truss of fruit.
Burbank's Early, Ottawa 732.	C.E.F..	June 6 (30 plants).	Aug. 30	7	55	While the yield from this variety was not as heavy as from most of the other varieties, the fruit was much larger, very smooth, and of a good quality; single stem stopped to 3rd truss of fruit.
Crimson Canner, Ottawa 707.	C.E.F..	June 7 (30 plants).	.....	.....	107	Two stems staked and tied, just headed back, not pruned, and allowed to develop bunches of fruit without restriction. No ripe fruit.
John Baer.....	Carter..	June 7.....	Aug. 28	16	284	Not pruned or tied. Fruit quite large and of fine quality.

POTATOES

Five varieties of potatoes were tested in 1923, the plots being one-eighth of an acre. These crops were grown on land which had raised a crop of grain the previous season. In the autumn of 1922, manure at the rate of 20 wagon loads per acre was applied, the land then ploughed, and left in that condition for the winter. In the spring of 1923 the land was thoroughly, and deeply worked with a spring-tooth harrow, which thoroughly incorporated the manure with the soil. Finally the land was smoothed over with the smoothing harrow. The drills were then ploughed out quite deeply. This being done a few days previous to the planting, gave the soil in the bottom of the drills a chance to warm up. Planting was on May 8 to May 10. It has been proven that in this Northland, with its limited rainfall, that better, surer results may be obtained in early and deep planting (other conditions being equal such as good sound large seed). The cultural method followed at this Station in handling the potato crop, has been early, deep planting; fairly large seed; the seed covered lightly by hand hoes; and then at frequent intervals, the harrows run over the plots crossways of the drills, this harrowing being done more especially should there be any possible danger of a frost to cover the young plants that may be just breaking through the ground. This frequent harrowing also keeps all weeds in check. As soon as the plants in the drills are well above the ground, the horse cultivator is started. Usually the plots are gone over twice with the cultivator, then later with the hand hoes. In this operation, all weeds are removed from among the potatoes, which are slightly hilled up, high hilling not being necessary.

This season the drills were ploughed out 3 feet apart. After very carefully selecting, the seed was cut into sets containing two eyes, and the sets dropped 12 inches apart in the drills. The potato crop throughout this district was very good this season.

VARIETY TEST—POTATOES

(Planted May 8, 9 and 10)

Variety	In bloom	Fit for use	Yield per acre		Remarks
			bush.	lbs.	
Rochester Rose	July 5	July 14	418	8	Colour, red; shape, oval; size, very large, and only a very small percentage of small tubers.
Carman No. 1	July 6	Aug. 9	392	..	Colour, white; shape, flattish-oval. Tubers very large, with comparatively none that could be called unmarketable.
Gold Coin	July 8	Aug. 7	405	4	Colour, white; shape, round, and of a very uniform size.
Irish Cobbler	July 5	July 30	339	44	Colour, white; shape, flattish-oval; size, very large.
King Edward	July 8	July 27	405	4	Colour, russet; shape, longish-oval. The tubers from this plot were very large, many weighing 2½ pounds, sound, and a good quality.

COST OF GROWING A CROP OF POTATOES

One-quarter of an acre of potatoes was planted on May 12, on ground that had grown a crop of green feed, a mixture of oats and peas, the previous season and was manured just before ploughing at the rate of twenty-eight wagon loads of well-rotted manure per acre. The rows were 3 feet apart, and the sets were dropped about one foot apart in the rows. With the very favourable weather conditions of the season, the growth was good and fairly rapid, and the yield very good, the tubers being large, uniform in size, quite smooth, and free from scab.

The following statement covers cost of production. It will be noticed that no charge was made for use of machinery, as this was included in charges for team work, and no value put on the manure; just the charge for hauling.

COST OF PRODUCTION OF POTATOES

Rent of land, ¼ acre, at $10 per acre		$2 50
Cost of seed, 3½ bushels, 210 pounds, at 2 cents per pound		4 20
Manure hauling:—(28 loads per acre), 7 loads.		
Team, at 45 cents per hour, 4 hours	$1 80	
Man, at 35 cents per hour, 4 hours	1 40	
		3 20
Ploughing:—		
Man and team ploughing the plot, 2½ hours	$2 00	
2 men and team ploughing the furrows, 1½ hours	1 72½	
2 men and team ploughing out potatoes	2 30	
		6 02½
Harrowing:—		
Man and team, harrowing plot, 1 hour	$0 80	
Man and team, harrowing plot, ½ hour	0 40	
		1 20
Planting and covering:—		
Two men, 5 hours, at 35 cents per hour		3 50
Cultivating:—		
Two men and one horse, 1½ hours, June 25		0 86½
Weeding and hoeing:—		
One man, ½ day (10 hours), 5 hours, June 26		1 75
Hilling:—		
One man, 1 day (10 hours), July 4		3 50
Hauling and storing:—		
Two men and team, ½ day (5 hours)	$5 75	
Picking and sacking:—		
7 men, 5 hours each	20 32	
		$26 07
		$52 81

Total cost per ¼ acre	$52.81.
Yield per ¼ acre	125 bushels.
Cost per bushel	42 cents.
Proceeds per ¼ acre at 90 cents	$112.50.

RHUBARB

The older planting of Victoria rhubarb yielded this season a good crop of fine large stalks, of a rich colour, very tender and crisp. Although the older bed showed a slight tendency to produce seed this season, this did not impair the quality. The mulching was removed during the early part of May, and the plants were sufficiently large to use on June 3, and still in use on September 1.

LEEKS

The following varieties of leeks were tested this season, with very good results. The roots were dug on September 22, and stored away until spring, when they will be transplanted into permanent beds.

VARIETY TEST—LEEKS

Seed sown May 19

Variety	Seed	Size drill	Fit for use	Yield from plot
		feet		lbs.
London Flag	McDonald	54	Aug. 29	75
Musselburgh	Graham	54	Aug. 27	65

ASPARAGUS

The plantation of Conovers Colossal yielded fairly well again this season, by producing a crop of strong large shoots of good quality, that were fit for table use on June 3.

JERUSALEM ARTICHOKES

The artichokes have now reached a fair size. They were fit for use on August 24.

HORSE RADISH

The horse radish roots have done very well, and in the two seasons that they have been grown, a large amount has been distributed throughout the district.

THE FLOWER GARDEN

The flowers, annuals, perennials, and bulbs, made a very excellent showing again this season. They were planted this year in a new location, with a Carragana hedge on the north side, and a low hedge of Manitoba maples on the south. This made an ideal spot for a flower garden. The more tender varieties were sown under glass during the latter part of April, and the beginning of May, these being transplanted to the open ground after all danger of frost was past. The hardier varieties were sown in the open ground. Through the press of other work, the preparation of the flower garden was somewhat later than usual, but with the very favourable weather conditions through the season, the plants made rapid growth, and many of them came into bloom at about the usual time, and with the frost-free autumn, they remained in bloom for a long period, or until the first real killing frost, which occurred on September 20. The older flower garden, with its many volunteer plants of many different shades and colours made of itself a very fine display. This garden we kept trimmed, and clean, as most of the perennials remained in this plot.

ASTERS

The transplanting to the open started on June 7, and all were very large plants with many bunches when blooming started on August 9. The Vicks seed showed a slightly higher percentage of germination, with the Suttons a close second. The after-growth of all varieties was about equal for size of plants, and number of blooms.

ASTERS

Names of Varieties	Date of bloom	Remarks
Seed from Vicks—		
Late Branching Purple	Aug. 9	Fine showing.
Late Branching Dark Violet	" 12	Excellent showing.
Late Branching Rose	" 10	Large, many fine blooms.
Seed from McDonald—		
Ostrich Plume	" 15	Fine display.
Giant Comet	" 20	Plants large, with many branches covered with fine blooms.
Paeony	" 9	Plants large with an abundance of blooms.
Seed from Central Exp. Farm—		
Mikado	" 22	Good showing.
Late Upright Mixed	" 19	A fine showing of colours.
Comet Mixed	" 20	Fine large blooms.
Seed from Summerland—		
Carmine Perfection	" 18	Excellent showing.
Late Branching Lavender	" 18	Fine display.
Early Branching White	" 20	Excellent white blooms.
Seed from Suttons—		
Primrose Queen	" 10	An Abundance of fine bloom.
Blushing Beauty	" 12	Fine showing.
King of the Belgians	" 15	Good display.

ANTIRRHINUM

The antirrhinums (Sutton's seed) sown under glass on May 2, and transplanted to the open ground on June 7, when the plants were quite large. The germination was good, and the plants large when they came into bloom.

ANTIRRHINUM

Name of Variety	Date of bloom	Remarks
Tall Mixed Antirrhinum	July 12	Very good blooms.
Intermediate Mixed Antirrhinum	" 16	Fine display.
Fire King Antirrhinum	" 14	Large plants, fine blooms.

ADONIS AESTIVALIS *(Pheasants Eye)*

Plants (from McDonald's seed) which seeded themselves in the old garden were in bloom June 24; plants from the spring seeding, in bloom August 31. These plants are very hardy, can stand many degrees of frost, and if pulled w continue blooming until well into the winter, making at any time a fine display.

VARIETY TEST—ANNUALS

Name of Plant, Seed, Source and Variety	Date of bloom	Remarks
ALONSOA, Suttons. Warscewiczii compacta	Aug. 17	Pretty, but small.
ALYSSUM, Steele Briggs	July 22	Fair showing.
AMARANTHUS, Suttons, Tricolour, Love-lies-bleeding.		Effective plant for a background.
AMARANTHUS, Suttons. Purple		Fine effect.
BALSAM, Suttons, Mixed colours, Lady's Slipper.		Transplanted to pots June 9th. Placed in the windows of the house.
BARTONIA AUREA, Suttons	July 7	Plants very large, and bloomed profusely until autumn, make a fine table decoration.
BRACHYCOME, Summerland seed Swan River Daisy.	" 26	Fine showing of bloom.
CANDYTUFT, Steele Briggs, Mixed	" 18	In the old flower garden from seed from the previous season. Fine display.
CANDYTUFT, Suttons, Sweet-scented	June 16	Very fine showing.
CELOSIA PLUMOSA, Suttons, Mixed Colours	" 16	Set out June 9. Brilliant foliage, fine display.
COSMOS, Mixed, Our own seed	" 22	Set out June 1. These plants became very large, and bloomed profusely all summer, till late autumn, and made an excellent display, also a fine table decoration.
CANARY BIRD VINE, McDonald, Tropaeolum Canariense.	Aug. 11	These were planted in a round bed on May 21, and trained to climb up twine leaning to the centre of the bed. The plant reached a good length, and made a fine display, when it became covered with its yellow bird like bloom.
WILD CUCUMBER VINE, McDonald, Echinocystis Lobata.		Planted on May 21, one end around the rustic work, and by midsummer had become fine large vines.
CYPRESS VINE, McDonald, Ipomoea Quamoclit.	July 20	These were grown in the window.
CARDINAL CLIMBER, McDonald, Ipomoea Cardinalis.	" 19	Sown under glass May 16, potted on June 10, and set in the office window with wire placed for them to climb. The growth was good and made a very fine showing with little red trumpet-like blooms.
CONVOLVULUS, Steele Briggs, Major, Morning Glory.	" 18	Sown in a box, and placed in the window of the office on May 2, they made rapid growth, and a fine display. Remained in bloom till end of October.
CLARKIA, Steele Briggs, Elegans	" 18	In old garden. Very good.
CENTAUREA, Steele Briggs, Imperalis	" 16	Very fine showing.
CHRYSANTHEMUM, Our own seed	" 23	Fine blooms.

VARIETY TEST—ANNUALS—*Continued*

Name of Plant, Seed, Source and Variety	Date of bloom	Remarks
CHRYSANTHEMUM, McDonald, Inodorum, Snowball.	" 23	Blooms fine and large, colour white, very useful as cuttings, and pretty border plant,
DAHLIA, McDonald, Double Mixed	Aug. 20	Sown under glass on April 30, set out June 10. very fine large plants, blooms large, many coloured. A very fine display.
DATURA, Steele Briggs, Golden Queen (Angel's Trumpet).	" 29	Set out on June 10, the trumpet-like blooms, with their pretty markings, made a very fine showing.
DIMORPHOTHECA, Suttons, Star of the Veldt	July 24	Very good.
ESCHSCHOLTZIA, Our own seed, California Poppy.	" 17	A very fine showing. Had reseeded themselves in the old garden.
ENGLISH DAISY, Our own seed, Bellis Perennis	Aug. 2	From seedlings of a low-growing habit. Makes a fine border.
GODETIA, Steele Briggs, Satin-flowered, Mixed.	July 30	Sown May 21. Fine large plants, which bloomed most profusely and made a most excellent display.
GYPSOPHILA, Our own seed, Elegans	June 26	Came into bloom from it's own seeding, with fine effect.
GYPSOPHILA, Cap Rouge seed	July 4	Sown in a border on May 22, and made a fine display.
HELICHRYSUM, Suttons. Mixed Straw Flower.	Aug. 10	Sown May 22. Very fine showing.
HELICHRYSUM, McDonald	" 21	Very fine display.
HELICHRYSUM, Steele Briggs	" 10	The blooms all gathered just previous to the severe frost, were used for winter house decoration, and winter bouquets. For the latter purpose, they should be gathered before being fully open.
JACOBEA, McDonald, Senecio, Elegans double	July 30	Very good showing.
KENILWORTH IVY, Steele Briggs	" 7	Sown under glass May 2; set in hanging baskets on June 10; and were kept indoors.
KOCHIA, McDonald, Burning Bush, Tricophylla.		Started under glass this season, and set out on June 7, these plants made rapid growth, and are for ornamental purposes in a garden hard to beat, with graceful, finely cut, and tender green foliage which changes to a rich, russet crimson in the autumn.
LAVATERA, Suttons, Annual Mallow	July 26	This bell-shaped flower with fine pink shades, makes an excellent showing.
LINARIA, Suttons. Toadflax Mixed	" 1	Plants in the old garden were in bloom June 22, and plants from new seeding July 1. Both gave a mass of beautiful coloured blooms, throughout the season. They are very hardy, and withstand considerable frost, both spring, and autumn.
MARIGOLD, Suttons, African	Aug. 10	Fair showing.
MARIGOLD, Suttons, Single Tagetes	" 20	Good showing.
MARIGOLD, Burpee seed, Double French	" 1	Fine display.
MIGNONETTE, Rennie Defiance	" 1	Pretty.
MALOPE, Mallow, Suttons	July 23	Attractive.
NICOTIANA, Suttons, Affinis, Mixed Hybrids	" 22	Sown under glass April 30, set out June 11 This plant with it's sweet-scented, white, star-shaped flower makes a splendid display.
NEMESIA, Suttons, Fire King	" 28	Good showing.
NASTURTIUM, Suttons, Fire King, Tall	" 24	Very fine.
NASTURTIUM, Suttons, Ruby King, Dwarf	" 26	Good showing.
NASTURTIUM, Suttons, Salmon Pink, Dwarf	" 25	Very fine show.
NASTURTIUM, Suttons, Crystal Palace Gem, Dwarf.	" 30	Very fine blooms.
NASTURTIUM, Suttons, Cearuleum Roseum, Dwarf.	Aug. 4	Very good.
NASTURTIUM, Suttons, Empress of India, Dwarf.	" 6	Fine showing.
NASTURTIUM, Suttons, Scarlet, The King, Dwarf.	" 2	Very good show.
PANSIES, Our own seed	July 28	Fine array of blooms.
PHLOX DRUMMONDII, Suttons, Salmon Rose	July 23	Abundance of blooms, very pretty.
PHLOX DRUMMONDII, Suttons, Blue, White Eye	" 14	Excellent showing.
PHLOX DRUMMONDII, Suttons, Deep Crimson.	" 12	Very excellent show.
PHLOX DRUMMONDII, Suttons, Pure White	" 10	Very pretty.
PHLOX DRUMMONDII, Summerland, Deep Crimson.	" 12	Very fine.

VARIETY TEST—ANNUALS—*Continued*

Name of Plant, Seed, Source and Variety	Date of bloom	Remarks
NOTE.—Five special colours of Phlox were sown under glass on May 2, and were transplanted out on June 7. The plants made good growth, and gave a wonderful display of flowers.		
PETUNIAS, Steele Briggs, Mixed	" 23	A splendid showing. Sown under glass April 30. Set out June 10.
POPPIES, C.E.F. seed, Shirley Mixed	" 16	Sown in open ground, May 22. Bloomed profusely, beautiful display.
POPPIES, our own seed, double, Snowdrift	" 16	Pure white flowers. Very pretty.
PORTULACA, C.E.F. seed	" 17	Brilliant dwarf hardy annual. Bloomed profusely from early summer to autumn.
SALPIGLOSSIS, Suttons, Mixed Colours	" 10	Sown under glass April 30, set out June 9. Trumpet-shaped flowers of varied colours, beautifully veined. Fine showing.
SAPLIGLOSSIS, Steele Briggs, Emperor	" 10	Set out June 9. Very fine showing.
SCABIOUS, C.E.F. seed, Mixed	Aug. 25	Sown in open, May 23. Fair showing.
SCHIZANTHUS, Rennie, Butterfly Flower	July 16	Free flowering. Beautiful appearance.
SWEET SULTAN GIANT, Suttons, Centaurea Moschata.	" 16	Very fine table decoration. Many colours.
SCARLET RUNNERS, McDonald, Beans	" 4	Fine flowering climber.
STOCKS, Yellow, Dobbie's	" 7	Very fine bloom, large plants.
STOCKS, Carmine, Dobbie's	" 11	Lovely colours.
STOCKS, Purple, Dobbie's	" 4	Profusion of bloom.
STOCKS, Violet, Dobbie's	" 17	Wonderful display.
STOCKS, Blood Red, Dobbie's	" 13	Very brilliant colouring.
STOCKS, Light Blue, Dobbie's	" 18	Very fine.
STOCKS, Canary Yellow, Dobbie's	" 31	Good showing.
STOCKS, Brilliant Rose, Dobbie's	" 6	Excellent array of bloom.
STOCKS, Pure White, Dobbie's	" 28	Mixed with other colours made a very fine showing.
STOCKS, Old Rose, Dobbie's	" 7	Splendid showing.
NOTE.—This collection of stocks was sown under glass May 2, transplanted to the open June 7, and with careful handling in setting out, received no check, made fine growth, and came into bloom in a comparatively short time. With the many different colours they made an excellent display, and were still in bloom when cut down by the frost in the late autumn.		
SWEET PEAS, best Waved type (Sydenham seed) SWEET PEAS, collection of Burpee's. SWEET PEAS, best Grandiflora type (Sydenham seed). SWEET PEAS, Cupid Mixed, Steele Briggs	.....	These were planted on May 25, in a more open position, and made good growth, bloomed most profusely from August 8 until the late autumn, and made a very excellent showing.
NOTE.—Sweet peas made only a fair growth this season; the position in which they were sown was rather too sheltered, but this was not realized until the shrubbery had become fully leafed out, therefore they were somewhat stunted in growth, and late coming into bloom. It was not until August 22 that blooming started, but from that date till the frost they were covered with blooms, and in spite of all, made a fairly good showing.		
TAGETES, Golden Gem, Suttons, Signata Pumila.	July 28	Fair amount of bloom.
VERBENA, Blue, Suttons	" 12	Fine showing.
VERBENA, White, Suttons	" 8	Very fine display. The Verbenas were sown under glass on April 30, set out June 22, the plants being quite large on this date. They made rapid growth, and came into bloom quickly.
VIRGINIAN STOCK, Suttons	" 4	Fair showing.
ZINNIA, C.E.F. seed, Giant Canary Yellow	" 17	Blooms quite large; very fine display.

THE PERENNIALS

The perennial flowers, and bulbs made a splendid showing again this season, the different varieties giving a continuous bloom for a relatively long season.

VARIETY TEST—PERENNIALS

Name of Variety	Date of bloom	Remarks
AQUILEGIA, Columbine	June 16	Made a very fine display.
ACHILLEA, The Pearl	" 10	A fair display, almost the first to bloom.
ARABIS, Rock Cress	" 14	Very pretty.
DAHLIA, 1922 roots	Aug. 4	Fine large plants, blooms very large, various colours made a very fine showing.
DIANTHUS, HEDDEWIGH	July 14	Very pretty showing.
DIANTHUS, IMPERIALIS	" 8	Very fine as cut flowers.
DELPHINIUM, Larkspur	June 28	Very fine display, with the many different colours.
GALLARDIA	July 24	Sown under glass on May 2, set out June 22. A number of new varieties, with fine large heads, gave a profusion of bloom for the remainder of the season, and made a fine showing.
GAS PLANT, Fraxinella Dictamus	June 22	The older plant, with seedlings, made an excellent display.
HESPERIS MATUOMATIS	" 8	Very fine.
LYCHNIS	" 24	Brilliant display of scarlet blooms.
PANSIES	May 6	Came into bloom almost as soon as the snow had disappeared.
POPPIES, Iceland, Nudicaule	June 1	Masses of many different colours, which made a fine effect, and were still in bloom at the end of October.
POPPIES, Orientale, Hybrids	" 4	Great showing of bloom.
SHASTA DAISY	" 15	The pretty white flower is quite effective.
RUDBECKIA	July 16	
GLADIOLI, and other bulbs		Gladiolus corms taken from the cellar, and set out on May 23, the corms were planted between the annual flowering plants. At the first slight frost on September 11, the corms were dug up, and stored away for the winter.
PEONIE, Charlemagne		Root dug in spring, divided into a number of pieces, and planted in a new position on May 23. It made good growth, and came into bloom on July 8, and made a splendid showing with its pure white bloom of a large size.
PAEONIE, White	July 8	Excellent showing.
ROSE, Delicto Double	June 27	Pink. Bloomed profusely until late autumn, beautiful show.
ROSE, Rugosa, Double	" 21	Dark red. These bushes are very large, and produced a large number of fine blooms right up to the severe frost.
ROSE, Rugosa, Single	" 27	Light red. Bloomed profusely all the season, fine showing.
ROSE, Japanese Single	" 29	Very light red. Very fine effect.

Newer Varieties of Roses

ROSE, Kaiserin Augusta Victoria		Made fine growth for first year. This did not bloom.
ROSE, Killarney	July 12	Deep shell pink. Very pretty.
ROSE, Mrs. R. G. Sherman Crawford		Set out May 22. No bloom, but made good strong growth.
ROSE, Crimson Rambler		The first season. No bloom, but fine growth.
ROSE, Lady Alice Stanley, Hybrid Tea	July 16	First season, good growth, excellent showing.
ROSE, J. B. Clarke, Hybrid Tea		First season, no bloom. Made spendid growth.
ROSE, Gold Finch, Climbing		First season, no bloom, good strong growth.

NOTE.—The roses were dug up in spring, and planted in a new, and more suitable position. Most of the varieties made fair growth, and a few of the newer roses bloomed, and were very pretty.

FRUITS

The yields from the different varieties of currants in the older plantation were only medium this season, although the berries were of a fair size, and of excellent quality. The bushes in the younger plantation produced their first crop, and while the yield was not high, the berries were large, and of a fine quality. The results obtained from the raspberry plantation were poor, owing to a fire that got beyond control and did considerable damage to the canes.

The results obtained from the small beds of mixed strawberries were very much below the average, and the fruit quite small.

The gooseberry bushes wintered badly, and killed back, so much so that many of them were pruned right down to the ground. One variety Pale Red, Ottawa, 1208, bloomed this season, and a few partly matured fruit were picked from this one bush.

The few Saskatoon berries in the ornamental plot bloomed on June 2, but were quickly taken by the birds as they ripened. Where the bushes were thicker on the prairie, a plentiful supply was obtained, as was the case also with the raspberries.

The young apple trees made very good growth during the past summer, and with no injury from any source whatsoever this winter, they may yet reach a fair size, and produce some fruit.

ORNAMENTAL SHRUBBERY

The ornamental shrubs still continue to make good growth, and many of them have reached a good size. The flowering shrubs gave a wonderful display of bloom this season with their many different colours. The following were the dates of the different varieties coming into bloom.

VARIETY TESTS—FLOWERING SHRUBS

Variety	Date of bloom	Remarks
CARAGANA ARBORESCENS	July 7	The border of the flower garden is composed of this.
CARAGANA FRUTESCENS	June 14	Both new and old plants.
CARAGANA PYGMATA	" 14	
CARAGANA GRANDIFLORA	" 10	
COTONEASTER TOMENTOSA	" 23	Very pretty bloom.
EYOMYMUS CENEARIS	July 3	
JAPANESE TREE LILAC	June 29	A mass of beautiful white blooms.
LILAC, Emile Lemoine	" 22	Very fine.
LILAC, Charles Joly	" 21	Very good.
LILAC, Madame Abell Chanteney	" 12	Excellent showing.
LILAC, Congo	" 12	Very good.
LILAC, Michel Buchner	" 21	Very fine showing.
LONICERA, Alpina	" 13	Very good showing.
LONICERA, Tartarica	" 13	Very fine.
LONICERA, Sullivantii	" 11	New shrub.
SPIRAEA, Billiardii	July 7	
SPIRAEA, Sorbifolia	June 28	
SPIRAEA, Arguta	" 20	
SPIRAEA, Media	" 4	
SPIRAEA, Oblongifolia	" 4	

NOTE.—Some of the more tender varieties of shrubs in the newer plantation showed the effect of our extreme cold weather.

CEREALS

The results obtained this season in the test of varieties were quite satisfactory. Although the spring opened somewhat later than usual, other conditions were quite favourable to good growth.

SPRING WHEAT—VARIETIES

Nine varieties of spring wheat were under test this season, each variety being sown in duplicate plots of one sixtieth of an acre. The crop preceding one of the two sets of plots consisted of roots, potatoes and corn. To these crops manure, at the rate of fifteen wagon loads per acre had been applied, but none was applied for the plots of 1923.

The land used for the second set of plots had been summer-fallowed the previous year (1922). Part of this land had been ploughed out of brome grass sod, and part had grown a crop of grain during the season of 1921. Manure had been applied at the rate of fifteen loads per acre, just previous to being ploughed in the spring of 1922 during which season this area was kept thoroughly cultivated. The seed bed was prepared in the spring with the spring-tooth and smoothing harrows. The surface was then rolled and the seeding done with a hand-seeder, the seed first being treated for smut with a solution of bluestone. The first seeding was done on May 7.

The results obtained are recorded in the following table.

SPRING WHEAT—VARIETIES

Variety	Average number of days maturing	Average height	Strength of straw on scale of 10 points.	Yield per acre	
		inches		bush.	lbs.
Bishop, Ottawa 8	111	44	6	59	30
Red Bobs	108	46	7	55	30
Marquis, Ottawa 15	110	43	5	52	30
Red Fife, Ottawa 17	111	43	5	51	00
Reward, Ottawa 928	105	46	7	43	00
Club	107	45	5	41	00
Ruby, Ottawa 623	100	43	10	39	00
Prelude, Ottawa 135	97	43	10	37	30

WINTER WHEAT—VARIETIES

The following varieties of winter wheat were sown on August 16 and August 18, 1922, viz., O.A.C. 104 and Kharkov. The germination of the seed being good in each case, the plants made sufficient growth during the autumn to afford good winter protection. The wheat suffered, to a certain extent, by the alternate freezing and thawing of April, O.A.C. 104 to the extent of 25 per cent and Kharkov 15 per cent, so that the plots were rather patchy. With the more favourable weather conditions of the spring and summer, however, the growth was rapid, producing a very rank growth of straw and a fair yield of grain of good quality. The tillering of the plants was heavy.

The land used for this experiment was timothy sod, ploughed during the later part of July, 1922, and put into good tilth by disc-harrow and smoothing-harrow. The seeding was done with hand-seeder at the rate of 1¾ bushels per acre. The O.A.C. 104 seed was obtained from the Beaverlodge Substation while that of Kharkov was bought from one of the Edmonton seedhouses and sent to Fort Vermilion by a gentleman who had visited the Station during the early summer of 1921.

Kharkov yielded at the rate of 56 bushels per acre compared with 46½ bushels obtained from O.A.C. 104. The former was slightly stronger as well as shorter in the straw than the latter.

WINTER RYE

Five varieties of winter rye were sown in uniform test plots of one-sixtieth acre on land similar to that occupied by winter wheat.

There was practically no winter or spring killing of these plots.

Seed of Dakold, Saskatoon and Mammoth White was obtained from Ottawa in 1921. Seed of Rosen was obtained from the Noble Foundation, Nobleford, Alta., in 1921, while seed of common was secured in the district, having been grown here for many years.

A large field plot of four acres of common rye was sown August 20, 1922, on land that had been summer-fallowed during the summer of 1922 and which had grown a crop of wheat the previous season. No manure was applied. This plot was pastured very closely during the autumn of 1922 by horses, cattle and sheep and showed the ill effects of this practice in the spring, the field being somewhat patchy. The after-growth being quite good, the plants reached a height of 40 inches with a 3-inch head, the straw standing fairly upright when cut on August 15. The yield from this plot was 20¼ bushels per acre, this being a fair yield from this type of land, which is sandy loam with some gravel and small stones. The crop was fully matured a number of days previous to being cut, the unfavourable weather conditions causing a delay. The yields obtained from the regular plots which were not replicated are given in the following table.

WINTER RYE YIELDS

Variety	Average height of plant	Strength of straw on scale of 10 points	Yield	
	inches		bush.	lbs.
Dakold	54	7	49	16
Saskatoon	52	7	46	4
Rosen	52	7	45	0
Mammoth	56	7	42	48
Common	49	7	41	44

VARIETIES OF OATS

Nine varieties of oats were under test this season in uniform plots of one-sixtieth of an acre. All varieties, with the exception of Eighty-Day and Daubeney, were sown in duplicate plots.

One of the two series of plots was sown on land that had grown a crop of feed-corn the previous season; the other set, along with the Eighty-Day and Daubeney, was sown on land that had been summer-fallowed the year before.

In the following table, the yields of the different varieties are given.

YIELDS OF OATS

Variety	Average number of days to mature	Average height of plant	Average strength of straw on scale of 10 points	Yield	
		inches		bush.	lbs.
Banner, Ottawa 49	104	47	10	105	00
Victory	103	51	10	103	11
Gold Rain	100	49	10	93	18
Leader	100	46	10	90	30
Liberty, Ottawa 480	103	49	10	72	12
Laurel, Ottawa 477	100	44	10	67	02
Alaska	91	45	10	54	24
*Eighty-Day, Ottawa 42	87	39	8	37	02
*Daubeney, Ottawa 47	87	35	8	33	18

* These two varieties occupied only one plot each, so cannot be compared fairly with the other sorts which occupied two plots each. Eighty-Day also suffered considerable damage from blackbirds.

VARIETIES OF BARLEY

Seven varieties of barley were under test this season, sown in uniform plots of one-sixtieth of an acre each.

The land used for this project was in roots the previous season. Fifteen wagon loads of manure per acre had been applied to the root crop but none to the barley crop. This land was ploughed in the autumn of 1922.

The seed was sown by hand-drill at the rate of 2½ to 3 bushels per acre, according to the variety and size of seed.

The plots were lightly cultivated on May 29 after a very heavy downpour of rain, this being done to break up the crust and form a mulch.

The following table gives the results obtained.

BARLEY—VARIETIES

Variety	Average number of days to mature	Average height of plant	Average strength of straw on scale of 10 points	Yield	
		inches		bush.	lbs.
Duckbill, Ottawa 57	95	40	6	78	36
Manchurian, Ottawa 50	91	44	6	75	00
O.A.C. No. 21	95	45	6	71	42
Barks	95	36	8	68	36
Hulless White	91	37	6	56	42
*Chinese, Ottawa 60	87	46	6	55	20
Albert, Ottawa 54	80	39	9	53	36

* This plot was not duplicated.

VARIETIES OF FIELD PEAS

Five varieties of field peas were under test this season, sown on one-sixtieth of an acre plots, the seed being sown at the rate of 2¼ to 3 bushels per acre according to variety and size of seed.

The land on which one series of plots was sown had grown a crop of field corn the previous season, while that for the other series had been summer-fallowed. These lands being in the best of tilth, the crops made excellent growth, the vines obtaining a goodly length, the pods a fair size, and the peas

were of very good quality, considering the length of time they lay on the ground from the dates cut until threshing took place. During this period the crops were turned a number of times to permit them drying out and prevent the moulding of the grain as part of this period was quite rainy and otherwise unfavourable.

Through the lateness of the season and owing to pressure of other autumn work, all grains from the experimental area were threshed with a power thresher which caused some difficulty in the breaking of the peas; this even happened with the concaves wide open.

Even on September 19, when threshing took place, the vines were not thoroughly dry, which added somewhat to the weight.

The following are the results obtained.

FIELD PEAS

Variety	Average number of days to mature	Average length of vine	Yield	
		inches	bush.	lbs.
Arthur, Ottawa 18	105	68	45	00
Chancellor, Ottawa 26	103	62	42	30
Alberly	106	73	40	00
Prussian Blue	104	63	39	00
Empire	104	57	34	30

SPRING RYE

One variety of spring rye was tested this season in a plot of one-sixtieth of an acre in size. A check plot of the same size was also sown.

The former plot was sown on corn land; the latter plot on summer-fallow.

The germination of the seed was good and the growth rank. The plots were badly lodged in July by heavy rains and high winds, and were a tangled mass when cut, with a heavy second growth. These conditions prolonged the ripening period considerably, it requiring 108 days to mature the crop.

The straw averaged about 50 inches in length and lodged badly. The average yield of the two plots was 43 bushels and 52 pounds.

SPELTZ

Two plots of this cereal were sown in uniform test plots of one-sixtieth of an acre. The original plot was sown on land that had grown a crop of garden vegetables the previous season and was in a high state of fertility; the duplicate plot was sown on summer-fallow. The plots were sown on May 12 and May 14 respectively.

The stooling of the plants was heavy, the stand on July 21 being very thick. On this date they were badly lodged by heavy rains and high winds from which they never recovered as they were kept beaten down by the frequent heavy rains of early August. A second growth sprang up in these plots soon after the date of their being first lodged, and when cut the second growth was quite heavy.

The first plot was cut on August 23, the length of the straw on this date being 43 inches. The grain was then in early dough with no possible chance of its reaching maturity before the first autumn frost, so the crops from both these plots were put in the silo.

The yield of fodder, weighed after being in stook 48 hours, was at the rate of 7 tons 1,840 pounds per acre.

VARIETIES OF FLAX

Two varieties of flax were tested this season in uniform test plots of one-sixtieth of an acre, viz., Premost and North Dakota wilt-resistant No. 52.

One plot was sown on land which had raised a crop of corn the previous season; the other on summer-fallow.

The dates of seeding were slightly later than usual, but with ample moisture and other favourable conditions including good germination, the growth was rapid, bringing all plots fully to maturity before any autumn frosts.

The yields obtained were quite satisfactory, Premost producing 22 bushels and 38 pounds per acre, while the North Dakota variety produced 20 bushels and 50 pounds per acre. Both sorts required 102 days to reach maturity and both were about the same height.

VARIETIES OF BUCKWHEAT

Two varieties of buckwheat, Japanese and Silverhull, were tested this season in duplicate plots of one-sixtieth of an acre each. The results were fair. The coming to maturity of the varieties helps to show that the past season was, on the whole, quite favourable and frost-free.

The original plots were sown on the vegetable land of the previous season, while the duplicate plots were sown on the summer-fallowed land of 1922. The seed was sown at the rate of one bushel per acre for both varieties.

The germination of the seed was good and the growth rapid and rank. The straw on the original plots reached a goodly length, very large and branching, and was still quite green and succulent when cut. It was not thoroughly dry when threshed on October 12. A fair percentage of the plants were still in bloom when cut on August 24, and a large percentage of immature kernels was lost in the fanning.

The yields obtained were 36 bushels 42 pounds from Silverhull, and 32 bushels 24 pounds from Japanese. Both varieties matured in 95 days and possessed about equal length and strength of straw.

FORAGE CROPS

ROOT CROPS

Apple moisture and fair precipitation throughout the growing period made the past season a very favourable one for all crop roots. These were sown following a cereal crop, the land receiving an application of 15 tons of well-rotted manure per acre which was ploughed in during the fall. Thorough cultivation in the spring gave an excellent seed bed. All varieties were tested in 1/60-acre plots.

Mangels were sown May 15 and harvested September 12. The yields obtained are given in the following table.

MANGELS

Variety	Source	Yield per acre as harvested	
		tons	lbs.
Giant Yellow Globe	Steele Briggs	36	....
Giant White Sugar	"	35	1,400
Prize Mammoth Long Red	"	34	40
Yellow Intermediate	Central Experimental Farm	33	360
Giant Yellow Oval	Steele Briggs	32	1,880
*Giant Yellow Oval	"	27	720

* Owing to poor germination of one lot sown May 15 this lot was cultivated out and Steele Briggs Giant Yellow Oval sown June 13, almost a month later than other varieties under test.

Sugar beets were sown May 15, the seed having previously been soaked for 12 hours to hasten germination. Harvesting was done September 11. The following yields were obtained.

SUGAR BEETS

Variety	Source	Yield per acre as harvested	
		tons	lbs.
Klein Wanzleben	Dominion Sugar Co.	15	480
British Columbia	"	13	1,900
Waterloo	"	13	1,000
Kitchener	"	12	900
Chatham	"	12	180
Danish Sugar	Denmark	11	980
Sugar Beet	Experimental Farm, Sidney, B.C.	10	1,420

Four varieties of field carrots were sown in test plots May 17 and when harvested September 6 gave the following yields.

FIELD CARROTS

Variety	Source	Yield per acre as harvested	
		tons	lbs.
Danvers Half Long	Wm. Rennie	21	1,860
White Belgian	K. McDonald & Sons	17	1,280
Danish Champion	Central Experimental Farm	17	20
Improved Short White	K. McDonald & Sons	15	1,500

Six varieties of swede turnips were sown May 18, the resulting crop being larger and of better quality than usual. Harvesting was conducted August 31 to September 4, the crop being largely stored for winter use. Yields obtained are shown in the table following.

SWEDE TURNIPS

Variety	Source	Yield per acre as harvested	
		tons	lbs.
Ditmars	McNutt, Nova Scotia	42	1,140
Canadian Gem	Steele Briggs	36	1,680
Bangholm	Experimental Farm, Charlottetown	35	800
Jumbo	Steele Briggs	33	1,200
Hazard's Improved	"	31	40
Good Luck	"	28	100

Fall turnips were tested on summer-fallow land which had received an application of 15 tons manure per acre previous to ploughing in 1922. Seed was sown in drills 24 inches apart on May 19. The crop as harvested was utilized immediately as feed for stock. The following table gives yields obtained.

FALL TURNIPS

Variety	Source	Date harvested	Yield per acre as harvested	
			tons	lbs.
Flat Norfolk	Wm. Ewing	Aug. 31	23	1,460
Early Six Weeks	Sutton's England	" 21	22	1,600
Red Paragon	"	" 24	19	1,000
Green Top	"	" 20	16	1,600
Pomeranium White Globe	"	" 22	16	100
Purple Top Mammoth		" 11	14	620

ENSILAGE CROPS

CORN FOR ENSILAGE

Ten varieties of corn were tested in one-sixtieth-acre plots. The land had been in cereals the previous year and received an application of 20 tons manure per acre. Left in this condition the land readily caught the snow and held it during the winter. Preparation for seeding was done in the spring with disc, spring-tooth and smoothing harrows, the manure being thoroughly incorporated with the soil. Seeding was done May 16 to May 18 in hills 3 feet apart and at a rate of 13 pounds per acre. Wire worms greatly impaired the stand, in some cases fully 50 per cent being destroyed. When harvested, the corn was put immediately into the silo. The following table gives records of corn varieties under test which were harvested August 31.

CORN

Variety	Maturity when cut	Height	% Stand	Green yield per acre	
		inches		tons	lbs.
Compton's Early	Tassel	61	90	17	560
North Dakota	Silk	71	75	17	320
Wisconsin No. 7	Not tasselled	59	75	15	1,200
North Western Dent	Not silked	69	55	13	520
White Cap Yellow Dent	Tassel	61	60	12	1,200
Bailey	Cobs forming	60	50	9	1,800
Improved Leaming	Tassel	59	50	9	1,800
Canada Yellow	Cobs formed	55	50	9	900
Longfellow	Not tasselled	48	50	9	240
Quebec 28	Silk	60	35	6	1,260

Compton's Early gave slightly the heaviest green yield and made the best quality ensilage.

Three plots of mixed corn were sown May 18 in one-fortieth-acre plots in drills 28 inches, 30 inches and 34 inches apart. Sown at about 22 pounds per acre the resulting stands were thick and wire worm damage less noticeable than in the hill seeding and a fair stand was obtained in all cases. The table following gives yields obtained when harvested August 30.

Sown in drills	Maturity when cut	Average height	% Stand	Green yield per acre	
		inches		tons	lbs.
28 inches apart	Tassel	46	75	14	800
30 inches apart	Silk—some cobs	86	85	15	1,280
34 inches apart	Tassel—silk	72	100	21	240

SUNFLOWERS

The season of 1923 was favourable for the production of good crops of sunflowers. Germination was good and no frost occurred after the emergence of the crop. June was moderately dry but a fair supply of moisture was available during July and August. Yields were good and this crop shows promise of becoming of importance to the live stock industry in this section. This season all varieties were sown in one-thirtieth-acre plots and the material when cut hauled directly to the silo and mixed in with other crops when being put in for ensilage. The following table gives data recorded from sunflower tests this season.

SUNFLOWERS

Variety	Source	Date sown	Sown in drills	Date cut	Height	Maturity when cut	Green yield per acre
					inches		tons lbs.
Mennonite.....	Rosthern.....	May 14	20 in. apart..	Aug. 30	84	Full bloom.....	40 1,600
"	"	" 15	22 " ..	" 31	90	25% bloom.....	40 40
Ottawa 76.....	Central Experimental Farm.	" 10	24 " ..	" 30	92	Seed in soft dough.	36
"	" "	" 14	28 " ..	" 30	93	75% seed in milk.	39 300
"	" "	" 10	30 " ..	" 30	84	Seed in early dough.	31 400
"	" "	" 10	34 " ..	" 30	82	Seed in early milk.	30 480
Mammoth Russian	K. McDonald...	" 14	36 " ..	" 30	86	Starting bloom.	28 760
" " ..	"	.....	40 " ..	" 30	72	No bloom.....	27 120
" " ..	D.I.S. Co.....	May 15	42 " ..	" 30	84	"	27 990
" " ..	"	" 16	44 " ..	" 30	70	Seed late dough	26 1,820

GRAIN MIXTURES AS ENSILAGE CROPS

The following grain mixtures were tested this season. The land used for these experiments had grown a crop of potatoes the previous season, and had been brought up to a high state of fertility by frequent applications of barnyard manure. With the ample moisture in the soil at the time of seeding, germination of these crops was timely, and with after-conditions favourable, the growth was rapid, and in most cases quite rank when cut. These crops were used in the filling of the trench silo, along with the other fodder crops (corn, and sunflowers). When any of these mixtures showed an advanced stage of maturity, water was added, when cutting for the silo. When the silo was opened on December 12, 1923, the silage was found to be of the finest quality, and was greatly relished by all classes of stock. As this was the first time that the stock at this Station had been presented with this class of fodder, the eagerness with which they took to it and the results that have, and are being obtained, warrants us in considering this new venture a decided success. Crops can now be utilized, and turned into palatable fodder, that in the past were almost worthless.

The following were the mixtures tested; in each case seeding was done May 21 in one-thirtieth-acre plots.

GRAIN MIXTURES FOR ENSILAGE

Mixture	Rate of seeding per acre	Date cut	Average height	Maturity when cut	Yield of material 48 hours after cutting
	bush.		inches		tons lbs.
Banner Oats	2	Aug. 22	47	Firm dough	6 1,920
Arthur Peas	1			Pods formed	
Victory Oats	1½	Aug. 22	48	Late milk	7
Empire Peas	¾			Well formed	
Success Barley	1			Changing colour.	
Champion Barley	2¼	Aug. 23	43	Firm dough	8 1,280
Alberty Peas	1		49	Firm dough	
Spring Rye	1	Aug. 21	36	Early dough	6 1,800
Alberty Peas	1		46	Well advanced	
Hulless White Barley	1		38	Firm dough	
Oats (late varieties mixed)	3	Aug. 22	50	Milk	8
Success Barley	1	Aug. 21	39	Firm dough	4 1,000
Champion Barley	1			50% mature	
Hulless White	1			Late milk	
Prussian Blue Peas	¾	Aug. 22	34	Mature	3 1,830
Alberty Peas	¾			50% mature	
Empire Pea	¾			25% mature	
Marquis Wheat	¼	Aug. 22	46	Firm dough	7 40
Banner Oats	¼			Late milk	
Rye	¼			Soft dough	
Arthur Peas	1			20% mature	
Champion Barley	½			50% mature	
Banner Oats	2	Aug. 30	40	Late dough	5 1,440*
Arthur Peas	1			Late dough	

*Weight immediately after cutting.

ANNUAL HAY CROPS

A number of annual hay crops were sown in test plots on May 23. Seeding was done in drills at a rate of 12 pounds per acre. The land used was summer-fallow the previous year after receiving an applicatoin of 20 tons manure per acre and had been well cultivated during 1922. A good seed bed was obtained in the spring by use of the springtooth and smoothing harrow, and with the ample moisture in the soil, germination was good. The growing period was favourable and comparatively heavy yields obtained. The yields given in the following table were taken 48 hours after cutting, at this time the material was still quite creen. All were cut August 22.

ANNUAL HAY CROPS

Seeding	Height	Yield per acre 48 hours after cutting		Remarks
	inches	tons	lbs.	
Common Millet	45	8	1,250	Well headed, leafy.
Hungarian Millet	43	9	1,440	Excellent stand. Headed. Very leafy.
Japanese Millet	36	6	1,800	Not headed. Large and leafy.
Sudan Grass	38	7	1,360	Blooming. Leafy.
Canary Grass	38	8	1,280	Headed and well advanced.

A plot of Improved Dwarf Essex Rape was also sown on May 19. This made good growth reaching an average height of 36 inches. No weights were taken from this plot as the material was cut during the summer as required and fed to hogs.

HAY AND PASTURE MIXTURES

With the object in view of determing the suitability of various grasses, clovers and alfalfa, seedings have been made for some years to these crops alone and in different combinations. These grass, clover and alfalfa plots have aroused great interest on the part of visitors, particularly practical dairymen.

The extraordinary productiveness more especially of alfalfa and timothy has been much commented on as indicating a source of palatable and nutritious hay now that increasing settlement is curtailing the area available for wild hay. Stockmen are being forced to give hay production serious consideration and have shown great interest and appreciation in the work being carried out at this Station.

This season is the third that crops have been taken from some of the hay and pasture mixtures and the following table gives clear indication of the continued cropping possibilities particularly from alfalfa. Red clover, except for natural reseeding, has disappeared from mixtures but alfalfa is still producing excellent crops the fourth year after seeding. The first cutting was made in all cases on July 10. The material was cured 72 hours before weighing up, and by that time it was in excellent condition for stacking.

The late summer rain greatly improved the second growth, especially alfalfa A second cut of plots containing alfalfa was made August 28, the material being weighed green and immediately put into the silo. Other plots made an excellent second growth but not sufficient to warrant cutting. This material furnished abundant pasture.

HAY AND PASTURE MIXTURES

Mixture Sown	Per cent of grasses and clovers in crops harvested	Yield first cut. Weights taken after 72 hours' curing		Yield second cut. Weights taken green	
		tons	lbs.	tons	lbs.
Alfalfa	Good stand alfalfa	3	528	1	1,200
Alfalfa Timothy	50% alfalfa 50% timothy	2	648	1	400
Alfalfa Western rye	25% alfalfa 75% western rye	2	1,384	1	400
Alfalfa Meadow fescue	75% alfalfa 25% meadow fescue	2	920	..	1,800
Alfalfa Timothy Western rye Meadow fescue	50% alfalfa 25% timothy 15% western rye 10% meadow fescue	2	320	..	1,760
Alfalfa Timothy Western rye Meadow fescue Red top Kentucky Blue grass	50% alfalfa 25% timothy 10% western rye 5% meadow fescue 5% Red top 5% Kentucky Blue grass	2	780	1	280
Red clover	10% red clover 90% volunteer crop and weeds	1	960		

HAY AND PASTURE MIXTURES—*Concluded*

Mixture Sown	Per cent of grasses and clovers in crops harvested	Yield first cut. Weights taken after 72 hours' curing		Yield second cut. Weights taken green	
		tons	lbs.	tons	lbs.
Red clover					
Timothy	Timothy 100%	2	560		
Red clover					
Western rye	Western rye 100%	2	960		
Red clover					
Meadow fescue	Meadow fescue 100%	1	1,840		
Red clover					
Timothy	50% timothy	2	992		
Western rye	25% western rye				
Kentucky Blue	5% Kentucky Blue				
Red top	5% red top				
Meadow fescue	15% meadow fescue				
Red clover					
Timothy	75% timothy	2	672		
Western rye	15% western rye				
Meadow fescue	10% meadow fescue				
Red clover	80% red clover	2	160		
Alsike	20% alsike				
Red clover	5% red clover	3	336		
Alsike	5% alsike				
Timothy	90% timothy				
Red clover	20% red clover	3	720		
Alsike	5% alsike				
Western rye	75% western rye				
Red clover	10% red clover	2	1,120		
Alsike	5% alsike				
Meadow fescue	85% meadow fescue				
Red clover		1	1,184		
Alsike	5% alsike				
Timothy	50% timothy				
Western rye	25% western rye				
Meadow fescue	20% meadow fescue				
Red clover		1	1,040		
Alsike					
Timothy	25% timothy				
Western rye	25% western rye				
Meadow fescue	20% meadow fescue				
Kentucky Blue	15% Kentucky Blue				
Red top	15% red top				

NOTE.—In addition crops were taken from other plots of alfalfa and grasses. The first cut from these was made July 10. The second was made August 30. The material from the first cut was cured 72 hours before weighing, the second cut being weighed green and utilized for silo filling.

Alfalfa		5	1,220	2	1,000
Timothy					
Alfalfa (Grimm)		4	40	2	500
Timothy		2	260		
Brome grass		3	260		
Western rye		2	860		
Alsike		1	310		
White Dutch clover		1	220		
Meadow fescue		1	40		
Kentucky Blue		1	1,780		
Red top		1	1,630		

THE BEES

This season's results from the bees furnished further proof that the possibilities of profitable honey production in this Northland are not very promising, as the honey-gathering period is so very short, and the winters long and severe. As the bees have to be confined to their winter quarters for such a long period, wintering is the most serious problem. The weather conditions throughout the whole of the past season were very unfavourable from a beekeeper's point of view, and considerable feeding had to be done. On September 20 and 21, examination of the two colonies found them almost destitute of food, and on September 21 artificial feeding was started. Syrup was made with two parts of granulated sugar, to one part of water. Feeding was continued until October 29, on which date the hives were weighed, and placed in the cellar, as the weather was then quite cold, 25 degrees of frost being recorded. The weights on this date were, No. 1, 67 pounds without cover, and No. 3, 62 pounds without cover. No. 2 colony was found dead when examined on September 21. When placing the hives in the cellar this autumn, an empty super was placed on the hive, with the cover on top of the super, as it was thought that the extra space might prevent moisture gathering in the hives.

The season was found to have been the most unprofitable one since beekeeping was started at this Station, but without a doubt these conditions will change whenever this Station, and the farmers in the close vicinity, are raising more alfalfa, and clovers. At present the only alfalfa, and clovers grown in this district, are the few small plots at this Station, which coming into bloom are then quickly cut down as fodder, so that little or no honey is gathered from this source. No final conclusions can be drawn from this season's results.

NEW BUILDINGS AND IMPROVEMENTS

The assistant's house was added to. The large log barn was completed during the season, and is now being used as a horse barn the large loft will be used as a storage of summer feed, for the horses that are used for the experimental work during the summer months. A new granary of hewn logs, 24 feet by 26 feet with an addition 12 feet by 16 feet as an engine room, was built this season. The grain crusher was placed in the granary, the belt running from the engine room to the crusher. A new log poultry house was built 16 feet by 24 feet of hewn logs and plank corners and the roof covered with ready roofing. This is being used this winter to house the turkeys, but will be used during the spring as a setting place, and to house the young chicks during the summer. A run will be added in the spring.

A trench silo 26 feet by 10 feet was dug by the staff during any slack period. A very light building 30 feet by 14 feet for a cover, was erected over the trench. The trench was lined with common lumber and the sides of this low building were covered with one ply of common 1-inch material placed upright. The roof was also covered with 1-inch lumber, and ready roofing placed over the lumber. This light building was erected to prevent, if possible, the late autumn rains and early winter snow from falling directly into the trench, and creating more moisture than is needed, and also to retain some heat during the extremely cold periods that are experienced in this Northland. This was one of the problems that was carefully considered before the enterprise was started, as it was feared a solid frozen mass might otherwise have been encountered when the silo was opened, which would have been difficult to handle.

SALMON ARM, B.C.

REPORT OF THE SUPERINTENDENT THOS. A. SHARPE

The winter of 1922-23 was not severe nor were there any storms of note, but the spring was late. Although the snow went off early, the weather was cold and growth was very slow. Seeds, especially of roots and vegetables, were late in germinating and made but little progress until the season was well advanced. There was more rain in the growing season than is usually the case, but as the soil was comparatively dry when spring opened, the showers did not penetrate far into the ground and root crops and potatoes were below the average in yield. The quality, however, was good.

Fall wheat and oats are the principal grains grown in this valley, and these with the hay were a good average crop. Fruit was good, especially apples, but the returns from these have not been satisfactory.

After extended experiments, it is believed that this Station has succeeded in locating a soy bean which will produce a crop of ripe beans. A portion of the crop at the Station is being distributed to orchardists on the benches, in the hope that, on account of its vigorous growth and nitrogen-gathering properties, it will prove to be a valuable crop to turn under to supply the nitrates and humus that these lands greatly need.

METEOROLOGICAL RECORDS

—	Maximum	Date	Minimum	Date	Rain	Snow	Hours sunshine
1923	°F.		°F.				
April	81	17	23	7	0·8	.....	236
May	77	7 & 21	29	2	2·08	.....	200
June	89	30	41	26	5·02	.....	212
July	94	23 & 28	47	18	0·77	.....	320
August	90	30	41	1	1·28	.....	276
September	85	8	33	22	0·78	.....	234
October	75	2	23	29 & 31	1·0	.....	141
November	56	3	24	21	0·87	7·25	43
December	47	6	−5	30	0·50	28·5	37
1924							
January	42	29 & 31	−16	1	0·86	20·0	46
February	51	26	23	20	0·83	1·5	94
March	58	5	16	30	0·11	1·5	134

BETSIAMITES

The season of 1923 was again rather unsuccessful. At the outset there was much drought and as early as August 20, heavy frost ruined what little vegetation remained, except a few plots of Banner, Alaska and Liberty oats. Among the hoed crops, turnips were harvested weighing three pounds, carrots four and one-half ounces, and table beets of the same weight. Garden peas yielded but poorly, and beans were a failure. Further experiments will be conducted next year.

SWEDE CREEK, YUKON TERRITORY

REPORT OF THE SUPERINTENDENT JAMES R. FARR

The season 1923 opened early. On May 5 test plots were seeded and field tests were seeded on May 9. After this date there were three nights only in May showing frost, viz: May 10, 1°, May 18, 2°, May 24, 1°. Then followed 108 days without frost, which is the longest period without frost recorded in the Yukon.

The precipitation immediately following seeding was very light. As previous years have shown that this condition is not exceptional, it is very important to have the soil in the best possible state to retain moisture.

In improving the soil in the Yukon, we meet conditions differing greatly to those of the southern parts of the Dominion. One instance is the exceedingly short northern summer and period when the ground is not frozen. It is only during this time that soil can be improved by ploughing under green manure or cultivating. In many instances, crops ploughed under for green manure have frozen a few days afterwards, to remain frozen until the following spring; before the land received any benefit, the growing season had passed. It really requires two seasons in the Yukon to improve soil that would require but one year's treatment in the southern, or warmer parts of the Dominion.

In improving virgin soil, rye, buckwheat, and sweet clover are grown and ploughed under for green manure. The growth from these is generally poor. This planting is followed by a crop of oats, peas, and clover. The oats and peas are cut for hay and the clover is expected to be ploughed under the following fall; but in every known case, this clover has been so nearly winter killed, that there has been practically nothing to plough under. This condition has been ameliorated to some extent by reseeding in the spring, the seed being worked in with a disc harrow, but although this practice has helped give a small growth of clover, it is not nearly so efficient as a crop seeded early on land that has been fall ploughed. There is therefore little green manure for the fourth year's hoed crop, and barnyard manure is not plentiful, as very little stock is kept.

After the land has received this treatment, it is subjected to a three-year rotation. The first year is a hoed crop; second year, grain seeded to clover; third year hay, with the aftermath ploughed under. Since the clover does not withstand the winter, and there is no crop the third year, it will be substituted by buckwheat to be ploughed under and summer-fallowed.

The following Meteorological records for 1923 give temperature, precipitation, and sunshine.

Months	Temperature ° F.				Precipitation inches			Sunshine	
	Max.	Date	Min.	Date	Rain	Snow	Total	Hrs.	Min.
January	1	25	−53	28	.....	10	1·00	1	54
February	37	10	−52	15	.....	17	1·70	47	24
March	30	31	−38	12	.....	9·75	0·975	158	24
April	51	24	−13	1	0·19	0·19	0·19	203	36
May	70	16	11	3	0·64	.....	0·64	286	6
June	86	9	34	4	1·45	.....	1·45	281	6
July	86	27	39	16	0·52	.....	0·52	287	12
August	84	2	38	30	0·40	.....	0·40	250	24
September	65	4	22	24	2·03	.....	2·03	94	42
October	65	5	6	30	0·43	.....	0·43	82	6
November	37	15	−35	30	0·05	4·25	0·47	6	6
December	7	21	−49	29	.....	11·0	1·10	–	–

CEREALS

The growth of the different varieties of wheat depends largely on soil conditions. If the ground is low, bottom land, in a more or less damp condition, which retards maturity, the Prelude is the most dependable as it is the earliest and has ripened on a location of this description ten years in succession. Should the land be higher and dry, a later variety will mature.

The following table will show plot tests of different varieties on bottom and bench land, a plot being 1/40 acre, seeded at the rate of 100 pounds per acre.

WHEAT VARIETY TEST

Name of Variety	Date seeded	Harvested	Soil	Yield	
				bush.	lbs.
Prelude, Ottawa 135	May 5	Aug. 4	Bottom	35	20
Prelude, Ottawa 135	" 9	" 4	Bench	24	..
Ruby, Ottawa 623	" 5	" 4	Bottom	34	..
Ruby, Ottawa 623	" 9	" 4	Bench	27	20
Marquis, Ottawa 15	" 5	" 8	Bottom	32	..
Marquis, Ottawa 15	" 9	" 4	Bench	28	..
Red Bobs	" 5	" 7	Bottom	30	40
Supreme	" 9	" 4	Bench	33	20

It is not advisable to depend entirely on locally grown seed, as in some seasons it is slightly frosted before being harvested. This seed is slow in germinating, and of course makes late harvesting.

The following table gives field wheat tests.

Variety	Seeded	Harvested	Acres	Seeding rate		Yield per acre	
				bush.	pks.	bush.	lbs.
Marquis	May 9	Aug. 7	1	1	3	30	4
Prelude	" 9	July 27	½	1	3	13	36

Both of these varieties of wheat were sown on bench ground. Native-grown bearded, and beardless, barley is equal to the imported seed. The native is entirely free from smut, whereas the imported should always be treated for smut.

The following plots one-fortieth acre each were seeded with barley.

BARLEY VARIETIES

Name of Variety	Seeded	Harvested	Soil	Yield	
				bush.	lbs.
Chinese, Ottawa 60	May 9	July 27	Bench	43	16
Chinese, Ottawa 60	" 9	" 27	Bottom	54	18
Himalayan, Ottawa 59	" 9	" 27	Bench	41	20
Himalayan, Ottawa 59	" 9	" 27	Bottom	36	..

On May 9, three-quarters acre of white, hulless barley was seeded, this was cut on July 28 and yielded 19 bushels. The growth of this variety was good, but it shelled out badly after being cut.

FIELD OATS—VARIETIES

Name of Variety	Seeded	Harvested	Acres	Yield	
				bush.	lbs.
Victory	May 12	Aug. 8	1	44	2
Banner	" 12	" 8	1	50	4

Two acres sown with oats and peas for hay gave a very heavy growth, and yielded five tons of cured hay.

One-half acre of Canadian Beauty field peas was sown on May 10. The growth was poor; the yield 7 bushels.

CORN, SUNFLOWERS, CLOVER AND GRASSES

The 4½ acres which last year were sown on May 10 with a mixture of alsike, red clover, and timothy; the timothy only withstood the winter, the clovers being completely winter killed.

The 3½ acres sown last year on May 15 with a mixture of clovers were entirely winter killed. Both these areas were reseeded with alsike and red clover. The 4½ acre area yielded ½ ton per acre. The 3½ acre area yielded practically nothing. One and one half acres of this was ploughed under with the crop as it was cut; the remaining two acres were left for another winter trial, to be ploughed in the spring if the plants failed to withstand the winter.

One acre of timothy seeded in 1921 was cut for hay but yielded only one half ton of cured hay.

Small areas of sweet clover (white blossom) late Swedish, alsike and red clover, were sown on bottom land on May 26. All gave a heavy growth. All these clovers make excellent green feed the same season as sown, if grown on bottom land, but are rather late for hay, as the wet season generally starts before they are ready to cut.

On May 17 sunflowers and corn were planted. The sunflowers grew well reaching a height of over six feet and yielded 24 tons per acre.

The corn did not grow well and was not worth harvesting. One small plot of Hubam, an annual sweet clover grown on bottom land, and sown late in May, was allowed to go to seed. The growth was very heavy, and it attained a height of seven feet and two inches in 87 days.

A small quantity of seed was taken from a plot of alfalfa. This is the first time alfalfa seed has matured here.

Two acres sown with oats and peas, which were cut for hay gave a yield of five tons. No clover was sown in this. One half acre of this area was ploughed and sown with red clover at a late date so that the seed did not germinate before the ground was frozen. The remaining 1½ acres will be seeded in the spring.

ROOT CROPS

Field carrots and mangels were seeded May 14 on land which the previous season had grown clover, which had been ploughed under for green manure.

The following varieties of turnips were seeded May 15. Purple Top Pomeranian, Aberdeen Yellow Purple Top, Bort Felder, Devonshire Greystone, Purple Top Mammoth, or Improved Greystone, Yellow Lanlsard, Osternsunden, Danish Queen Swedish, Monarch Swedish.

All turnips except the Danish Queen and Monarch were attacked by "lady bugs." A portion of this crop was saved by spraying with white hellebore, but the yield was poor. The Danish Queen and Monarch yielded six tons per acre.

The field carrots and mangels grew poorly except on low ground where the growth was fair.

The following varieties of potatoes were planted May 16 with barnyard manure.

Name of Variety	Top dressed — Pounds per acre	Manure in drills — Pounds per acre	Without manure — Pounds per acre
Sussex Rose	23,320	26,235	16,907
Agassiz Special	22,737	24,486	18,656
Early Ohio	.....	.....	9,328
Early Rose	.....	.....	9,911

These were all harvested on September 8.

Garden peas were seeded May 6. Thomas Laxton gave a wonderful growth being ready for table use on July 20.

Table carrots were seeded May 6, varieties Oxheart, Chantenay 0-2011. The Oxheart were ready for table use on August 1; the Chantenay were later, but the growth was good.

Onions seeded May 6. Large Red Wethersfield, Graham, Extra Early Red Flat. Yellow Globe Danvers. The growth of these was good, the Extra Early Red Flat were ready on August 1.

Carrots seeded May 26. Chantenay 0-211, Chantenay 0-2069, Chantenay Half Long, Oxheart. These all gave a good yield.

Beans seeded May 26. Masterpiece 0-211, Stringless Green Podd 0-2747, Round Pod Kidney Wax 0-1638. The Masterpiece, and Round Pod Kidney Wax were ready on August 5. The Stringless green Pod, was ready on August 9. The Masterpiece and Stringless green pod gave a wonderful growth, and some of the pods matured.

Beets seeded May 26. Egyptian Turnip, Detroit Dark Red turnip, Extra Early Egyptian. These were fit for use on August 10 but the yield was small.

Parsnips seeded May 26. Hollow Crown. These did not grow well. The yield was poor.

Garden corn planted May 26. This seemed to be a dwarf variety, the tallest stalk grew 2 feet 9 inches. Early in July, ears developed, but none of them filled. They were no further advanced at the end September, than in the middle of July.

The following varieties of cabbage were transplanted on May 29.

Name of Variety	Ready for use	Weight per head
		lbs.
Copenhagen Market	Aug. 6....	16 to 20
Jersey Wakefield	" 6....	8
Early Express	July 29....	2 to 4
Danish Ballhead	Sept. 1....	5 to 8

The Early Express will break open if it is not cut early. The Copenhagen Market grew very large and is a fair keeper recommended for general use. The Danish Ballhead is the better keeper.

Three varieties of cauliflower were transplanted on June 1; Early Snowball. Extra Early Dwarf Erfurt and Early Snowflake. The Early Snowball and Extra Early Dwarf Erfurt were ready for use on August 4. The Early Snowflake was ready on August 11.

FORT SMITH, N.W.T.

The year 1923 was not very favourable to cultural experiments. The spring was particularly dry and all seeding suffered from this unusual drought. However, all seeding operations were performed at the usual time: wheat, oats and vegetables about May 10 and potatoes around May 24. The moisture left by the melting snows was sufficient to produce the first plant germination. A light rain which fell early in June, but only in the vicinity of Fort Smith, stimulated the germination begun under good auguries. West of Fort Smith, around the Mission farm, the rain was totally lacking, so that in August all our seedings were barely above ground.

Owing to the light rain of the spring, the experiments gave fair results at Fort Smith, yet much below the average. Twenty miles to the west, on the St. Bruno farm, the results were nearly nil. The 48 bushels of oats sown brought barely 210 bushels; the two bushels of wheat yielded 8 bushels only. Potatoes gave but two bags to one sown. The other vegetables barely germinated, except red and white carrots, which gave an insignificant yield. Failure was therefore complete in that region, a regular occurrence each three or four years.

In the Fort Smith district, still the most favoured here, results were such as to render the work profitable. We sowed 150 pounds of wheat and harvested 1,320 pounds. Potatoes yielded ten bags to each one planted. Red and white carrots gave the same abundant crop as in previous years. A small field under one-fifth of an acre yielded 130 bags of Short Improved white carrots, of which a few specimens weighed 3 pounds. We obtained cabbages weighing 20 pounds.

Our hay seedings did not succeed as in previous years: the hay remained very short and thin.

These poor results during the spring and summer of 1923 are due only to the unfavourable season which prevailed similarly all over the North.

FORT RESOLUTION, N.W.T.

The most important thing to report this year concerning our experiments, is the complete failure of crops specially cereals and potatoes. This is not due to the soil which, although not rich, is quite suitable for cultivation, as proved by the experiments of the last few years. Our failure comes from the season, which was unfavourable from beginning to end. Winter was not very severe, but it held out despairingly. There was much snow and at mid-May, our fields were still covered with it; it only disappeared totally about May 20. The season was therefore twelve to fifteen days late, in comparison with the previous years. Our seedings were begun on May 22 and extended to June 12, in unfavourable conditions of cold and moisture. The remainder of June was a little better. July was warm but very dry and there was not a drop of rain until about the end of the month. There was then a period of cold and wind, with frequent showers which disturbed haying operations but were not heavy enough for our crops.

August, usually so fine, was like a fall month, and on August 14, a heavy white frost covered the soil; our crops, already very late, were all much injured, especially the potatoes. Fine weather succeeded and prevailed until the end of October, but nothing grew much during that period, except the oats sown for green feed. Marquis wheat, White Banner oats, and Ottawa 480 Liberty hulless oats, with which we had conducted successive and very encouraging experiments during the last two years, yielded nothing worth while as grain.

Potatoes were dug up about the end of September; the yield was slightly above what had been sown, but not in all the fields. We obtained 179 bags, from 100 bags sown. We are thus very far from our previous crop.

The only crop which was at all satisfactory this year was oats sown for green feed. Our cultivated meadows yielded about ¾ ton of hay per acre; we thus harvested about half of the feed required for our twenty head of cattle; we got the remainder at a distance of 60 miles from here on the Great Slave river, where we have magnificent natural meadows.

On the whole, the season was unfavourable and the yields obtained nearly nil, excepting a few varieties of vegetables. The table of yields shows that in spite of all, many kinds gave some satisfaction.

DATES, OF SOWINGS AND YIELDS

Variety	Quantity	Date of sowing	Date of germination	Ready to use	Results
1 Oats—White Banner	40 lbs.	May 22	June 4	Frost	Nothing
2 Oats—Marquis Wheat	40 lbs.	" 22	" 4	"	"
3 Carrot—Early Gem	3½ ozs.	" 22	" 9	Aug. 10	Good
4 Carrot—Chantenay Half Long	2 ozs.	" 21	" 6	" 10	"
5 Beet—Red	4 rows	" 23	" 6	" 3	"
6 Beet—Detroit Dark Red	3 "	" 23	" 6	" 10	"
7 Carrot—White Belgian	3 "	" 23	" 6	" 3	"
8 Turnip—Rutabaga	3 "	" 25	" 7	" 1	"
9 Turnip—Purple Top	3 "	" 25	" 4	" 1	"
10 Peas—Gregory Surprise	4 "	June 9	" 19	" 5	Fair
11 Peas—Thomas Laxton	4 "	" 9	" 19	" 5	"
12 Onion—Yellow Globe	4 "	" 9			Nothing
13 Peas—English Wonders	4 "	" 9	June 26	Aug.	Fair
14 Onion—Select Large Red Wethersfield.	4 "	" 9	" 26		Nothing
15 Beans—May Queen	4 "	" 9	" 21		"
16 Parsnip—Hollow Crown	4 "	" 9			"
17 Corn—Pickaninny	4 "	" 9			"
18 Corn—Early Malcolm	4 "	" 9			"
19 Oats—Feed		" 11	June 19	Oct.	Fair
20 Pumpkin	4 rows	" 11	" 19		Nothing
21 Radish	4 "	" 9	" 13	July 22	Good
22 Lettuce	4 "	" 9	" 17	" 28	"
23 Hulless Oats—Liberty, Ottawa 480		" 9	" 20	Frost	Nothing
24 Cauliflower		May 10	May 18	Sept. 18	Good
25 Jersey Wakefield	4 rows	" 10	" 18	" 10	Fair
26 Copenhagen	4 "	" 10	" 18	" 10	"

N.B. The last three were sown in hotbeds.

FLOWERS

The flowers on our grounds, although less beautiful than in previous years, succeeded fairly well. Travellers are agreeably surprised, more so as they do not expect to find here flowers so beautiful and varied and in such quantity.

Following is a list of the various kinds of flowers grown here this summer. None of the nine different kinds of gladioli planted, (and all of which bloomed last year), succeeded this year. The listed plants, started in hotbeds on April 20, were transplanted outside between June 15 and 20.

LIST OF FLOWERS AND TIME OF BLOOMING

Sweet William	Bloomed in June	
Baby's Breath	"	"
Geraniums	"	"
Laverets	"	July
Poppy	"	"
Matricaria (white)	"	"
Excelsior	"	"
Pinks (Dianthus)	"	"
Daisy	"	"
Little Dorrit	"	August
Mignonette	"	"
Mangold	"	"
Pansy	"	"
Balsams	"	"
Verbenas	"	"
Sweet Peas	"	"
Snap Dragon	"	"
Little Blue Star	"	September
Morning Glory	"	"
Dahlia	"	"
Chrysanthemum (Snow balls)	"	"
Zinnias (all colours)	"	"
Carnations (Marguerite)	"	"

N.B.—Phlox, Digitalis and Petunias did not bloom.

OBSERVATIONS ON WINTER'S BREAK-UP

April 5. Snowbirds.
" 17. Willows in bloom.
" 25. First starlings.
" 26. Ducks and geese.
" 31. Gulls.
May 10. Petite Rivière au Bœuf in motion.
" 17. Water in bays.
" 17. Dog sleds still coming in from Hay River.
" 19. Croaking of frogs.
" 24. Great Slave river in motion.
June 15. Bays covered with floating ice.
" 20. Ice can still be seen in the distance on the lake.

METEOROLOGICAL RECORDS

——	Maximum	Minimum	Snow	Rain	Melted snow
	° F.	° F.	inches		
December, 1922	− 8	−12	5	.....	.....
January, 1923	−16	−24	10	.....	.....
February, 1923	− 8	−21	4	.....	.....
March, 1923	−10	−20	6	.....	.....
April, 1923	22	−17	6	.....	0·39
May, 1923	37	28	.....	0·58	0·13
June, 1923	63	46	.....	0·34	.....
July, 1923	68	50	.....	0·56	.....
August, 1923	65	46	.....	0·71	.....
September, 1923	53	40	.....	1·08	.....
October, 1923	47	34	.....	0·73	.....
November, 1923	23	14	2	.....	.....

FORT PROVIDENCE, N.W.T.

The summer of 1923 was not a success for our different plantations. The principal cause which paralyzed growth was the drought which extended practically over the whole summer.

Barley, oats and wheat yielded about the same quantity as sown, so there was no profit.

Potatoes, generally abundant here, failed to grow. In the area which used to give us 800 and even 1,000 bags, we obtained hardly 200 bags. (In the summer of 1922, the crop was also poor, but then it was due to incessant rains; the potato yield in that year was 300 bags).

Last summer, for our 25 head of cattle, we gathered 32 racks of hay.

TOTAL PRODUCE HARVESTED (1923)

Potatoes	200 bags
Cabbages	750 heads
Cauliflowers	300 "
Lettuce	450 "
Carrots	16 bush.
Turnips	25 "
Beets	25 "
Butter beans	3 pecks
Peas	3 "
Radishes	220 bunches
Onions	14 bush.

We hope that the summer of 1924 will be more favourable to our plantations. The land has received the necessary fertilizer and ploughing will be undertaken as soon as the frost is out of the soil.

NOTES OF GARDEN CROPS

Cabbage and cauliflower were sown in hotbeds the last week of April; were out of the ground ten days later; transplanted in the third week of May; and were ready for the table in the second week of August.

Carrots were sown in the third week of May; above ground fifteen to twenty days later (seeds were sprouted before sowing); ready for use the middle of July.

Turnips were sown the third week of May; above ground fifteen days later; ready for use early in September.

Beets were sown the third week of May; above ground twelve days later; ready for use in the middle of August.

Lettuce was sown in hotbeds the last week of April; above ground eight days later; ready for use the last week of May.

Peas were sown the fourth week of May; above ground six or eight days later; ready for use about the middle of July.

Beans were sown the fourth week of May; above ground eight days later; ready for use first week of August.

Radishes were sown in hotbeds and open ground. Those in hotbeds were up six days later and ready for use within three weeks. Those sown in the open were up eight days after sowing and also ready for the table in three weeks.

Onions were sown in hotbeds the third week of April; above ground twelve days later; transplanted the second week of June; ripened in September.